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AN+AI change telecoms' future

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MEET THE AUTHOR

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Sue has been a technology and business journalist for 35 years, She started on *Computergram International* (which became *Computerwire*), between 1990-1992. After 10 years on tech trade magazines in London, including as editor of *The VAR* magazine and managing editor of *Network Reseller Magazine*, she turned freelance and moved to France. Since 2001, Sue has worked as a tech journalist for trade publications, web sites and national newspapers, as a prolific corporate copywriter and report writer for the Management Consultancies Agency and what was then Source Consulting. She ghost wrote ***Joined up systems***, published by Hodder & Stoughton.Recent reports covered: AI monetisation by telcos; smart cities in Singapore; a history of quantum technology: and the future of pharma supply chains. She writes extensively about tech in life sciences, healthcare and other sectors Sue works remotely from West Wales.

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Executive summary

Communication service providers (CSPs) everywhere are under immense pressure to do more and better with fewer resources. That means to reduce network operational costs while improving the quality of services and introducing new ones to gain additional revenues.

Several years' of analytics AI deployments and network automation efforts have failed to slash operational budgets or create much in the way of new revenues. In August 2025, Omdia published its *Global Telecoms Opex Tracker – 2024* which found that global telecoms opex rose slightly, by 0.2%, to $1.63 trillion in 2024 (total revenue increased by 3.4% to $2.01 trillion).

In a blog about its findings, Adam Mackenzie, Senior Analyst, Service Provider Networks at Omdia, wrote, "This improvement in the opex-to-revenue ratio from 84% to 81% (or from 67% to 65% when depreciation, amortisation, and one-off charges and income are excluded) suggests modest efficiency gains with encouraging but subtle improvements in opex for labor and network utilities. However, the industry remains quiet on revealing tangible cost benefits from AI implementations, despite claims of its transformative potential."

Likewise, despite years of effort and expense, excellent customer experience is still the goal rather than what has been achieved – telecoms still has one of the worst Net Promoter Scores of any industry.

Yet hope triumphs experience, not least because since the launch of ChatGPT by OpenAI in November 2022, AI technology has evolved and continues to evolve rapidly. Its progress is matched by the extraordinary investment in the data centre infrastructure required to run it. Gartner says worldwide spending on AI infrastructure will total $1.5 trillion in 2025. However, Philip Otley, Managing Partner for Telco, Infrastructure, Media & Entertainment at consultancy HTEC, warns, "Company boards and investors now assume that AI can automatically make everything more efficient, from customer contact centres to network operations, but most CSPs haven't sufficiently invested in the technology or the change effort needed to meet investors' expectations."

It is already abundantly clear that speed, cutting-edge tech and 'AI-everywhere' to leverage and enable network automation are not the keys to success so much as strategy, focus and pragmatism. As Nilmar Seccomandi David, Director of Autonomous Network and Infrastructure in the Global CTIO Unit of Telefónica, notes, "You can spend €1 million to implement a use case, but the benefit might be just €50,000. We can't justify that."

This report rounds up current and emerging opportunities offered by combining various kinds of AI with network automation. Chapter 1 looks at how telcos can leverage AI to do what they do but better, with initial success stories from Airtel, Telefónica and Comcast. Chapter 2 looks at the importance of network automation and what it can deliver in harness with AI, providing examples and case studies including Colt Technology Services, Virgin Media O2, Orange Business, Verizon, Deutsche Telekom and Google Cloud.

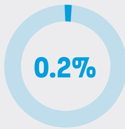
Chapter 3 examines progress with new services and looks to the future with examples and case studies from China Telecom, Fastweb, Swisscom, Telenor, Vodafone, Singtel and SK Telecom. Our Conclusion consists of 10 recommendations for telcos revving up to profit from AI and network automation, now and in future.

DATA POINTS

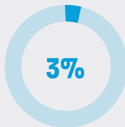
$1.5 TRILLION

Total worldwide spending on AI infrastructure

Source: Gartner



Amount global telecoms opex rose by in 2024 to $1.63 trillion



Improvement in the opex-to-revenue ratio from 84% to 81% (or from 67% to 65% when EBITDA excluded)

Source: Omdia *Gobal Opex Tracker – 2024*

CHAPTER 1

What benefits can AI bring to telecoms?

This is how McKinsey and Co. sums the situation up in a blog, *AI infrastructure: A new growth avenue for telco operators*, from February 2025, "Telecom operators have long provided the infrastructure to power communication and connect people. Now they are poised to take on a new role: building the AI infrastructure that enables enterprises, governments, and consumers to unlock AI's full potential."

Regaining lost ground

Let's start by looking how telcos can deploy 'AI infrastructure' to fix some fundamentals – we noted telecoms poor NPS in the executive summary. In some countries, customers are plagued by spam and scam calls: for example a survey by Age UK in 2024 found almost a fifth of the country's population over 50 years old, about 4.9 million people, are fearful of answering the phone because of fraud.

Philip Otley, Managing Partner for Telco, Infrastructure, Media & Entertainment at consultancy HTEC, says AI is the solution as "it can bring systematic intelligence directly into network infrastructure rather than [using] bolt-on solutions…[so]…CSPs can reclaim value in communications. This is fundamentally different from previous technology waves that simply increased speed or capacity." The Airtel case study on page 7 is a powerful, pioneering example of this.

Predictive is primary customer care

So far almost half of telcos' investment in AI has been around customer care (see page 14), yet the single thing that upsets customers most is poor or no service. They want ubiquitous connectivity, not best effort, as evidenced by 1.8 million customers signing up for T-Mobile's non-terrestrial direct-to-device beta trial, launched in February 2025, with the full service launched in June.

QUOTE

"This marks a pivotal shift from centralized AI systems to distributed intelligence at the edge, enabling our network to make real-time decisions that optimise each customer's experience – whether they're streaming, gaming, or working from home."

Elad Nafshi, Chief Network Officer of Connectivity and Platform, Comcast

Peter Jarich, Head of GSMA Intelligence, comments, "Networks themselves are becoming smarter, with about 20% of AI deployments focused on predictive maintenance, energy optimisation and performance management – all done proactively rather than reactively." As this report went to press, Vodafone Group announced a deal with Zinkworks to develop a Generative AI-driven platform that will improve mobile service quality, network energy efficiency, and performance for Vodafone customers throughout Europe.

Fixing the fixed

Nor does this proactive approach only apply to mobile. In September, the US' Comcast announced it is "embedding AI deeper into its broadband infrastructure than ever before" with a major deployment of AI-powered network amplifiers. The amplifiers "are capable of self-monitoring, self-healing, and self-maintenance," according to Comcast. Every 60 minutes, AI analyses 10,000 data points on 30 million network devices to enhance in-home Wi-Fi performance.

Elad Nafshi, its Chief Network Officer of Connectivity and Platform, said, "This marks a pivotal shift from centralized AI systems to distributed intelligence at the edge, enabling our network to make real-time decisions that optimise each customer's experience – whether they're streaming, gaming, or working from home."

