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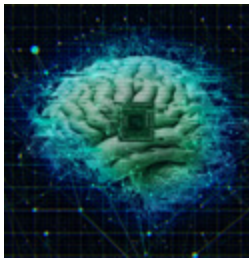

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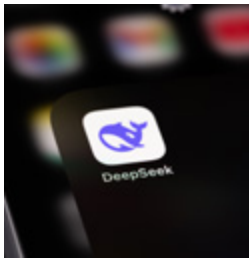

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Founder of Telecom Review Group
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Editor in Chief
Toni Eid
toni.eid@telecomreviewgroup.com

Journalists
Monika Jeleniak
monika@telecomrevieweurope.com
Clarissa Garcia
clarissa@telecomreviewasia.com

Editorial Team
Christine Ziadeh, Corrine Teng, Clarissa Garcia, Elvi Correos, Jeff Seal, Jessica Bayley, Jonathan Pradhan, Marielena Geagea, Mira Jabbour, Monika Jeleniak, Novie Nuñez, Pia Maria El Kady, Sherizze Acot

Copy Editor
Jessica Bayley

Director of Content for Media & Events
Christine Ziadeh
christine@telecomreviewgroup.com

Advertising Enquiries
Ershad – Sales Director – Group
ershad@telecomreviewgroup.com

Responsible Manager
Nada Eid

Chief Marketing Officer
Issam Eid
issam@telecomreviewgroup.com

Operations Director – Group
Anna Chumak

Graphic Designer
Vanessa Haber

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Trace Media Ltd.
Zouk Mikael, Lebanon,
Kaslik Sea Side Road,
Badawi Group Building, 4th Floor,
P.O. Box 90-2113, Jdeidet el Metn
Tel. +961 9 211741
M. +961 70 519 666

Trace Media FZ.LLC.
Dubai Media City, UAE
Building 7, 3rd Floor, Office 341
P.O. Box 502498, Dubai, UAE
Tel. +971 4 4474890
M. +971 55 639 7080

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Bożena Leśniewska, EVP/Chief Enterprise Officer, Orange Polska

AI, 5G, Fiber, and the Future: Orange Polska's Next Era

In a world where digital transformation is revolutionizing industries, Orange Polska is at the helm of innovation, championing the power of cutting-edge technologies like artificial intelligence (AI) and 5G. Rather than merely adapting to change, the company is actively shaping the future of enterprise solutions. From transforming connectivity to pioneering smart city initiatives, Orange Polska is pushing the boundaries of what's possible in the digital era.

In an exclusive interview with Telecom Review Europe, Bożena Leśniewska, EVP/ Chief Enterprise Officer at Orange Polska, delved into how the company is empowering businesses to thrive in an increasingly interconnected and digital world.

Having started your career in 2006 as Business Accounts Branch Director of TP Group at Orange Polska, how has your journey shaped your approach to leading digital transformation within businesses today?

It has indeed been a long journey. The initial step involved establishing ourselves as the leader in the telecommunications market in Poland. We achieved this by becoming the first convergent operator in the country, deploying fiber and a range of advanced network solutions for the enterprise segment. As a result, we are now the undisputed leader in mobile and connectivity services for all segments of business and institutional customers.

Subsequently, we recognized that beyond the convergence of mobile and fixed services, the true value for customers lies in the synergy created between telecommunications, IT, and integration services. This realization led us to establish a subsidiary, Integrated Solutions, in 2011, which enhanced our offerings to enterprise

> Over the past eight years, Orange Polska has transformed its position in the business-to-business (B2B) market, evolving from a telecommunications provider into a digital transformation partner

customers by providing networking and communication services, cybersecurity, and IT infrastructure solutions. Within a decade, this company became the third-largest integrator in Poland and the second-largest provider of IT and integration services to the public sector.

During this time, businesses embarked on their digital transformation journeys to thrive in the digital era and effectively meet the needs of their increasingly demanding customers. Given our strong position in the telecommunications and integration sectors, we decided to expand our customer value proposition (CVP) to include software, applications, and customer relationship management (CRM) solutions, which have become central to transforming customer experiences across all businesses.

We successfully executed two mergers and acquisitions in these areas in 2019 and 2020, bringing two midsize service integrators, Bluesoft and Craftware, into the Orange Group. This strategic move enabled us to create an end-to-end value chain for digital transformation, supporting our customers in transitioning from legacy to digital business models, encompassing connectivity, infrastructure, cybersecurity, and customized software development, all of which are enhanced by cloud, data, and AI solutions.

