Automation closes the business to network gap

Eyal Shaked, Intelligent OSS GM at Amdocs, explains how an intent-driven approach boosts network resource allocation and business outcomes.

Colt’s Keri Gilder
The CEO of one of the biggest B2B operators on a milestone year and the critical importance of culture

Fibre or bust
Investment for build is tight and faster take-up imperative. Operators are now acting to deliver what users want

Big trends
AI tops the agenda, cloud lifts networks but 5GSA slows. How much is ownership and the structure of telcos changing?
Join us for a day of invaluable in-person discussions, networking and knowledge-sharing.
I asked ChatGPT to write this column for me. Despite a few attempts, I’ve still had to write most of it myself. I asked for a summary of the infrastructure-related main themes at MWC 2024. Instead I got grandstanding advertising copy about the event itself. It started by welcoming readers to “the epicenter of innovation and collaboration in the global telecommunications and mobile technology landscape”.

When I specified the improvements I wanted, the response was for the language to become more highfalutin and awkward. This struck me as a weirdly human reaction. Many times in my working life I’ve asked a question someone can’t or doesn’t want to answer. They have responded by hiding behind a wall of jargon, with a heavy dusting of abbreviations and acronyms.

This ChapGPT experience is also a good if somewhat clumsy analogy for how far GenAI has come – and how far it and AI in general have to go. I deliberately avoided saying “to reach their full potential”. This is a stupid phrase in our industry because we always come up with better performing or new tech, hence the benchmark moves constantly.

GenAI aside, more muted headlines of the last year are that progress with deploying Open RAN and 5G Standalone has been slower than expected. Nor does it look like speeding up in the foreseeable future. Also, telecoms is facing more uncertainty from many directions – political, financial, regulatory.

And yet, I’ve had the good fortune to interview many CT(I)Os and senior execs from some of Europe’s largest operators this year. Many have also spoken at our events. There are two things that always strike me, no matter how different their personalities and approaches are. First they are nothing daunted despite the scale and number of challenges they face, rather they tend to be full of enthusiasm and good humour.

Second, how much what we are talking about has changed. Somewhat counterintuitively, because we watch the industry so intently, change sometimes is imperceptible. In my most recent interview, I asked a CTO if a decade or five years ago he could have imagined the evolution of the network he had just been describing. No, he said, but in his view our industry is all about ambition, innovating and staying relevant to customers’ need in the era of hyperscalers.

On that note, we hope you enjoy MWC 2024.
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Telecoms’ tectonic plates: big trends that are shaping telcos
The operators who emerge from this decade in a stronger position will be those who manage, somehow, to read and ride the political, policy and technology waves at the same time as running their businesses
Telcos must maximise their return on network investments, but this is difficult when services are sitting across multiple domains. They must also minimise opex while running legacy and next-gen services. Mobile Europe asks Amdocs’ intelligent OSS GM Eyal Shaked and Menny Konorty, VP and the head of OSS product management, how operators can best leverage network investments? For example, exposing network capabilities to customers and hyperscale marketplaces.

They also discuss how end-to-end service orchestration (E2ESO) now uses an intent-driven approach to capture high-level business objectives and translate them into network actions.

With the ongoing network transformation we see around us, what are the main challenges you see for communications service providers (CSPs) to overcome?

Eyal: Network complexity is rising with the move towards programmable, software-based networks, which are disaggregated, heterogeneous and hybrid. This increases operational complexity which CSPs can’t manage with existing people, processes and systems. At the same time, customers are demanding personalised, innovative and faster services that go beyond connectivity.

As a result, we’re seeing additional services and operational processes requiring more and more automation and the integration of information from the many in-place systems in each technology domain. In parallel, CSPs are carefully controlling their capex and opex, looking into automation to overcome this.

Menny: It’s a paradox that as the network becomes software driven and programmable you achieve cloud native transformation, but in parallel you need to maintain existing, traditional network services like IP, Ethernet and 4G. Operating this hybrid mode is super challenging. CSPs need their OSS to cope with legacy and next-gen services running across multiple domains and siloes.

You mention automation, but how exactly can automation help CSPs?

Eyal: CSP customers are demanding simpler interactions where they can express what they want and a desired outcome – we call this “business intent”. Intent means you don’t have to guide the service orchestration exactly step-by-step but just specify what your desired end goals are. The service orchestration solution should dynamically navigate towards this end goal. CSP services then become intent-driven by design; able to translate customers’ desired outcomes into a set of well-orchestrated actions that are dynamically executed.

The second foundation of automation is “closed loop” operations. An open loop system would do root cause analysis on a fault and report the reason to a person for resolution. Closed loop independently takes automated actions to resolve issues. Predictive analytics can be leveraged to prevent incidents even before they impact.

To achieve closed loop we’ve integrated the network monitoring functionality with the E2ESO. Through this
integration E2ESO observes the network and services status and then decides on the optimal actions to be applied.

**Menny:** In autonomous operations, the network, OSS, and AI work together to provide zero-touch, zero-wait and zero-trouble services, requiring automated end-to-end process flows across what used to be multiple, siloed OSS functions. You can only achieve this by increasing the level of automation and having constant observability. They ensure service intent and work in a predictive manner to avoid issues.

CSPs must integrate information from the many in-place systems in each technology domain with their existing OSS components to provide end-to-end, intent-driven, closed-loop automated operations processes.

The automation and orchestration of these actions, if done appropriately through the implementation of AI and ML, will enable CSPs to control costs in an environment where network complexity is growing. The fact that you also then have a programmable network that you can open up and expose is a great opportunity for monetisation.

For example, as part of TM Forum’s Catalyst program at Digital Transformation World, we won an award for the Simple Hyperscaler Integrated Network Experience (SHINE) Catalyst with AT&T, Orange, Telefónica, Microsoft and others. This proof of concept demonstrated how we can orchestrate and expose the Network-as-a-Service (NaaS) and enable CSPs to provide API packages globally, through hyperscaler portals.

**You mention TM Forum, are we seeing a coherent set of standards and standard APIs emerging for CSPs?**

**Menny:** Definitely. Openness and standards alignment are critical since the business intent must be delivered and maintained for end-to-end services, which span domains, technologies and vendors. OSS standards defined by the TM Forum and MEF are augmented by the GSMA’s Open Gateway Initiative.

This builds on the LINUX Foundation’s CAMARA project to define a set of simple, north-bound APIs to expose telecom network capabilities to third-parties. Leveraging TM Forum’s Open Digital Architecture and aligning to other standardisation initiatives means we’re seeing the emergence of an operator-agnostic framework to standardise the customer journey.