Making the numbers add up

However, although almost 8 out of 10 companies have deployed GenAI in some form, roughly the same percentage report no material impact on earnings, according to McKinsey, in March 2025. It calls this the "GenAI paradox" and at its heart is an imbalance between "horizontal" (enterprise-wide) tools like assistants (copilots) and chatbots, which have scaled quickly but whose gains are proving hard to measure, and more transformative "vertical" (function-specific) use cases – about 90% of which are still in pilot mode.

McKinsey's conclusions chime with MIT's recent findings that 95% of enterprises are not gaining ROI from AI and supports the case for telcos to 'export' their proven internal AI investments in terms of tech and expertise. Demand for AI skills has far outpaced supply, jumping from the sixth to the top most scarce skills resource globally within 18 months according to the latest edition of The Nash Squared/Harvey Nash Digital Leadership Report, published in May.

Further, as AI adoption in telecoms accelerates, large language models' (LLMs') significant shortcomings in handling technical telecom knowledge (and that in a number of other sectors), regulatory compliance and network troubleshooting are becoming clearer. In response, GSMA has set up the Open-Telco LLM Benchmarks, an open-source community aimed at improving the performance of LLMs for telecom-specific applications. (Also see page 11, *AI in the RAN*.)

The community was announced in February 2025 by the GSMA's innovation hub, GSMA Foundry. Its role is as an industry-first framework for evaluating AI models in real-world telecom use cases. Supporters include Hugging Face, Khalifa University in Abu Dhabi, The Linux Foundation, and others. Some of the world's largest operator groups set up the Global Telco AI Alliance in 2024.

CASE STUDY

Telefónica

TELEFÓNICA TAKES CAREFUL AIM WITH ONGOING AN PROGRAMME

Telefónica is claiming Level 4 AN management, but not across the board. It launched its Autonomous Network Journey (ANJ) programme in 2021. The goal is to prioritise selected use cases and selected geographical markets, where the business case is strongest, due to unsustainable inefficiencies from legacy or more acute drivers regarding customers.

The company is taking an integrated approach with a holistic view of the service lifecycle from network planning to deployment, assurance and optimisation. This applies across all network domains, from radio access, to IP, core, telco cloud and fixed access networks.

In Germany, Telefónica O2 has deployed a network digital twin called NetOptimizer, which maps the status of its 28,000 mobile network sites and transport routes in real time. NetOptimizer can simulate different configurations and optimise virtual performance before implementing changes in the physical network.

As a result, its engineers are spending 80% less time on analysis in network planning, operations and optimisation and fewer human errors in network configuration and management has reduced capacity issues in the transport network by about 40%.

In Brazil, its Vivo-branded operating company has adopted AI-enabled self-healing in its 5G core network, using closed-loop automation and intent-based networking. The system autonomously detects and resolves anomalies (primarily in virtual machine performance) without human intervention. Since deployment, Vivo has reduced average mean time to repair by 30 minutes. These are just two examples.

In total, the company has tested some 400 different use cases in its ANJ programme. Many involve some level of AI, if not full multi-agent deployments. There is always careful balancing of benefits and cost, as highlighted by Nilmar Seccomandi David in the executive summary.

Once Level 4 ANs (see page 12, *Zero touch can be too much*) become the default across Telefónica, which is expected to take at least three or four years, the company aims to run dark network operations centres (NOCs) with no humans involved.

CASE STUDY

AIRTEL'S ANTI-FRAUD WORLD FIRST – WHAT A DIFFERENCE AI AND A YEAR MAKES

Airtel launched the first network-based spam detection solution in late 2024 which automatically alerts customers to potential threats. The anti-fraud system uses AI to analyse network traffic and detect suspicious calls, messages and links in real time. In February 2025, the solution was cited in a World Economic Forum white paper, *Artificial intelligence in telecommunications*, for, "Processing a staggering 2.5 billion calls and 1.5 billion messages daily, it successfully identified close to 1 million spammers every day within the first two months.

"The duallayered protection system integrates network and IT layers for comprehensive coverage. By analysing caller usage patterns, the AI algorithm flags suspected spam communications, offering immediate protection without user action. This approach ensures enhanced security and privacy for all customers."

In May 2025, the operator said it had achieved a world first when it implemented a real-time, network-wide block on malicious websites across all communication channels. This includes email, browsers, over-the-top messaging apps like WhatsApp, Telegram, Facebook, Instagram, SMS and more.

The measures are free of charge to consumers because the fraud detection is directly integrated into Airtel's mobile and broadband infrastructure. This has massively reduced the need for manual reporting and made customers' experience more secure: by June 2025 Airtel's AI-powered anti-fraud measures were cutting customers' financial losses by nearly 70% and there was a 14.3% drop in overall cybercrime incidents on Airtel's network.

These finding were validated by data from the Indian Cyber Crime Coordination Centre (I4C), Ministry of Home Affairs, published in September 2024. Note, the anti-malicious domain service was launched in Haryana circle, which covers most of the State of Haryana in the north-west of India, with nationwide rollout to follow.

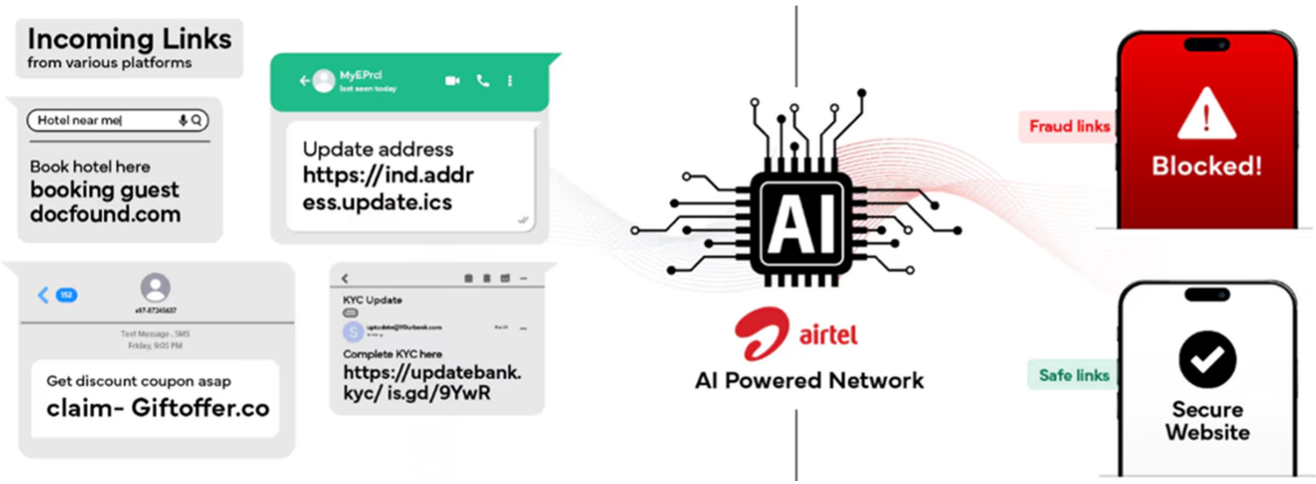
The network-based blocking of malicious websites works by Airtel continuously building its proprietary database of fraudulent domains, integrating data from global threat intelligence databases including Mavenir, Openphish, Mindtest, Google and Microsoft. It is updated every 24 hours.