Over the past eight years, Orange Polska has transformed its position in the business-to-business (B2B) market, evolving from a telecommunications provider into a digital transformation partner. This shift is highlighted by a fourfold increase in ICT revenues during this period, with ICT now contributing 36% of Orange B2B's total revenue.

As EVP/Chief Enterprise Officer at Orange Polska, how do you balance the need for innovation and digital growth with the reliability and scalability businesses require in this fast-paced environment?

I totally understand how rapidly business demands are evolving today and our solutions must not only keep up with these changes but increasingly anticipate them. We must be both innovative and committed to continuous improvement in new technologies and what we offer must be reliable, secure, and easily scalable.

The ecosystem of solutions we have created allows us to meet all these needs. Now, through our subsidiaries, we invest in technologies such as AI, automation, machine learning (ML), 5G, microservice platforms, and cybersecurity, while ensuring high availability across our network and cloud services. This guarantee of operational continuity encourages enterprises and public institutions to use new digital tools.

Moreover, they increasingly expect us to guide them through this entire digital change. Thanks to our customers' trust in us, we have become one of the largest partners in the digitalization of the B2B sector in Poland.

What key opportunities will drive digital transformation for businesses in Poland in the coming years, and how is Orange Polska helping them seize these opportunities?

Companies that take a long-term market approach are unafraid to embrace new technologies. Even

> Sectors such as transport, banking, and retail have long been at the forefront of transformation in Poland, confidently adopting new technologies

though companies have recently been paying more attention to expenditure, I believe that, in the coming years, Poland will become a regional leader in modern technologies. The increasing availability of solutions like cloud, 5G, and AI, along with the development of advanced data centers, will not only optimize operations and enhance customer service but also boost organizational profitability.

Market pressure and regulations, such as the NIS2 Directive and DORA, will also act as catalysts, compelling businesses to invest in modern IT systems that strengthen digital resilience. Sectors such as transport, banking, and retail have long been at the forefront of transformation in Poland, confidently adopting new technologies. Our industrial sector is also undergoing a revolution, recognizing the tangible benefits of Internet of Things (IoT) solutions. Industrial companies are increasingly adopting automation and augmented reality (AR), leveraging private 5G networks built specifically for factories and technology parks.

The public sector is also accelerating its transformation, with EU funds playing a crucial role in supporting our local governments. Over the next two years, I anticipate significant advancements in cybersecurity, energy transition, and healthcare digitalization. Across all these areas, Orange Polska is actively involved—from single applications to hardware, sector-specific IT services, and comprehensive reference architectures.

As a leader and mentor who has grown within the company over many years, what do you believe are the key qualities that help foster a culture of growth, transformation, and collaboration within your teams?

A good leader must be, above all, a good guide, who, in addition to substantive competencies, also demonstrates soft skills. Trust, empathy, intuition, the ability to resolve conflicts, openness to dialogue, and decision-making based on consultations are the most essential features of leadership today.

Honesty, commitment, and clear communication of your vision and strategy are also important. Today's business environment is permanently changing and the ability to navigate these changes is becoming one of the key leadership competencies. Leaders must be able to tame chaos, be open to innovation, and be ready to rethink their strategies in response to new situations. All of these features build authority and trust.

How will AI and 5G integration transform enterprise solutions, and how is Orange Polska positioning itself to take advantage of these technologies in the future?

The synergy between AI and 5G technology will radically transform

> AI's ability to process and analyze vast amounts of data in real-time, combined with 5G's high-speed connectivity and low latency, will enhance operational efficiency and accelerate company decision-making

business solutions. AI's ability to process and analyze vast amounts of data in real-time, combined with 5G's high-speed connectivity and low latency, will enhance operational efficiency and accelerate company decision-making.

The pace of innovation and the adoption of new technologies will also significantly increase. The potential of these solutions is immense, so we are already investing in their development—from virtual assistants and chatbots to advanced analytics tools that help businesses understand customer behavior, optimize processes, and drive efficiency.

We already offer industrial companies a complete IoT ecosystem that automates production while AI analyzes incoming data, predicting potential failures, minimizing downtime, and reducing costs. Businesses consequently gain digital tools to model their processes, allowing for more efficient resource management. Additionally, we provide a comprehensive range of smart city solutions. Over 150 cities already use our applications, where our 5G network supports a wide range of connected devices and analyzes collected data. This improves urban life and helps city leaders save significant resources.