Amdocs is already driving industry standards from TM Forum Open APIs – we are implementing APIs in the OSS domains for ordering, provisioning, activation, service qualification, inventory and so on, as well as 3GPP standards for slicing management and transmission standards for transport. We can use these standards-aligned APIs and adjust to the different vendors the CSP may have in their networks.

**What are the key characteristics of this new, intent-driven wave of automation?**

**Menny:** Intent-driven automation is all about not needing to predefine multiple processes that cater for different scenarios and then trying to hard code all these permutations of processes and behaviours. This is time consuming and not scalable. Instead, the system works out what needs to be done to deliver and maintain the customer’s desired outcome: for instance, a connectivity service supporting live transmission of HD video or ensuring the right QoS for a 5G slicing service.

The intent can require multiple characteristics like latency and throughput or even financials like least cost routing. These are funnelled into the intent engine, the brain of the orchestrator, which automatically ensures this intent is always maintained in a dynamic manner. This so-called “brain” is a dynamic model that captures the entire set of components, like Lego blocks, of resources and network functions that compose the services and their permutations. The intent engine knows according to the model, constraint policies and AI/ML insights, which permutation and combination can satisfy which intent.

For example, if you have a gaming service and you’re starting to experience latency issues, the intent will notice the latencies degrading service and will automatically place UPF at the edge instead of the core data centre. It applies AI and ML to optimise service delivery and predict anomalies, pre-emptively resolving potential service impacting issues. That’s just one example of many that we can support.

**Eyal:** All of this is based on AI and ML as otherwise CSPs would have too many permutations to deal with. The only way to do it is by having the ability to understand the previous behaviour of the network and to predict in advance. At MWC 2024 we will be showcasing a Generative AI-based (GenAI) demo that combines all of this.

We’re combining GenAI based dialogue and a fine tuned large language model (LLM) with our telco-specific amAIz framework. We can access data from the business layer all the way down

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“**Intent can be multiple things like latency and throughput or even financial things like least cost routing. It can relate to specific vendors or a specific type of consumption that you need to use.**
to the network to enhance automation, all leveraging this amAIz framework to solve AI Ops.

Do you have examples of customers who are embracing E2ESO and what role does service assurance play?

Eyal: With the recent acquisition of Teoco’s Helix service assurance, we enhanced the capabilities of our Intelligent Networking Suite (INS), and continue to support our customers’ needs across traditional and next generation services such as SD-WAN and 5G network slicing. Helix service assurance augments INS into an AI-powered end-to-end intent driven, closed-loop network automation solution.

This means that orchestration, inventory and assurance work in harmony to guarantee the “business intent” and automate operational processes like root cause and service impact analysis and proactive assurance.

As 5G Standalone (5GSA) is rolled out, we have also implemented our E2ESO solution to act as a 5G slice manager across domains from RAN to core. For example, with A1 Telekom Austria we implemented our solution in a proof of concept to demonstrate the E2E lifecycle management of 5G network slices as well as edge applications in a multi-cloud environment.

Menny: With VodafoneZiggo we are orchestrating predominantly B2B services for voice, UC, smart connectivity, SD-WAN and campus Wi-Fi. These and multiple other complex services with multiple elements are now managed through their NaaS layer built on our E2ESO. It enables the exposure of capabilities to end users, customers and operational teams to do things on their own through a self-service portal. This reduces cost and shortens the time to change services or resolve issues.

We’re also running several 5G SA trials. We have a Tier One North American carrier running advanced trials around slicing for broadcasting. Satellite operator SES is running an end-to-end OSS solution combining assurance, inventory, orchestration and fulfilment. SES combines its low and middle Earth orbit (LEO and MEO) satellites with our orchestration, offering E-LAN, metro-Ethernet based services. The next stage we are working on with them will be called “Network Slicing in the Sky”, in partnership with Microsoft Azure.

In summary, in our engagements with CSPs, we do see that the journey towards increasing the level of automation is accelerating. After significant investments in rollout and spectrum, there is general consensus that automation is key for CSPs’ to best leverage their new network assets and progress to success in the digital era.
Colt: a unique take on acquisition, culture, collaboration and partnerships

Keri Gilder, CEO of Colt Technology Services, talks to Annie Turner about the company’s milestone year, AI and network architecture, NaaS, collaboration and much more

“Very few companies take the culture piece of it seriously when it’s actually the only thing that matters.”
Keri Gilder has been Colt Technology Services’ CEO since May 2020, and before that served as its Chief Commercial Officer from 2018. In November 2023, Colt completed its acquisition of Lumen’s business and assets in Europe, the Middle East and Africa (EMEA) for €1.65 billion ($1.8 billion), making 2023 a milestone year.

Colt’s business model is unusual in that it is B2B only. Between 65 and 70% of Colt’s overall business is directly with enterprises. The rest is split between strategic wholesale players. Some are other network operators, others global content players and hyperscalers. The acquisition brings Colt 2,700 customers including blue chip corporations, enterprises and public sector customers. Colt will expand its coverage via PoPs in Dubai, Estonia, Greece, Iceland, Israel, Kenya, Serbia, Slovenia, South Africa and Turkey.

Gilder herself is a trailblazer, most obviously because few women head up telcos, although that cohort is growing rapidly.* Also, she prioritises company culture, which at this juncture is critical. She notes that only about 5% of mergers are really successful “because very few companies take the culture piece of it seriously when it’s actually the only thing that matters”.

She has long been a strong advocate for diversity and inclusion as critical success factors in telecoms (and beyond) and acts on her conviction. For example, she was appointed chair of TM Forum’s Diversity & Inclusion Council in 2020 and we began our interview with Gilder talking about teaching culture courses for the Pacific Telecommunications Council (PTC), including for younger people entering the industry.

Sending signals

She says she’s learned “a lot about what culture is – and isn’t.” I love David Foster Wallace’s analogy of two young fish being asked by an older one swimming by, “How’s the water?”. One youngster looks at the other and asks, “What’s…water?”. Culture, like water to the fish, is fundamental, yet we are mostly oblivious to it and its profound importance.

This is why, as Gilder says, “it’s the hard stuff...You can write a mission statement...you can put your values up there, but...if you don’t follow them, they’re meaningless.” She adds, “You can put the ping-pong table and cafe in the basement but it’s the signals you send out around decision making, how you react in certain situations, who you listen to within an organisation for direction – whether they are in the hierarchy or not – those are the things that matter.”