The solution is modular and easy to integrate with telco systems across network and digital interfaces globally, without changes. Another major attribute is its rapid time to value. When a user clicks a link, the domain is mapped against this database. If identified as fraudulent, it is blocked. If the domain is not in Airtel's database, the operator uses partners' APIs to assess it based on several risk factors: the system connects users' interaction signals, AI reasoning engine and network-level enforcement into one loop.

QUOTE

"The duallayered protection system integrates network and IT layers for comprehensive coverage. By analysing caller usage patterns, the AI algorithm flags suspected spam communications, offering immediate protection without user action. This approach ensures enhanced security and privacy for all customers"

AI in telecommunications white paper, World Economic Forum



The schematic shows the workflow of the anti-malicious domain service

The platform calculates a composite fraud score in milli-seconds and, if malicious, the domain is instantly blocked at the DNS level.

In October 2025, Mavenir won the Airtel Innovation Leader Award 2025 for its AI-by-design Fraud and Security solutions in Voice, Messaging and Data, specifically for identifying 48 billion incidents of fraudulent activity.

Gopal Vittal, Vice Chairman and Managing Director of Bharti Airtel, was quoted in *Telco magazine* saying, "We are on a mission of eliminating spam and financial fraud for our customers. In the past year, our AI-powered network solutions have identified more than 48.3 billion spam calls and blocked 320,000 fraudulent links.

"However, we see this as small steps in a much larger fight. We will continue to innovate and invest heavily until our networks are free of digital spam and scams."

Airtel is a global communications provider with over 550 million customers in 15 countries across India and Africa. It also has a presence in Bangladesh and Sri Lanka through associate entities.

The company ranks amongst the top three mobile operators globally and its networks cover more 2 billion people. The operator positions its anti-fraud infrastructure as foundational to delivering trusted, resilient communications services both in India and across its footprint in Africa and Asia.

CHAPTER 2

Can AI transform infrastructure and business models by powering autonomous networks?

Generating new revenues has aroused the most interest regarding GenAI and agentic AI in telecoms. Marina Koytcheva, Research Director at STL Partners, notes that investors are less lenient with telcos financing big ambitious changes, compared to Big Tech giants or hyperscalers. She fears that if telcos are subjected to the same time pressures regarding return on investment as in the previous 15 years or so, opportunities could slip away.

Telcos desperately need greater operational and business agility to generate new revenues and AI-powered autonomous networks will be a major contributor. One of the reasons the Big Tech companies are viewed more favourably by investors is because so far, they have been able to adapt and seize new opportunities more swiftly, and counter emerging threats more effectively.

Tectonic shifts in infrastructure

Interestingly, some commentators, like John Mihaljevic of MOI GLOBAL, an investor community, argue that "by ramping up AI-related capital spending to unprecedented levels, [hyperscalers] have set themselves on a perilous path, away from high-margin, capital-light models toward a capital-intensive future in which their return-on-capital and margin profiles are highly uncertain."

Sebastian Barros notes on a LinkedIn blog that, "Hyperscaler CapEx has skyrocketed from $24B in 2015 to a projected $325B in 2025—a 13X increase in just a decade. Meanwhile, global telco CapEx is estimated at $297B in 2024, marking a 5% decline from the previous year.

QUOTE

"By ramping up AI-related capital spending to unprecedented levels, [hyperscalers] have set themselves on a perilous path, away from high-margin, capital-light models toward a capital-intensive future in which their return-on-capital and margin profiles are highly uncertain."

John Mihaljevic, MOI GLOBAL

"For the first time, the four cloud giants (Amazon, Google, Microsoft, Meta) are outspending the entire +1.150 telecom players."

Mihaljevic adds, "This AI-driven capex frenzy is eerily similar to the telecom bubble of the late 1990s and early 2000s. Extravagant spending on fiber optics and network infrastructure promised growth but delivered catastrophic oversupply and collapsing prices. Today's hyperscalers may be repeating history's costly mistakes."

Telcos are better placed

Telcos, often held back by legacy infrastructure and operations, have traditionally been much slower to shift direction. Now greater virtualisation of the network, via software-defined capabilities and cloud deployment, have helped to address this – as long as telcos understand where else this could take them, strategically and commercially. Add AI to the scenario, and real-time adaptation starts to become achievable.

Juniper Research expects operators' AI investment to exceed $86 billion by 2029, driven by attempts to achieve zero-touch operations within mobile networks, according to findings published in April. Zero-touch operations significantly minimise or eliminate human intervention in network operations, but that forecast relies heavily on operators exploiting agentic AI, which is still an emerging technology but very much in telcos' sights (see Verizon case study on next page). Juniper claims the biggest ROI will come from deploying agentic AI in the RAN and work is underway.

Autonomous RAN opportunities

In February 2025, Deutsche Telekom and Google Cloud announced a new partnership to improve RAN operations through the development of a network AI capability – the RAN Guardian agent, built using Gemini 2.0 in Vertex AI from Google Cloud. This AI-powered assistant can analyse networks' behaviour, detect performance issues and

CASE STUDY

verizon

AGENTIC AI AT VERIZON

Verizon sees agentic AI is seen as a continuation of its "productivity and efficiency play". Himanshu Polavarapu, Associate Vice-President of Tech Strategy and Enterprise Architecture, Verizon, explained in an interview with TM Forum, how an ecosystems of coordinated specialist agents improves experiences for customers, the network and employees.

Frontline staff are equipped with a "personal research assistant" (PRA) which trawls through disparate sources and documents to find the answer or best solution for customers.

A "Network Genie" provides similar help to teams involved in network planning, engineering, system performance and service assurance. Network personnel can ask the Genie what to do in a certain situation, and receives a recommendation based on the closest correlation between the current case and previous scenarios and outcomes.

Verizon is selective about where it tests and deploys agentic solutions, referring back to the AI Council it established to help guide its GenAI initiatives.

Verizon also has a product that readies an end-to-end orchestration for an employee to solve an issue and, if the user accepts it, automatically deploys. "This is our strategy: a tiered competency approach within the network journey that invokes different capabilities in different scenarios," says Polavarapu.

QUOTE

"Traditional network management approaches are no longer sufficient to meet the demands of 5G and beyond. We are pioneering AI agents for networks, working with key partners like Google Cloud to unlock a new level of intelligence and automation in RAN operations as a step towards autonomous, self-healing networks."

Abdu Mudesir, Group CTO at Deutsche Telekom

implement corrective actions to improve network reliability, reduce operational costs and enhance customer experiences. For customers, it should mean fewer disruptions, more optimal speeds and an enhanced mobile experience.

Speaking at the time of the announcement, Abdu Mudesir, Group CTO at Deutsche Telekom, said, "Traditional network management approaches are no longer sufficient to meet the demands of 5G and beyond. We are pioneering AI agents for networks, working with key partners like Google Cloud to unlock a new level of intelligence and automation in RAN operations as a step towards autonomous, self-healing networks."

AI in the RAN

Telecoms analyst Larbi Belkhit is part of ABI Research's Strategic Technologies research group focused on 5G, 6G, and Open RAN research. He has highlighted the rise of 'AI RAN' as key to RAN automation for 5G as it will determine how mobile operators manage, deploy and monetise their mobile infrastructure in future. RAN automation is required for orchestrating slices end-to-end and enforcing service-level agreements (SLAs).

The AI RAN offers monetisation opportunities such as: automated SLA management and the dynamic adjustment of SLA metrics; quality of experience (QoE) monitoring and optimisation, using predictive models to refine service delivery; assurance for RAN slices and SLA assurance; fast-loop optimisation to meet SLAs; and slice-aware admission control which prioritises access for different user types.

It is still very early days. ABI Research doesn't anticipate a ramp up in deployments much before 2029. Meanwhile, to support broader adoption of AI RAN for automation, he says, the telecommunications industry must:

- Standardise interfaces for multi-agent orchestration;
- Partner with hyperscalers such as Amazon Web Services (AWS) and Google Cloud to accelerate AI integration;
- Mature data strategies to enable higher granularity and context awareness; and
- Develop more transparent and explainable LLMs – see page 6.

Zero-touch can be too much

Inside and beyond the RAN, a comprehensive approach to zero-touch networks would appear to be the obvious way to leverage AI, but it may be unrealistic and hard to justify financially across the board. This is reflected in the most recent TM Forum regional benchmark report, published in summer 2025, which finds that only 4% of communication service providers (CSPs) have achieved TM Forum's definition of Level 4 autonomy to date, and just 23% expect to get there by 2026.

A more discerning and incremental approach is now seen as more pragmatic, targeting specific 'high-value scenarios' rather than sweeping, end-to-end automation. This is based on a greater understanding that different parts of the network warrant different levels of autonomy – and investment.

The Virgin Media O2 case study (right) shows how the operator is planning to gain new value from doing what it does already, but very much better, as it readies its network platform to deliver customised network experiences and tailored services by leveraging network automation and AI.

The Orange case study on the next page shows how the operator group is already monetising its investment in AI operations. Then in the next chapter we look at leading edge and future services.

CASE STUDY

VIRGIN MEDIA O2 WORKS ON PRE-EMPTING PROBLEMS TO IMPROVE CX

In the UK, Virgin Media O2 has high levels of automation in its network. The company strives for remote resolution of issues via process automation to avoid the costs and delays associated with field engineering work. Julian Davidge, Virgin Media O2's Director of Technology Service & Operations, believes the percentage of field fix-based tickets is now in single digits, which in turn increases the potential for automation.

In a panel discussion, Taking network automation to a new level with AI, as part of a ***Mobile Europe*** virtual conference earlier this year, Davidge said the next opportunity would be related to customer behaviour and network-performance – identifying and addressing issues before there is an impact on the customer.

He reckons this is where the strategic potential of AN becomes more interesting and multi-faceted. Using AI in pattern recognition for anomaly detection is part of that picture, but the broader opportunity is linking internal insights with activities and mentions on social media, or using the latter as the basis to interrogate the former.

Being ahead of issues would benefit all customers and have a positive reputational impact. Maintaining higher service levels and higher customer satisfaction ratings will target churn and should also trigger positive word-of-mouth feedback, with the possibility of converting new customers through superior service.

The next step in AN is creating new value from these continuing investments via ever more optimised and customised network experiences that can be provisioned automatically. Examples could include: excellent coverage at major events with dense usage; for applications that are sensitive to latency, like medical use cases; AI solutions for enterprise; or a combination of them.

CASE STUDY

ORANGE ON THE CUSP: TURNING INTERNAL AI INVESTMENT INTO EXTERNAL SERVICES

In 2024, Orange claimed to have generated nearly €200 million in value from the use of AI, across more than 150 operational use cases. In 2025, it expects that figure to be closer to €300 million. Most of this is attributed to cost savings and other efficiency gains, and the less tangible (and less acknowledged) but still valid impact on employees' satisfaction, implying better engagement, reduced staff turnover and lower recruitment costs.

At the last count, about 80,000 of Orange's staff were using its Live Intelligence GenAI platform and associated library of 14,000 AI assistants. "ROI can be seen in multiple different ways, where we are leveraging AI for our own internal use and internal optimisation," observes Usman Javaid, Global Chief Product and Marketing Officer at Orange Business and a board member of Orange group.

Use cases range from customer support and analysing tickets, to reducing the time taken to resolve incidents, allowing teams to focus on more complex tasks. Digital twins help improve the uptime of services by predicting failures before they happen as well as with proactive capacity management, fraud detection, less energy consumption and better management of energy tariffs. Javaid describes the latter as a "huge use case".

QUOTE

"In dollar terms, I see the value chain as $1.00 for our AI-platform-as-a-Service, $3 in professional services, and $8 related to infrastructure,"

Usman Javaid, Global Chief Product and Marketing Officer at Orange Business and a board member of Orange group

External revenues

When enterprise customers ask about projected return on investment (ROI) if they leverage Live Intelligence, there is no simple answer because it depends on many variables. Nevertheless, Javaid anticipates a healthy revenue stream from the platform: "In dollar terms, I see the value chain as $1.00 for our AI-platform-as-a-Service, $3 in professional services, and $8 related to infrastructure," he says. "It will help deliver our ambition of two-digit growth in AI products and AI services on a year-on-year basis."

Orange Business emphasises the correlation between user adoption and employees' satisfaction: Live Intelligence gives employees the AI tools they want without exposing the company to 'shadow IT', whereby users deploy free versions of models like ChatGPT on the company's systems, and the problems associated with unmoderated and non-compliant AI use.

CHAPTER 3

Building autonomous networks, leveraging AI to underpin new and future services

The rapid evolution of AI over the last three years is enabling an extended infrastructure play to make AI more accessible, performant, assured and compliant closer to the point of need. It encompasses optimised data centres or AI factories, and edge cloud capabilities close to where data is created and consumed and being able to sell AI- and network-oriented capabilities to customers.

This distributed architecture reduces latency, increases responsiveness and improves scalability for latency-sensitive applications such as connected sensors in smart cities, smart manufacturing, stadia and event venues, among other things.

Assurance first

As the most advanced telcos launch or prepare to launch new services and revenue streams that depend on automation and AI to an unprecedented extent, there is an element of AI and network autonomy that needs deep and careful consideration: assurance.