Ahead of the Lumen acquisition, Colt carried out a culture survey. She was “pretty proud” that more than 5,000 people within Colt filled in the survey and scored more than 33 points higher than the highest performing companies. Gilder states, “So I feel like we figured it out on the Colt side, now, we ‘just’ need to make sure that we take that magic formula and take into consideration the good stuff on Lumen’s side and bring it over, making sure we blend it in, in some form or fashion.”

Scale and collaboration

Why did Colt acquire Lumen’s EMEA operations and assets? Gilder says, “In an ever more commoditised environment, when it comes to connectivity scale matters. This...makes us the largest pan-European B2B fibre operator and one of the largest B2B-only operators in the world. So, from a scale perspective, there’s a lot of value and leverage we’re going to gain.”

Another major attraction was Lumen’s Tier 1 autonomous platform which Colt now co-owns. Gilder says, “So the second piece, beyond scale, is collaboration. That and the platform are driving a true partnership with Lumen in North America and with other operators around the world because it provides us with something like 300 million BGP [border gateway protocol] peering points globally.

“This gives us a lot more capability to reach different areas outside EMEA. I think that’s going to be important, especially as AI comes to the mix and the IP points become very important from a wholesale...and an enterprise perspective.”

AI’s impact on business and the network

What impact will AI have on Colt’s business and assets? Gilder says, “I think that [some] people are claiming expertise where they shouldn’t. I definitely don’t claim to be an AI expert, but what I do know is that AI requires a different network architecture than we have today. So we’re starting to think about that very differently. Our strong feeling is that AI requires what I’m coining [the term] a hypermesh, metro environment.

“It requires a lot of capillaries to various points. Where those peering points come in as IP addresses, there’s data that can be used in an AI learning environment – a large model language environment or narrow language environment, whatever it is. Number one, we have to think about the scale of the BGP peering points but we also have to think about fibre’s scale to the points, to get connectivity to where it needs to be in a low
Edgy predictions?
The edge has proved elusive and progress much slower than expected. Gilder states, “I think AI will be the catalyst for edge... Probably in first instance, it will be deployed in a private AI way, where you have hosted applications at an edge, which could be a colocation site of a network. It’s possible, wherever you have power could be an edge and applications – or data – could be hosted there. That’s how we have to think about it.”

Gilder believes that pharmaceuticals “are a perfect example” of an edge use case because “you have lab tests and lab environments going on all over the world. You’re going to need big data centre to crunch the data, but you’re also going to need a certain proportion that you can use in your labs that should be closer. Companies will have to work between the two.

“We’ve already seen that with some of the protein work that AstraZeneca did during COVID. So that’s one example, but I think there are many.

“Companies are going to choose portions of data and where they reside based upon native use associated with a particular data lake or sub-lake. I think it’s more sustainable from an environmental perspective. It helps us to meet some of the ESG [environmental social governance] requirements we have, and to hold ourselves a little more accountable than we currently are.”

Formal participation in ecosystems
While Gilder talks up collaboration and partnerships, Colt is not so involved in the GSMA’s Open Gateway initiative because “it’s more about mobile operators” but it is engaged with TM Forum and more recently MEF [formerly the Metropolitan Ethernet Forum], looking at Network-as-a-Service and how it can be served as a platform via multiple operators.

*Other female trailblazers
- Allison Kirkby served as CEO of TDC then Telia, and now is CEO of BT Group.
- Margherita Della Valle is CEO of Vodafone Group.
- Serpil Timuray is CEO Europe Cluster, Vodafone Group. Patricia Obo-Nai, the Chief Executive Officer of Vodafone Ghana.
- Christel Heydemann is Group CEO of Orange and Aliette Mousnier-Lompré CEO of Orange Business.
- Mapula Bodibe heads MTN Rwanda, Sylvia Mulinge leads MTN Uganda, and Mitwa Ng’ambi oversees MTN Cameroon.

The list is not intended to be exhaustive.
She notes, “These discussions are happening. On paper, they look really good and I do think there’s a need for them but the question in my mind still is that I’ve been working with various operators for almost three years now and thinking about a larger open platform and how that could work.

“But there still seems to be this very strong desire to control the narrative by various operators that it seems really difficult to get past. Technically, we could roll it out today; commercially it becomes very, very complicated.

Three is a magic number
The third big gain for Colt from the Lumen acquisition is the capabilities of Lumen’s EMEA staff, according to Gilder. Colt has purchased 10 transatlantic subsea systems and 11 landing stations, which are new assets and businesses for Colt to manage. “These, combined with the massive fibre infrastructure we have for backhaul, we will be able to accommodate the 70-plus cable systems that are going to be connecting into Europe, the Middle East and Africa over the course of the next seven to 10 years,” she says.

“There’s a big impact on Europe, Middle East and Africa, specifically Europe, because that’s the most dominant portion of the combination. But with the subsea systems and the Tier one [platform] and the strategic partnerships we’re building, the impact goes way beyond the EMEA area, into North America and deeper into Asia than we’ve been before,” Gilder says.

Largest growing market
Asia is Colt’s largest growing market. She says, “If you look at it, just from a revenue perspective, we’re still growing at a very strong rate. Specifically we have a strong presence in Japan.” Colt and KVH – the Tokyo based cloud and data centre service provider – were both founded with investments by Fidelity Investments and associated companies. Colt acquired KVH in 2014 and continues to expand fibre infrastructure there. It recently announced it would build out into west Japan, as it seems more manufacturing will take place there.

Gilder adds, “We’re continuing to look at opportunities in the rest of Asia. Right now we’re concentrating on getting this right, that we get the integration right, but we are investing organically in the region. We are further developing some strategic relationships and partnerships as well, to ensure that we have access, whether it be in Indonesia, Vietnam, Australia or elsewhere."
Broadband reliability is the key to success in consumer markets

As broadband providers grapple with low take-up rates in some countries, two surveys cast light on what consumers want and what operators are doing about it
The take-up rate of fibre broadband is about 50% on average across Europe, although it varies considerably from country to country (see graph), as does fibre penetration. As inflation bites, it becomes harder for network operators to attract new investment and more expensive to renew loans.

The focus is shifting to take-up as operators need return on investment. Also, existing and potential investors, and shareholders are scrutinising adoption rates as well as roll-out strategies.

So what can operators do to improve the rates and how well do they understand what consumers want? Research published in late 2023 by analyst house Omdia in conjunction with Broadband Forum found that 72% of the 111 telcos it interviewed are prioritising bandwidth within the broadband to the most demanding applications like video streaming and gaming.