This presents telcos with both a challenge and an opportunity because the value of AI depends 100% on users in B2B, B2C and B2B2X business models (see page 18 – SK Telecom) trusting the technology and all associated output and outcomes.

Regulators and quality controllers insist on adequate guardrails being in place, along with transparency and explainability. They allow validation teams and process auditors to verify autonomous or AI-augmented and machine-enabled decisions are accurate, appropriate and safe.

QUOTE

"At its core, AI assurance refers to a range of services for checking and verifying both AI systems and the processes used to develop them, and for providing reliable information about trustworthiness to potential users."

Source: The Global Digital Foundation

Factoring in the cost – and opportunity

An ecosystem of tools, solutions and services is evolving to help provide that assurance. For enterprises looking to embed AI strategically within core business operations and externally-facing activities, the cost of that assurance must constitute a big part of the business case.

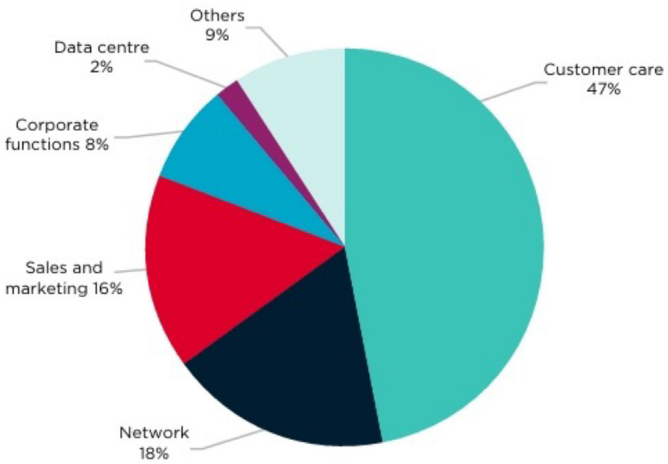
The Global Digital Foundation, which specialises in digital policy, describes assurance this way: "At its core, AI assurance refers to a range of services for checking and verifying both AI systems and the processes used to develop them, and for providing reliable information about trustworthiness to potential users."

"The more the enterprise adopts and monetises AI, the more they need to factor in the cost of assurance," says Guy Lupo, Executive Vice-President for AI & Data Innovation at TM Forum. As things stand, awareness around this is relatively low, and formal conversations about it are sparse, which he finds "shocking".

He is passionate about this "chasm of trust" which formed the basis of his PhD thesis. And the more embedded and seamless AI's role within processes, the greater the risk, he notes: "The more 'magic' – greater the reliance on fast-coding or no-code platforms – the less trust there will be and the greater the spend on assurance dollars."

A big opportunity for operators

This is both a challenge for operators, as they look to address AI assurance internally, and a potential opportunity – if they can command their share of AI assurance revenue streams in the enterprise market. The UK has already identified the potential for leadership in AI assurance at government level. A new roadmap, announced in September and outlined in a policy paper, includes plans to set up an AI assurance consortium. (Also see Deutsche Telekom, Cloud-Edge on page 10.)



Where is the AI sweet spot? Percentage of telco AI deployments

GSMA Intelligence estimates about half (47%) of AI deployments by telcos around the world are in customer care: only 10-20% of current deployments are specifically aligned to driving new business and revenue growth. GSMA Intelligence expects this will change from 2026 onwards as operators build their understanding of and ways to capitalise on emerging opportunities including those linked to GPUaaS (including pay-per-use access to AI computing power in the cloud) and agentic AI.

Source: GSMA Intelligence: *Telco AI: State of the Market Q2 2025* report, July 2025

QUOTE

"By being the first to use our AI solutions, we can be certain of their dependability and efficiency before introducing them to clients. The point at which we'll begin to generate revenue is when these solutions are productised – and trialling our own solutions is key to achieving this revenue generation."

Frank Miller, Chief AI and Platforms Officer, Colt Technology Services

In 2024, Grand View Research projected that the global AI trust, risk and security management market size will be worth $7,444.9 million by 2030, growing at a CAGR of 21.6% from 2025 to 2030. The growth is primarily attributed to the increasing demand for ethical AI practices.

AI-as-a-Service

This acute need for trust and reliability offers immense scope for operators to offer new services, such as AI-as-a-Service (AIaaS) and tools through a cloud computing platform. The first reason is so that users don't have to invest in and maintain the underlying infrastructure themselves.

The second is so enterprises can address the challenge exposed by MIT research published in August. As we mentioned, that study indicated alarmingly high rates of failure (95%) among enterprise GenAI pilots, due largely to difficulties with exploiting the technology effectively within existing workflows.

Colt Technology Services is working to address enterprises' needs. It runs wholesale networks in Europe and Asia and co-owns Lumen's Tier 1 automation platform. It sees the opportunity to map internal gains to business customers' own priorities, which it surveys regularly. Its latest IT Priorities Research, which polled over 1,200 IT leaders in 13 countries across the US, Europe and Asia to determine how they're prioritising their AI spend, identified an even spread across AI-driven innovation and product development.

The ranged from Generative AI for content development to solutions for cybersecurity and threat detection, AI to enhance customer experiences and AI to drive process optimisation and efficiency improvements. Colt has been testing all these use cases.

Says Frank Miller, Colt Technology Services' Chief AI and Platforms Officer, "By being the first to use our AI solutions, we can be certain of their dependability and efficiency before introducing them to clients.

The point at which we'll begin to generate revenue is when these solutions are productised – and trialling our own solutions is key to achieving this revenue generation."

At China Telecom, rich experience in using AI to automate energy optimisation and savings in its own operations has given rise to similarly targeted opportunities – to expose those same AI capabilities to energy companies or data centre facilities. The plan is to add new value for customers, while multiplying its return on investment.

In the first half of 2025, China Telecom's combined 'intelligent' revenue from providing AI and intelligent computing services to customers grew almost 90% to RMB 6.3 billion (roughly $885 million or €763.7 million) out of its total service revenues of REM 23 billion, according to its H1 results, published in August 2025.

The backbone of AI infrastructure

The monetisation opportunities for telcos linked to providing AI factory facilities and GPU-as-a-Service (GPUaaS) are in their infancy, as indicated by the pie chart on the previous page. GPUaaS is an AI compute delivery model that enables users to deploy GPU resources in the cloud rather than owning and maintaining them on their own premises. Singtel (see page 19) is blazing the trail.

ABI Research estimates that the telco industry will generate more than $21 billion in GPUaaS revenue by 2030, as operators capitalise on opportunities to become "the backbone of AI infrastructure" for national or regional AI demand. Although the big-tech companies are racing to roll out more of their own facilities closer to local markets around the world, telcos often have a head start in terms of established regulatory compliance and trust in their immediate and neighbouring territory.