Broadband Forum’s Vice President Strategic Marketing and Business Development, Craig Thomas, said, “In the future, delivering a great broadband experience will be less about speed and more about providing value-added and tailored services to the end customer. Open standards can deliver the sort of service-aware and application-appropriate network capabilities that can help providers improve their products and provide customers with greater user experience.”

Reliability matters most

This is an encouraging, given the findings of a EY’s most recent, annual Decoding the digital home study. It surveyed more than 21,000 consumers across eight countries. People from Canada, France, Italy, South Korea, Spain, Sweden, the UK and the US were asked about their attitudes to technology, media and telecoms experienced in the home.

Adrian Baschnonga, Associate Director at EY, Global Technology Media Telecos (TMT), told Mobile Europe, “The speed message doesn’t resonate that well with customers…there’s a lot of apathy around speed; they clearly want something that works.” He says that when customers are asked the speed of their broadband, up to four out of every 10 don’t know.

This year EY added a question to its survey, asking what consumers consider the single most important improvement

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**European ranking of fibre penetration and take-up rates**


Note: Subscribers and homes passed figures are shown as a percentage of total households
their broadband provider could make? Reliability was the clear winner, which is interesting in the midst of a cost of living crisis across most countries.

The EY survey found performance promises are among the top attributes people look for in a broadband provider, along with performance of the Wi-Fi within their homes, the quality of the router, technical support and transparent, easy to understand pricing.

Wi-Fi quality in the home
Baschnonga says that year-on-year, the survey’s findings are “fairly consistent” about people experiencing performance issues like buffering, although figures are improving “slightly”, with people experiencing them less often. However, he says there is “a stubborn rump” that is not seeing improvement.

This could be caused by many issues. For example, the construction of the building, and how and where customers set up routers. He adds, “Also, [retail broadband] is a market where a number of retailers...are buying wholesale off another provider; questions can arise about whose responsibility [performance] is from the service providers’ perspective” – see panel on opposite page.

Predictable pricing
While respondents to the EY survey were not planning to cut back on fixed broadband, a large proportion (more than 70%) want fixed price guarantees.

He says, “The demand for connectivity...that became front of mind during the pandemic...has endured.”

Many are wary, though, of what Baschnonga calls “inflationary escalators” built into contracts in many countries. This might be about to change, however. For example, there was a public outcry in the UK about a number of operators’ price rises last March.

Using the model set out by regulator Ofcom, BT increased fixed and mobile prices by 14.4%, based on the December 2022 Consumer Price Index plus 3.9%. This formula looks likely to be dropped by Ofcom in favour of operators stating how much in-contract price rises will be in pounds and pence when consumers sign up. Even before Ofcom made a final decision, BT said it will adopt this approach.

The fact that operators must also cover the cost of upgrading the network cuts little ice with consumers although “That’s certainly something that’s part of the dialogue between service provider and regulator,” according to Baschnonga.

Bundles become attractive
The EY survey found that some respondents reported they had already deployed value-added services

Source: Omdia/Broadband Forum, The future of the connected home and the rise of home applications, published October 2023

Respondents reported they had already deployed value-added services

Consumers mull moving to mobile
EY’s survey found that just over a third (34%) of households said they were potentially interested in dropping fixed broadband service in favour of mobile. However, although they might be considering this with cost in mind, they are very conscious about what kind of performance they would get and if it would match fixed broadband.

The same attitudes are true for customers mulling replacing fixed lines with 5G fixed wireless access (FWA) – some customers might opt to replace fixed with FWA. At the time of the survey, there were 94 operators globally offering FWA.
respondents were becoming more receptive to having other services bundled in with connectivity. Baschnonga said, “We saw an uptick in in a number of categories across markets…like packages that include certain kinds of content, or maybe smart home, for example. I wonder how enduring that trend will be. Is it something we’ll see accelerate going forward?”

These findings were confirmed by Omdia’s report from the operators’ point of view – see the graph on the opposite page. It found many broadband service providers are already offering value-added services around basic connectivity. Over the next 12 months and beyond, operator respondents said they will look to offer premium services beyond those related to the connection itself.

Options include home security, working from home packages, energy management, and IoT enablement through the new Matter standard, launched last autumn. It was created by Amazon, Apple, Google, Samsung, Verizon and others through the Connectivity Standards Alliance.

Home broadband, Wi-Fi speed and reliability guarantees, and speed testing and diagnostics were among the most popular value-added services telcos plan to offer. More than half (60%) of respondents stated they are already deploying some of them but managed Wi-Fi, premium customer support, voice assistants and cybersecurity feature heavily in many respondents’ plans.

Progress with smart homes?
According to the Omdia report, 85% of respondents said they had already deployed the Broadband Forum’s User Services Platform (USP) or plan to within the next six to 18 months. USP was developed to help deploy, implement and manage the smart home. It includes a data model, architecture and communications protocol to support the remote management of devices, such as Wi-Fi home gateways, independent of the device’s manufacturer.

More than half (58% of respondents) said they use or will use USP to manage Wi-Fi. Other popular uses include premium customer support, cybersecurity, voice assistants, and energy management.

All respondents agreed that reduced fragmentation and proprietary technology at the chipset, customer premises equipment and software platform level would drive greater innovation. They also thought it would lead to faster onboarding of value-added services.

Michael Philpott, Research Director – Service Provider Consumer, at Omdia observed, “A key barrier of time to market for new services from network operators has been the integration time with devices and platforms that may use different vendors and proprietary technologies. “Some network operators may opt for a ‘best of breed’ strategy to develop their own, bespoke, in-home platform to take full control over the ecosystem they create and give them the best chance of differentiation in the market.

“Adopting a fully open standards model at both the lower and higher layers can ensure that both applications and software, or hardware and chipsets can be quickly and efficiently swapped out at any time without the need for further integration work.”

Improving interoperability for better in-home ops
In December, three vendors became the first to undergo interoperability testing for the Broadband Forum’s virtualised optical network unit (ONU) management and control interface or vOMCI standard (TR-451).

Operators’ optical line terminals (OLTs) connect to the ONUs to help manage end users’ connections. The ONU converts the optical connection to an Ethernet link which are typically supported by consumers’ routers. Put another way, the TR-451 standard decouples the ONU and the OLT by virtualising the OMCI software.

The standard is intended to make it easier for operators to deliver new services to and within customers’ homes, using products that have been tested and certified as compliant. The testing took place at a plugfest that ran from June to September last year at Altice Labs. The three vendors taking part were MT2, Nokia and Radisys Corp.

The Broadband Forum is calling for others to contribute to this work.

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Unveiling valuable insights for business growth

Miguel Raposo of Celfocus explains how data monetisation has become a critical strategy for CSPs to thrive in the digital age.
In today’s digital landscape, data has emerged as one of the most valuable resources, revolutionising industries and transforming the way businesses operate. Communication Service Providers (CSPs) are no exception, as they navigate a rapidly evolving market where traditional revenue streams are being reshaped.

By moving beyond traditional connectivity and enabling innovative digital technologies on 5G, IoT, cloud and edge services across industries, CSPs are helping business customers progress and thrive towards a better-connected future and digital society. Further to the investment in next-generation connectivity, CSPs are investing in Big Data capabilities to enable data-driven insights based on the vast amounts of data flowing through their networks.

With the CSPs aggregating access to 5-8x more user data with their service subscribers than any other internet company, differentiating use cases can be delivered to improve business. Not only does every smartphone run on a CSP network, but a significant part of IoT devices does as well. Location-based data, mobility insights and IoT analytics, which can be provided or supported by CSPs, represent a ground value for use cases benefiting businesses with revenue gains or efficiency improvements.

By extracting meaningful patterns, analysing trends, identifying correlations, and predicting future outcomes, CSPs can help their clients make informed decisions that drive growth and innovation, find customers where they are, and enable their offerings to meet individual needs, thereby boosting customer satisfaction and loyalty.

The ability to transform raw and anonymised data into valuable insights and products presents new opportunities for CSPs to thrive in a data-driven world. As we move forward, the organisations that harness the power of data will undoubtedly stand at the forefront of progress.

Case study: *Vodafone Portugal enables data monetisation for enhanced decisions*

Vodafone Portugal wanted to understand the mobility of the huge flux of people expected in Lisbon during World Youth Day (WYD) 2023 – a global event that brings together young people from various countries and cultures to celebrate their faith in the Catholic Church. The operator’s goal was to share the insights generated daily with the media and public, showcasing the potential of Vodafone Analytics – a Big Data solution capable of...
making business and strategy decisions with insights collected from millions of mobile customers.

The solution
Celfocus partnered with Vodafone Analytics team to develop a portal containing multiple dashboards, with the objective of showcasing the usage of mobility data (event attendance, mobility patterns, visitors’ footfall and segmentation, etc) to different customer industries and segments during the WYD.

The Celfocus team’s first challenge was to define which insights dashboards would be interesting to explore. To achieve this, segments such as Tourism, Events, and Retail were defined. Once this cluster of insights was implemented, the team started to analyse the raw and anonymised data collected by the Vodafone network, particularly in WYD’s areas of influence, trying to find interesting details about what was happening during the event.

This process in particular proved to be complex as the event took place in different locations. Managing all the details of each location, as well as the general WYD agenda, was a great challenge.

Analytics metrics and insights
The distinctive proposition of selecting engaging analytics metrics and insights also set this project apart while introducing a new challenge: the team had to be creative in choosing measurements that caught the public’s attention and were different from the usual ones.

Thus, one of the team’s main objectives was to try to find relevant patterns that the public was unaware of, while showcasing to companies the potential of knowing these same patterns and insights to boost their own businesses. That is because, by knowing how potential customers move around, companies could offer their products and services more effectively.

The Celfocus team consisted of business analysts, user experience and user interface specialists, architects, data scientists, and front-end experts. The Vodafone team comprised go-to-market, brand, and Big Data specialists. The teams worked closely together to plan and sometimes re-plan the datasets to be analysed. Throughout the project, some changes and adjustments were necessary in order to obtain the appropriate information.

New insights
The result of this data analysis went beyond the usual reports with static information. The analytics dashboards were interactive, allowing the exploration of data freely so that the information could be filtered, segmented and/or related in a way that the users could get the insights they were looking for or

![Map of Portugal with main national visitors data](image)

**Insights highlights**

- +190 different nationalities detected
- Main international visitors coming from Spain (24.4%)
- Main national visitors coming from Setúbal (31.2%)
- Parque das Nações was the top place to have lunch (10%)
- 10% of Lisbon inhabitants left the city mainly to Loulé (6.4%) and Albufeira (3.4%), in Algarve

![Map of Portugal with main national visitors data](image)

**Main National Visitors***

*Excluding Lisbon since it was impossible to differentiate pilgrims from inhabitants*
Basic data alone does not provide all the information available. It was essential to have a processing phase, that is, combining the data to obtain more complex and valuable insights. This includes visitors’ flow trends, their demographic characterisation and location, and behavioural patterns of mobility.

In terms of operationalisation, Vodafone Analytics – a solution developed by Vodafone in partnership with Celfocus – collected and interpreted data from the mobile network in Lisbon, throughout the entire week of the event. The platform was automated so that the Celfocus team could receive data from the event on an hourly basis.

Afterward, the data was organised according to specific metrics, since all information sent by Vodafone was anonymised. Once organised, the data was automatically ingested into the platform and placed in the Celfocus database, where the analytics dashboards were generated.

Leveraging Google Cloud, Celfocus set up the required data modelling, data ingestion and processing. Then it created and embedded rich analytics visualisations into a web application, easing user experience for vertical industry use cases.

With this project, Vodafone Portugal and Celfocus successfully implemented a data monetisation revolution through groundbreaking technology, transforming raw and anonymised data into actionable insights, for well-informed decision-making and security & operational effectiveness.

Miguel Raposo is Head of B2B2X Offer Development and Innovation at Celfocus. He has more than 13 years’ experience working across BSS, OSS, digital, analytics and AI projects for telcos. This includes in B2B, wholesale and network & customer service operations. His current role leverages his cross-functional and technological view, allowing him to understand telcos’ reality holistically and to help create valuable solutions to improve their business and operations.

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In January SpaceX launched its first six Starlink low-Earth orbit satellites (LEOs) intended to provide direct-to-device (D2D) communications. It has since sent and received the first text between mobile devices using T-Mobile’s network spectrum. The company is leading the LEO pack, suggesting it is “uniquely positioned to rapidly scale” even as China preps its own mega-constellations and Amazon Kuiper looks to move beyond two satellites.

However, Enrico Ottolini, Co-founder and Executive Director of consultancy Planet Earth Connect, says that although the key LEO companies cover a substantial part of the whole 5G service spectrum, their focus on competing with each other is hindering their ability to address the needs of enterprise clients. “They are making a challenging market more difficult,” he adds. “Terrestrial network operators want 5G Non-Terrestrial Network (NTN) services to provide seamless coverage extension of their existing connectivity solutions.”