It is not only local access to GPU compute capacity that is needed, for instance by local enterprises as their own AI ambitions grow. Telcos also have another ace up their sleeve compared with hyperscalers – the growing desire for sovereignty over data and infrastructure as geopolitics become ever less certain. (see Singtel case study on page 19 for how it plans to follow its GPUaaS offer).

Deutsche Telekom has capitalised on this opportunity with the construction of a sovereign compute infrastructure, spanning an AI Gigafactory initiative in partnership with NVIDIA in Germany, as well as its own pan-European Cloud-Edge infrastructure with the European Commission's blessing, to see off competition from other regions, especially the US.

Many other telcos are partnering NVIDIA to build AI infrastructure in Europe, to serve regional enterprise customers, include Orange, Italy's Fastweb, Swisscom (which it markets as AI made in Switzerland), Telefónica and Telenor.

Revenue in the clouds

Deutsche Telekom describes its Cloud-Edge as "AI ready" with assured performance and controls for critical applications needing ultra-low latency and high data security. They range from real-time industrial automation use cases, to Internet of Things (IoT) analytics, as well as immersive augmented and virtual reality (AR/VR) experiences, and private edge use cases.

Deploying their own cloud facilities gives operators full control over network functions, security policies and performance optimisation, for their own purposes and as the basis for external revenue streams. Other operators with their own edge computing cloud offerings include Vodafone, Singtel, SK Telecom, Telefónica, Bell Canada, KDDI, Orange, China Mobile, Verizon and AT&T. Most have been developed in partnership with the major cloud infrastructure providers.

Says HTEC's Otley, "For smart cities and IoT applications, AI solves the fundamental challenge of making urban connectivity truly intelligent. In a smart city, thousands to millions of devices are constantly uploading

DATA POINTS

$21 BILLION

Amount telcos will generate in GPUaaS by 2030

Source: ABI Research

data to the network – sensors, cameras, autonomous systems. Smart cities only become real when ultra-fast networks are paired with intelligence and automation at the edge. This allows operators to offer managed IoT services and utilise AI to generate insights and take action from the data flowing through their networks."

Vodafone, he notes, has invested heavily in building out its own IoT platform to enable monetisation of IoT services. Meanwhile AT&T has invested heavily in developing leading connected car solutions.

"An edge strategy allows CSPs to pivot toward platform business models, offering compute, storage and AI capabilities as services, opening new recurring revenue streams beyond traditional voice/data," Otley says.

"While hyperscalers dominate model training and centralised inference, telcos can differentiate through location-aware, regulatory-compliant, privacy-preserving local inference, harnessing their unique advantages in regulated sectors like healthcare, retail and manufacturing, where proximity, compliance, and network integration create meaningful differentiation," he continues.

Interesting times

After so many years of talking about new services and revenue streams, the combination of AI and network automation offers huge promise, as shown in this chapter.

Bain & Co. noted in a blog published in October 2025, AI is important in closing the telecoms industry's $28 billion free cash flow gap, by ensuring networks are no longer static infrastructure but rather adaptive platforms for growth and resilience.

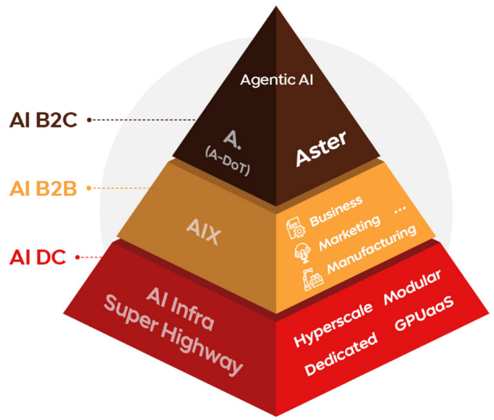
In the Conclusion to our report, we make 10 recommendations to help telcos overcome potential derailments.

CASE STUDY

SK TELECOM'S RADICAL STRATEGY

South Korean operator SK Telecom has a multi-faceted AI strategy which addresses some of the most ambitious and potentially lucrative commercial opportunities. Two years ago, it set an aim of $18.5 billion in AI revenue by 2028 and reorganised its structure and activities around achieving its goals.

Its plans straddle three AI dimensions; infrastructure, transformation and services which form SK Telecom's AI Pyramid strategy (see diagram).



The three dimensions of SKT's AI strategy

Source: SK Telecom, May 2025

In the first quarter of 2025, it reported a surge in its AI business. Revenue growth was derived particularly from its AI data centre (AIDC) revenue, while the company claimed increased traction for both its consumer and enterprise AI offerings, citing more than over 9 million users of its 'A.' assistant.

SK Telecom published an update to its strategy in May 2025. It highlights what the operator sees as the main AI monetisation vehicles: AI Data Centres (AI DC), AI B2B and AI B2C offers. The operator is leveraging partnerships, including with: Lambda, the global GPU cloud provider; Penguin Solutions which specialises in AI-driven data centre solutions; and the AI startups Anthropic and Perplexity AI.

CASE STUDY

SINGTEL LEADS WITH GPUaaS AND PREPARES TO 'MOVE UP THE STACK'

Singtel is one of the world's most advanced telcos and among the largest "communications technology groups in Asia". Singtel's pioneering, home-grown, award-winning Paragon platform builds software to help telcos monetise their networks, such as through network slicing, edge and mobile edge compute, managing network quality of service and providing digital experiences for consumer customers.

Singtel group's Digital Infrastructure company announced its intention to offer GPUaaS in March 2024, and launched its GPU cloud, RE:AI in October 2024. According to Manoj Prasanna Kumar, CTO of Singtel group's Digital Infrastructure company, in an interview in August 2025, all the AI chips "are getting steady and high demand".

RE:AI is powered by its Paragon platform and is the first in Singapore to run NVIDIA's GB200 Grace Blackwell (GB) Superchips and federates capacity with hyperscalers that have deployed GB chips elsewhere for global customers that do not specifically require GPUs inside Singapore. Kumar says, "It's a mutual win. We provide a single window of access to global capacity to customers [while] acting as business catalysts to our partners."

QUOTE

"The more applications we help customers adopt, the more of their problems we can solve. As more customers use those apps, the more the underlying GPUs and consequently the underlying data centres are used. It's symbiotic throughout the stack."

Manoj Prasanna Kumar, CTO of Singtel group's Digital Infrastructure company

Digital InfraCo has deployed closed-loop automation in AI cloud operations to improve operational resilience but "You can never say you're 100% covered by a fully closed-loop system because at any time we can discover something else," he notes.

"With tasks that are well oiled and repetitive, automation can help, largely in reducing human tasks. But for new things, automation – even AI – is data in, data out. Without similar instances in the past, AI is not magic box to learn how to predict and handle an incident."

Singtel continues to expand with more and newer GPU models within Singapore and is looking at regional expansion where it can easily replicate what it has done in Singapore to cater for sovereign demands in other markets.

He adds, "the next logical evolution for us [is] to have a play in the application space [to offer] popular apps that have been adopted by vertical customers in other markets and cross-pollinate them into Singapore."