Geopolitics and LEO firms
As geopolitical tensions have worsened, Ottolini believes competition for geopolitical and geo-economic global dominance is intensifying between each general faction. This is especially true of regions in the ‘global south’ which represent a large part of future revenues anticipated by most LEO operators. “China is developing its own LEO systems as an alternative to the initiatives from the US, Europe and Japan,” he says. “As such, it is likely that China and Russia will leverage their strong relationships with the governments in the global south to favour the market entry of the Chinese system.”

Consider the growing twofold civilian-military use of LEOs, China’s strong financial presence in many emerging markets and its political position. Then the fact that many developing countries depend on Russian energy. These factors

Competing LEO constellations are not helping mobile operators

The 5G non-terrestrial network (NTN) market must overcome some big challenges before mobile operators can embrace it.
are likely to make it difficult for Western LEO operators to offer their services in these countries.

Consequently, arguments about terminal and service costs aside, Western LEO firms could be better served looking to untapped enterprise markets.

**Big barriers**

Ottolini reckons this won’t be straightforward for several reasons. “LEO operators have mainly based their services on proprietary solutions,” he says. “Because each company is developing its own solution to compete with rather than complement the rest, this will complicate service consistency for enterprise applications across different complementary LEOsat constellations.

“It will lead to a wide variety of deployment models and architecture for the integration with terrestrial cellular services.”

The reason for this lack of standardisation is the rather limited scope of 3GPP’s Release 17 which Ottolini said should have set the standards for 5G TN/NTN multi-connectivity. “However, it is limited to only transparent satellite access nodes,” he explains. “This excludes any regenerative capabilities to compensate in the NTN 5G Core Network and RAN for satellite-related issues such as long propagation delays, large Doppler effects, rain fading and so on.”

As a result, he said, Release 17 will at best facilitate interworking between 5G TNs and NTNs. But that leaves full TN/NTN multi-connectivity for future releases 18, 19, 20 and so on, which will eventually set the required standards from 2026.

Constellations will be launched and become commercially available long before that date. Each D2D LEOsat provider will develop and implement its own separate, proprietary and dedicated core network and RAN solutions. And every one will be best suited to making their own services connect seamlessly with unmodified 5G user equipment.

**Can you hear me?**

The second, related challenge Ottolini sees is service fragmentation. “The specific 5G frequency bands and satellite design used by the different LEOsat operators put different requirements and limitations on both user equipment and the services,” he says. “Therefore, each of these systems is more suitable to offer services only in a specific part of the whole 5G services spectrum.”

Spreading this globally, you see the complete range of LEO services is divided among three or more different operators, each focusing on a limited part of the whole 5G services spectrum. At the same time, terrestrial mobile operators will typically provide a complete range of services.

**Critical requirements**

“As these are critical requirements for large-scale enterprise deployments, and essential for the financial feasibility of these new LEO satellite systems, this approach will not work,” he adds.

Ottolini believes if these challenges are not resolved, mobile operators, system integrators and global enterprises looking to complement their entire range of terrestrial 5G services with LEO services will have to source the different LEO satellite services from different satellite operators and connect with the specific systems of each. The reverse is where the industry should be heading.

“This will be both extremely inefficient and costly, leading to a delay in quick market adoption of LEOsat services by these distribution channels,” he concludes. “Consequently, this will hinder the LEOsat operators from reaching the economies of scale and obtaining additional revenues from high-value enterprise clients for premium services, both of which are likely necessary to bear the huge costs of their constellations.”

Enrico Ottolini is co-founder and executive director of Planet Earth Connect, a consultancy and LEOsat/HAPS Network-as-a-Service platform provider.
The World Radio Conference 2023 (WRC-23) concluded in December and was attended by more than 3,900 delegates from 163 countries.

The World Radio Conference 2023 (WRC-23) is held every four years under the auspices of the International Telecommunication Union (ITU), itself part of the United Nations.

The most recent took place at the Dubai World Trade Centre in Dubai and concluded in December.

The WRC-23 is a treaty conference, meaning it can change international regulations on the use of radio spectrum for different services, including mobile, which in ITU parlance is International Mobile Technologies (IMT). All kinds of service providers and technology companies look to its outcomes for certainty in investment and planning, although the decisions made here are just the start of the process.

Regional and in-country regulations must be put in place before the spectrum finally becomes available for services, mindful of factors like their own and neighbours’ existing usage rights.

Perhaps one of the most eagerly awaited outcomes of the WRC-2023 concerned the use of 6GHz spectrum.
for 5G and 6G. Spectrum for 6G will be an even hotter agenda item at WRC-27 as the expected but unspecified deployment time of ‘after 2030’ grows closer. With this in mind, WRC-23 also approved the study of the bands 4400–4800 MHz, 7125–8500 MHz and 14.8–15.35GHz for IMT.

6GHz complications
The outcome regarding the use of 6GHz for 5G in the shorter term was celebrated by the mobile industry. The GSMA said in a statement as the conference concluded, “The WRC-23 decision to harmonize the 6GHz band ... is a pivotal milestone, bringing a population of billions of people into a harmonized 6GHz mobile footprint. It also serves as a critical developmental trigger for manufacturers of the 6GHz equipment ecosystem.”

In fact, the situation is not clear cut. For one thing, the ITU’s IMT identification (ITU-speak for allocated to) for the Upper 6GHz band in all regions is limited to just 100MHz, between 7025-7125MHz.

Consequently, it is not accurate to say, as some commentators have, that the entire Upper 6GHz band was identified across all regions for mobile. In Regions 2 and 3 (see map on page 26), only Brazil, Mexico and Laos, the Maldives and Cambodia, were identified for the 6425 to 7025MHz section.

Growing support
There appears to be growing support for IMT in the 6GHz band by other countries but some were prevented from joining the IMT identification by concerns from neighbouring countries. Mobile supporters hope this will shift at WRC-27 as a result of more study.

For now, countries’ and regions’ policies regarding the use of 6GHz vary, for instance:
• the US has made the entire 6GHz band unlicensed and available for Wi-Fi
• China has opted to use it for 5G and 6G
• India remains undecided
• Europe will study the viability of Wi-Fi and IMT sharing the spectrum during 2024 and 2025, with a final decision expected in 2026.

Nevertheless, as Eiman Mohyeldin, Global Head of Spectrum Standardisation at Nokia, explains, “The upper 6GHz is for 5G Advanced technologies and Europe, the Middle East and Africa has 700MHz allocated to this.

“We welcome and are very thrilled by this outcome because it will be additional resource allowing us to add new applications and features... operators can extend their resources and offer all those things we dreamed about [when 5G was mooted]. It’s all about how can we get data in a very speedy way.”

Even the Wi-Fi Alliance, which had lobbied for 6GHz to be given over for unlicensed use by Wi-Fi, was chipper, presumably as potentially sharing the bandwidth in Europe is better than no bandwidth in the upper register of 6GHz.

The low(er) down
There were more moves to harmonise the use of ultra-high frequency (UHF) spectrum in the 470-694MHz band. Lower frequencies are helpful for wider area coverage in rural areas rather than for boosting capacity. There was a secondary ruling regarding its identification for mobile in Europe (Region 1).

Mohyeldin explains that the secondary ruling means that Europe can deploy IMT once the decisions on the future use of the UHF band are made within the continent. The planned review of the TV broadcast’s use of the band should conclude in 2025. In the meantime, Italy and Spain are still using it for broadcast.

There are also issues about using the band close to the Russian border and the border with Belarus, as it is used for other purposes there and could cause or suffer interference. Hence the spectrum can be used for mobile, but the bandwidth is not ‘protected’ for mobile’s exclusive use.

Eleven countries in the Middle East were allocated 614-694MHz for mobile on a primary basis. This means there are strict conditions attached to its use and careful coordination is needed for use close to the border with Iran.

Some African countries like Nigeria, Namibia, Senegal, Ghana and Somalia, also wanted primary allocation of the 600MHz frequency, but it was not possible to coordinate this due to neighbouring countries’ issues. There will be further discussion of this for African countries at WRC-31.

Satellite generations collide
The was some manoeuvring among operators of the new low earth orbit satellite systems (LEOs) and the owners of older constellations operating in higher orbits.

These new kids on the block and other LEO operators want a relaxation of the Equivalent Power Flux Density (EPFD) limits that dictate how much power LEO operators can use to
transmit signals. This is to prevent interference with those in higher orbit, like fixed satellite operators ViaSat and SES.

The LEO constellation operators complain that the regulation is outdated and that modern tech means more power would generate more capacity for customers without affecting the geostationary orbit operators (GEOs).

Diverse but united opposition
Not everyone is convinced and interference with the GEOs is not the opposition’s only concern. The proposal was opposed by Brazil, Indonesia, Japan and others. They are concerned about the dominance of newer mega-constellations – the ethereal equivalent of hyperscalers – in terms of potential spectrum-grab and undermining the huge investment sunk into the older ones.

As Peggy Hollinger wrote in the Financial Times, whether parties were objecting on competitive, sustainability or security grounds, they formed a formidable opposition. Proposals to review the rules at the WRC-2027 were denied but permission was granted for technical studies of how power limits could be changed to proceed. If they are successful, it would be hard to see how rule changes could be denied.

In that case there would be genuine reasons for concern that operators from the world’s most wealthy companies (and countries) would focus on profit rather than the common good. And the alarming potential of allowing a handful of billionaires to control constellations, such as to intervene in wars.

Elon Musk allegedly caused Starlink satellites to be turned off during a submarine drone attack by Ukraine on Russian warships in 2022, causing the offensive to fail. He reportedly opposed inflicting a “strategic defeat” on the Kremlin.

According to the biography of Musk published in 2023, written by Walter Isaacson, Musk asked the author, “How am I in this war?” in an interview. “Starlink was not meant to be involved in wars. It was so people can watch Netflix and chill and get online for school and do good peaceful things, not drone strikes.”

Satellite-to-smartphone
Meanwhile, WRC-23 sanctioned studies to progress work on satellite services variously described as direct-to-device, direct-to-cell or direct-to-mobile. In other words, enabling a standard smartphone to communicate via satellite. Mohyeldin says, “This is a crucial thing. You can see that countries are going to study it, but the potential allocation is going to be different from one region to another.”

Musk’s SpaceX successfully launched six Starlink direct-to-cell (mobile) satellites in January, having already launched about 5,000 satellites in four years. Amazon founder, Jeff Bezos, has only two LEOs in orbit for his Project Kuiper, but has a large number of launch dates booked from this year and is racing to become operational.

Meanwhile, the market is becoming ever more crowded. China is to launch two megaconstellations and Iridium Communications announced Project Stardust which it describes as “the evolution of its direct-to-device (D2D) strategy with 3GPP 5G standards-based Narrowband-Internet of Things (NB-IoT) Non-Terrestrial Network (NB-NTN) service development”.

All this competition between constellations is likely to hinder rather than help mobile operators, as we explore on page 22.
There are big trends shaping telecoms. The operators who emerge from this decade in a stronger position will be those who manage, somehow, to read and ride the political, policy and technology waves at the same time as running their businesses. This is not a sector for the faint hearted.

1 AI AND ESPECIALLY GENAI
AI is high on the agenda everywhere including, at the time of writing, the 2024 annual World Economic Forum (WEF) bash in Davos. Verizon’s CEO and Chair, Hans Vestberg, was quoted by Yahoo Finance saying, “When it comes to AI and especially generative AI [GenAI], I think at the edge of the network it’s going to be very important to have AI to take quick decisions very close to the end user – the customer or the enterprise.” He also said that AI could also help Verizon with network investment planning.

This is an important application for AI because as Colin Bannon, CTO of BT Business, pointed out, in general, the closer the edge is to the enterprise customer, the more expensive it becomes. He was speaking at Mobile Europe’s Network Now event in December. Applying intelligence has the potential to keep costs down and make full use of assets.

Operators acknowledge that they are yet to fully understand the potential of AI, but already recognise it will mean fundamentally rethinking approaches to infrastructure. In a recent interview with FutureNet World, Mallik Rao, CTIO of O2 Telefónica in Germany said, “We have a globally autonomous network which
we have been building for the last two years, but we think automation and AI should not be backwardly compatible like we usually do in telecoms because that kills innovation. So I don’t have the answer [about the future of AI] but I can tell you that is our thinking is right now.

“Whatever network automation we want to do it must be forward looking. Let’s say, for example, 5G RAN. I don’t want to do automation on 4G, not even for 5G NSA, because in 2025 we strive to go to 5G SA only.” He describes 5G NSA as “neither a future nor past technology unlike 3G, which is gone. We are re-orienting.”

So while O2 Telefónica uses some relatively basic AI and automation for predictive maintenance, automating the network operations centre (NOC) and some deploy functions, the use of GenAI and large language models (LLMs) will only be forward-looking and not backwardly compatible.

AI is also enabling operators to offer customers new services. According to a report by RCR Wireless, chip maker NVIDIA has “emerged as the undisputed leader in using its accelerated compute architecture and portfolio to bring the power of AI into a wide range of verticals” including telecoms.