Kumar continues, "The more applications we help customers adopt, the more of their problems we can solve. As more customers use those apps, the more the underlying GPUs and consequently the underlying data centres are used. It's symbiotic throughout the stack."

PARTNER CONTENT

From AI-integrated to AI-native: intelligence everywhere

Partner content by MAVENIR

After years of virtualisation initiatives that promised a panacea but delivered only modest results, network operators' biggest challenge – now and in the coming years – is to keep the faith. They must recognise that the toolbox they've been using just got the biggest upgrade in the history of this sector.

As this *Mobile Europe* report identifies, operators are trying to achieve a trio of very obviously competing objectives – reducing costs, improving service and driving new revenues. Making the shift from AI-integrated to AI-native is the only way that all of these objectives can be met, and it's essential for the evolution to 6G architectures.

Successful investment in AI will start with an AI-integrated approach: targeted deployments that solve specific problems and with low risk, low disruption and steady rewards. But it must go beyond using AI as a capability in isolation to augment existing processes. Crucially, it's about building systems – from day one – to be part of a bigger AI vision of agentic, intent-driven operations, with intelligence everywhere.

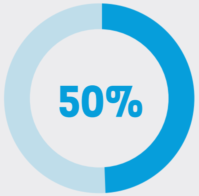
That's not just a tagline. It's the framework for making the promise of AI real and creating a whole new economy for operators as they transition from Telco to TechCo.

Through this process, operators will embed insights and intelligence directly into the fabric of their networks, creating systems that can reason, predict and act at scale. Solutions for this transformation target three key foundations of the Telco to TechCo journey: Autonomous Networks, Monetization, and AI-optimized RAN architectures.

DATA POINTS

300+

The number of Mavenir operator deployments globally



Reaches more than half the world's subscribers

120

Countries served

Source: Mavenir.com

This shift will enable operators to convert four decades of physical investment into digital advantage and monetization, and that is pivotal to the transition from Telco to TechCo.

This transformation is not about branding or market positioning, it's economic necessity. As current revenue sources plateau and costs increase, the ability to create and capture new value beyond traditional telecom customers is essential.

TechCos are agile, software-driven businesses that can innovate and monetize on an industrial scale, providing services to any and all vertical markets – and that is the future for today's Telcos.

Why 'AI-native' matters

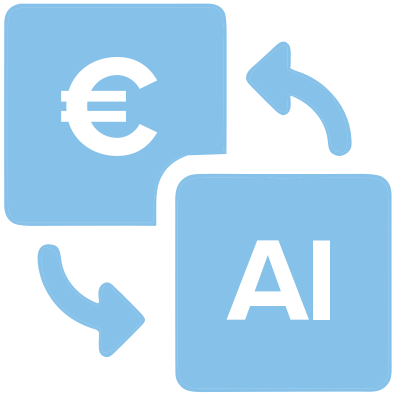
Most operators have already invested in AI. Many have seen incremental savings from energy management or predictive maintenance. But these initiatives remain largely piecemeal and dependent on human intervention, with fragmented data pipelines.

AI-native networks will weave intelligence into every layer – from the RAN to the core – and enable efficiency, assurance and monetization.

AI for Functional Efficiency enhances the intrinsic intelligence of RAN, Packet Core, and IMS domains through self-aware dynamic optimization, domain-specific models, and real-time policy enforcement.

AI for Operational Efficiency focuses on AI-driven automation of NOC workflows, fault management, observability using layered agents, digital twins, auto-RCA and GenAI copilots to reduce manual effort and enable zero-touch operations.

This approach enables self-optimising systems that understand context, automate intent, and continually learn from their own performance.



MONETIZATION THROUGH INTELLIGENCE

AI voice and messaging are re-inventing the operator's service layer. Real-time translation, call summarisation and emotion detection elevate voice from a utility service to a value-added platform once again. AI-powered messaging protects revenues through fraud detection and opens up enterprise use cases in IoT, logistics and customer engagement.

Voice AI, messaging platforms and conversational AI agent creation enable new consumer and enterprise revenue models with carrier-grade scalability. When combined with cloud-native charging, these services can scale profitably across all verticals.

INSIGHT

Voice AI, messaging platforms and conversational AI agent creation enable new consumer and enterprise revenue models with carrier-grade scalability

The transition will be challenging and it will take time. It demands three fundamental capabilities:

1. An intrinsic understanding of telecom networks – how they've been engineered to be what they are today, and the reality of how they're managed.
2. Openness, interoperability and scalability – the ability to deploy AI wherever it adds value, across public, private and hybrid cloud environments.
3. Software built from the ground up – the vision of integrated data sources and intelligence throughout the operation from day one, by-design.

A unified data fabric, telecom ontology, and knowledge graph, combined with a central AI engine, power proactive automation — from KPI correlation and failure prediction to digital-twin-validated closed-loop mediation.

With these in place, operators can evolve their networks out of their current state of complexity and into their role as a foundation for growth.

Mavenir has deployments with 300+ operators globally in over 120 countries, which together serve more than 50% of the world's subscribers.

Autonomy as a business enabler

Autonomy in networks is an enabler of performance, agility and new revenue. It shouldn't be thought of only in operational terms, like self-healing, self-configuring and self-optimising.

Agentic Service Assurance enables predictive, self-healing, and intent-driven operations, helping progress toward Autonomous

Network Levels 4 and 5, ensuring continuous optimization across RAN, core, and service layers.

Autonomy, combined with SLAs/KPIs provides the ability to launch new services and to serve enterprises and verticals with guaranteed performance and reliability.

As networks gain intelligence, operators can move from offering (and charging for) best-effort connectivity to providing outcome-based experiences. That could be latency assurance for industrial robotics, energy optimization for smart cities, or location-aware compute for connected vehicles.

These capabilities will underpin a new generation of commercial models. Cloud-native BSS and AI-driven charging systems will make it possible to launch and monetize services in days, not months. Unified data fabrics will bring together customer, service and network intelligence, turning analytics into action and insight into revenue.

And telco domain expertise will be essential to this. The rhetoric around AI often leans towards hype, and there's no doubt that many claims of its capabilities – for now and in the future – go too far.

For the majority of network operators, the supposed utopia of full 'zero-touch' automation may not be realistic or desirable. The winning strategy is human-guided autonomy: a pragmatic mix of intent-based automation and expert oversight, where trust, transparency and explainability are built into every algorithm.

From edge to everywhere

Built on decades of network investment, operators possess a structural advantage that no hyperscaler can match – the connectivity footprint.

INSIGHT

As networks gain intelligence, operators can move from offering (and charging for) best-effort connectivity to providing outcome-based experiences

AI RAN – INTELLIGENCE AT THE EDGE

AI is being integrated into radio access networks to enhance performance, automate configuration, and enable predictive assurance with closed-loop optimization. This approach is paving the way for a future where intelligence is embedded everywhere — across edge applications, private networks, and diverse industry verticals.