Swisscom announced in December it would work with NVIDIA via its Italian subsidiary Fastweb, investing in 31 Nvidia DGX H100 systems for AI processing. It will then offer resources to customers as Infrastructure-as-a-Service (IaaS) so they can develop their own AI and GenAI applications.

As we went to press, Swisscom announced it will build GenAI-enabled, full-stack supercomputers in Switzerland, building a Trusted AI Factory for domestic customers as part of a CHF 100 million (€106.5 million) programme. It will also become a reseller for NVIDIA.

We think automation and AI should not be backwardly compatible like we usually do in telecoms because it kills innovation

Sam Altman, one of the founders and CEO of OpenAI which developed ChatGPT, sounded a sobering note among the AI euphoria at Davos. He said that the future of AI needs a breakthrough in how we produce energy, according to Reuters, because AI consumes so much power. Alex De Vries, who is studying for a PhD at the VU Amsterdam School of Business and Economics, recently suggested AI could consume as much as a country the size of the Netherlands by 2027.
In January, IDC predicted that the worldwide value of software sales for telco cloud infrastructure would more than double to $27.3 billion (€25.11 billion) by 2027, from $12.9 billion in 2022. This is due to network operators accelerating the cloud-native deployment of telco network workloads.

The software for telco infrastructure comprises virtual network functions (VNFs), cloud-native network functions (CNFs) and network functions virtualisation infrastructure (NFVI).

Ajeet Das, Research Director for Telecom Network Infrastructure at IDC, commented, “Adoption of cloud-native network functions is gaining momentum, with CNFs being deployed alongside virtual network functions across comms service providers’ cloud-based digital infrastructure”. The telcos’ aim is to gain service agility, lower cost of ownership, and elastic scaling of the network.

He warned that operators face “a range of daunting challenges”. Das said they lack in-house expertise in cloud-native orchestration and infrastructure. Operators also struggle to define and implement comprehensive security. Other fundamental issues include the operational complexity of managing on-premises, cloud and multi-cloud networks.

In its 2024 and Beyond Predictions, CCSInsight writes, “Benchmarking the transition to cloud-native networking, operators start to use the percentage of their network that is cloud-based as an indicator of success in their quarterly financial reporting. They report progress in migrating an increasing proportion of their network infrastructure and operations into the cloud as a measure of performance efficiency and strategic execution.”

Microsoft appears to be cementing its position as the hyperscaler of choice for telcos to partner, helped by its massive investment in AI and especially Generative AI (see above). In January, Vodafone Group and Microsoft agreed a far-reaching, 10-year strategic partnership. They plan to leverage AI and digital platforms to offer digital services to more than 300 million businesses, public sector organisations and consumers in Europe and Africa.

Vodafone is to invest $1.5 billion (€1.37 billion) over the next 10 years in cloud and customer-focused AI services developed in conjunction with Microsoft. For its part, Microsoft is to use Vodafone’s fixed and mobile connectivity services. Their aim is to “transform” customer experience using Microsoft’s generative AI.

They also intend to hyperscale Vodafone’s managed IoT platform and develop new digital and financial services for businesses, particularly SMEs across Europe and Africa. It will become a standalone, platform-based business in April 2024. Vodafone will modernise its data centres on Microsoft Azure, replacing “multiple physical data centres with virtual ones across Europe”.

In 2023 deployments of 5G Standalone (5GSA) slowed to 12, down from 18 the year before. This makes a total of just 50 worldwide so far. Dell’Oro points out, BT/EE, Deutsche Telekom, AT&T and Verizon are all conspicuous by their absence.

However, Dell’Oro’s Dave Bolan forecasts that 2024 will see the launch of more 5G SA cores than 2022 and there will be a number other 5GSA-related developments that should boost the case for 5GSA.

Finally, network slicing will be used more as it begins to mature. Cheaper IoT devices will be available thanks to the first commercial reduced capability new radio (RedCap NR) products hitting the market. 5G Voice over New Radio (VoNR) will improve the quality of voice communications.

5G Advanced, as specified in 3GPP’s Release 18, was due to be frozen at the end of 2023 but the freezing has been
rescheduled to March 2024. For the moment, 3GPP is sticking to its deadlines of the end of 2025 for all of Release 19 to be frozen. Release 18 supports a long list of new capabilities, including 5G with satellite backhaul, system support for AI, machine learning and extended reality (XR), and personal IoT networks.

Initial Release 19 studies include network of service robots with ambient intelligence, energy efficiency, drones, roaming for value-added services, integrated sensing and communication, and smart station services for railways.

5G Advanced will continue to evolve until close to the end of the decade. 3GPP’s 6G studies are expected to kick off towards the end of 2025 (also see page 24).

4 CHANGING TELCO OWNERSHIP AND STRUCTURE

In January, Italy’s government gave Telecom Italia (TIM) permission to go ahead with the sale of its fixed access network division to the private investment fund KKR. The national assets were sold for just €18.8 billion after years of wrangling and despite the vociferous objections of its major shareholder, Vivendi. This could rise by up to €2.2 billion if certain future performance thresholds are met.

Apparently the Italian government saw the commitments made as part of the M&A deal to be “fully adequate to guarantee the protection of the strategic interests connected with the assets involved in the transaction”. The government will maintain a so-called golden share, meaning that the infrastructure cannot be sold on without its agreement as it is seen a critical national infrastructure.

TIM is not the first telco in Europe to hive off its fixed network as a separate entity, but it is the biggest so far. O2 Czech Republic (part of the PPF Group that just trades under the O2 brand) was the first to split into two, back in 2014. It was followed by Denmark’s TDC Group (the former incumbent) in 2019, under Allison Kirkby’s leadership before she left to head up Sweden’s Telia.

There is intense speculation that Kirkby could propose the same for BT/EE now that she is the new CEO. She has been a board member of BT since 2019. It has been reported that splitting the incumbent into a NetCo and ServiceCo was mooted in board meetings some time ago, and apparently not rejected out of hand.

“TIM is not the first telco in Europe to hive off its fixed network as a separate entity but it is the biggest so far

Not everyone is as relaxed as the Italian government when it comes the ownership and operation of its national critical infrastructure. In December, the Spanish government announced it would buy a stake of around 10% in Telefónica, apparently to counter the roughly 10% stake acquired by STC a couple of months before.

The Saudi operator is controlled by Saudi Arabia’s sovereign fund and looked to become Telefónica’s biggest shareholder. This is the first injection of public capital into the Spanish operator since privatisation to comply with European Union policy back in 1997.

The ownership and control of telcos could well become a hot political topic as geopolitical tensions increase and populist nationalism rises.
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