- RIC-led optimisation improves spectral efficiency and maximises coverage
- Predictive configuration reduces energy consumption and manual workload
- Digital-twin validation ensures safe, data-driven change automation.

While economics mean GPU-based RAN is only emerging gradually, operators can take advantage of intelligence where it makes commercial sense today, with a clear roadmap towards AI-native 6G architectures that leverage distributed inference and model optimization to minimize GPU dependency.

AI-optimized RAN software supports macro, small cell, and Non-Terrestrial Network deployments, enabling energy efficiency, spectrum optimization, location-aware compute, and edge intelligence.

And future AI-native service propositions will exploit operators' uniquely distributed footprint with so many edge interfaces, bringing inferencing closer to the end user.

Telcos run the most distributed compute environments, with thousands of edge locations designed for low latency, resilience and compliance. By extending these assets into unified AI clouds, operators can offer GPU-as-a-Service, AI training and inference at the edge, with real-time analytics for vertical markets.

This is the first true opportunity for operators to monetize their distributed infrastructure beyond connectivity, serving both telco and non-telco applications from a single AI-native platform.

The path forward

Smart adoption of AI will be guided by clear purpose and measurable outcomes. The goal is fundamental change, but the many steps to get there will be small, precise and meticulously planned.

The most successful operators will be those that view AI and network automation not as features to augment their operation (the 'AI-integrated' approach), but as organising principles and enablers of efficiency and innovation.

Short-term benefits include fewer alarms, faster root-cause analysis, predictive maintenance and optimized resource utilization, while longer-term evolution moves toward intent-driven management and AI-native 6G networks.

INSIGHT

Telco-first. Cloud-native. AI-by-design. That's not just a tagline. It's the framework for making the promise of AI real and creating a whole new economy for operators as they transition from Telco to TechCo

At the point where AI is built in by design, the network itself becomes a platform for intelligence everywhere, capable of powering not only communication, but every industry vertical.

A pragmatic optimism

After the years of focus on virtualization, the next phase must be about intelligence everywhere – throughout the network. Operators need faith in the new tool kit, but the shift to AI-native as an approach and an outcome is not a leap of faith – it's a measured, structured, pragmatic evolution, built on the same discipline that has made telecoms the world's most reliable digital infrastructure.

Progress will be incremental, beginning with the introduction of intelligence into existing systems to solve real problems. And AI adoption will grow – rapidly – into a new way of working that creates new levels of performance, new services, and entirely new value chains that extend well beyond connectivity. It will create the TechCo.

FROM REACTIVE TO PREDICTIVE

An Agentic Service Assurance framework embeds AI agents within live network functions, monitoring call setup, latency and performance in real time. Instead of waiting for OSS alarms or ticket escalations, the network diagnoses anomalies at source.

Real-time monitoring, anomaly detection and auto-RCA built directly within network functions, eliminate delays inherent in traditional OSS-centric investigation models.

The result is faster root-cause analysis, lower MTTR, and significant opex savings, turning reactive operations into proactive performance.

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CONCLUSION

How to leverage AN and AI for new services and revenues, now and in future

10 recommendations to move forward

No two operators are the same, nor any two markets. Even so, the common goal for telcos is to identify and capture a sustainable share of the increased value delivered by harnessing AI and network automation. Here are some ways that telcos should be preparing for a future that has everything to play for but is likely to be expensive and demanding to conquer, and some issues to keep at front of mind.

1 Increasingly agile, adaptive, virtually provisioned and autonomously managed networks will be essential. That does not necessarily mean embedding AI at every level operationally – economics have to come into it. Telcos must look beyond static, rules-based network automation to AI-enabled, dynamic orchestration across multiple network domains – from 5G radio access to IP transport and optical cores.

2 Juniper Research notes that if operators want to achieve zero-touch operation of their mobile networks, this will rely heavily on adoption of agentic AI in the RAN to enable real-time optimisation through reduced latency. The firm advises operators to opt for lightweight models, with a smaller number of parameters, to ensure AI models support lower latency for better customer experience.

3 Zero-touch operations may not make strategic or commercial sense in many cases, especially if the cost is too high, such as in legacy scenarios. TM Forum's Lupo says AI's greater value is often in augmenting rather than replacing the work of human experts.

4 As AI's input increases, so can pressure on peripheral budgets, such as in the supply chain, perhaps in the form of increased Azure storage capacity or soaring spend on platforms like Splunk or unpacking log data. This needs to be factored into the business case and ROI.

5 Preoccupation with achieving ever-better 'operations' as an end in itself risks overshadowing delivery of more innovative value for customers. Smarter, more agile network operations will be key to advanced services, but there are other considerations beyond achieving high levels of AN management – see below.

6 On a broader infrastructure scale, AI promises to help optimise resource use in edge data centres in addition to maximising performance. This includes energy use and cooling, which are important to companies' sustainability efforts and reported carbon footprint. A 2025 report by The World Benchmarking Alliance (WBA) and the International Telecommunication Union (ITU) suggests that the highest-emitting AI systems could potentially produce up to 102.6 million tonnes of CO_2 equivalent (tCO_2e) annually. China Telecom's evolving strategy, detailed at the 2024 AI for Good Global Summit, is apparently effective at providing mitigation here, targeting better energy efficiency inside and beyond the operator.

7

Partnerships will be crucial to infrastructure-based propositions, as a means to accelerate delivery, share costs and access expertise: AI requires phenomenal investment and there is a global skills gap, and keeping AI skills current is hard given the speed of technologies' evolution. From strategic tie-ups with AI hardware giants like NVIDIA, to the global cloud giants, innovative app developers and specialist services, telcos must each find the ideal blend of home-grown and outsourced capabilities to achieve their business goals.

8

TM Forum's Lupo stresses that real monetisation is about implementing AI to achieve "a positive multiplier effect," which is eluding most operators. "I see the telecoms industry investing at a level above market rates in getting AI right, yet also failing at a level above market rates," he says due to following hype rather than, say, heeding how much customers hate some chatbots in assistance use cases. Lupo says sometimes received wisdom in the industry is so strong, nobody likes to question it but attention must be on real monetisation opportunities. The key is for AI to be accountable and dependable so more users and use cases rely on it.

9

Although operators may be feeling overwhelmed by the amount and scope of the work needed to exploit AI and network automation, GSMA Intelligence's Jarich says, "AI transformation [is] a marathon, not a sprint. As telcos size up their opportunities they should take advantage of emerging frameworks and blueprints created by global industry associations like the GSMA, with input from across the industry.

10

Keep a weather eye on 6G and its implications for network automation and leveraging AI. European telcos risk being left behind because of their reluctance to engage on the topic, whereas Asia is a hotbed of activity. For example, Japanese operator SoftBank's strategy is built around the integration of AI and communication, and notes that with 6G their integration will advance substantially so AI can optimise communication networks in real-time. Already SoftBank's AI for RAN is a new architecture that integrates AI applications and the RAN on the same computing platform.

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