These are just a few examples of how AI and 5G can be leveraged. Beyond enhancing existing services, we also focus on creating new business models that integrate the benefits of both technologies. Through partnerships with global technology providers and continuous investment in research and development (R&D), we aim to stay one step ahead. We want our customers to fully harness the advantages of AI and 5G, which will drive their growth. I'm convinced this strategy will further strengthen our position as a tech operator and a trusted partner for our customers. The best is yet to come. TR

Gilles Vaqué, President and Founding Partner, PMP Strategy

Gilles Vaqué Demystifies Network Innovation, Market Expansion, and Sustainability

In an exclusive interview at the 18th edition of the Telecom Review Leaders' Summit, Gilles Vaqué, President and Founding Partner of PMP Strategy, shared his expert insights on how PMP Strategy is helping telecom companies navigate the complexities of network innovation, market expansion, and sustainability.

Gilles Vaqué discussed the key trends shaping the telecom industry, the critical transformations operators must undertake in the next three-to-five years, and the company's commitment to driving growth and operational excellence for its clients in the ever-evolving digital landscape.

How does PMP Strategy help telecom companies address key challenges like network innovation, market expansion, and sustainability?

PMP Strategy is a strategy consulting firm operating in many countries. This specificity ensures that more than 50% of our business is related to telco and tech, so we are experts in this sector. The ability to help operators get maximum value out of these new businesses is one of the key issues we are working on with several operators and telcos.

This specificity is also critical for sharing all the best practices we see in the different countries, thanks to our offices worldwide. The ability to be 'on-the-ground' to help telco companies as a true partner, enabling them to gain and catch the value of this new market and path of growth, is part of our DNA at PMP Strategy.

With technologies like 5G, AI, and IoT transforming the telecom industry, what advice does PMP Strategy have for telecom companies to remain competitive?

AI, 5G, and IoT are good growth paths for operators. As you know, in some regions, for instance, in Europe, there is no more growth for telcos and the telco sector. In others, such as North America and the GCC region, there is still huge growth potential in terms of connectivity, but the ability to capture all these new markets is key for all the companies.

We see a lot of potential in all things related to 'beyond the core' in both the B2B and B2C markets. On the B2B side, the ability to become a champion in ICT is key. In relation to this, cloud and cybersecurity is key for operators. It's an enormous market with huge, substantial worldwide players, and the ability to gain value is key for them. In the B2C market, the ability to become a payment, banking, and real marketplace player (not only a digital player) is important.

Operators have many, many, fields for growth, and that, I think, is key for them. For PMP Strategy, we have a lot of expertise in each of these sectors thanks to our many SME experts. We also know the capabilities and new business models very well.

To become a champion is not only to add a service or product to the roadmap you already have; it's about defining a strategy to build the capabilities, review the organization, and build the ecosystem. This is not the same business model as a telco model. The ability to implement operationally and reap the results of this growth in terms of P&L, is how we can help all telcos gain value in their P&L.

What key trends will shape the telecom industry in the next three-to-five years?

In the next three-to-five years, telco operators and companies will face two main issues and two main stakes. Therefore, they must be able to make two key transformations.

In terms of the core model, they must become lean, efficient, customer-oriented, and have a high sustainability target. They must revisit all their models. For instance, on the IT side, they need to transform legacy IT into smart IT that is very lean, reactive, and digital. In terms of customer care, they need to ask, 'How can I improve the NPS and use AI to improve my relationship with my customer?' as it's a key issue. On the network side, identifying how to build an intelligent network and drive and steer this network to get more value from the infrastructure and the network is key. So, there are several transformations the operator can apply to the core model in the coming year.

In parallel, it is crucial to leverage the full potential of ICT across various areas, such as cybersecurity, digital marketplaces, payment systems, and banking. This will enable active participation in multiple verticals, such as healthcare and education. There's a new path for growth, and telcos must adapt their models to create a new joint venture (JV), for instance, a new sub-company, to achieve their full value. They must also be able to manage both models.

I think the key champions in the future will be all the telcos with the ability to transform their core model and, in parallel, become champions in these new markets. TR

Stefan Spettel, CEO and Co-founder, phine.tech

phine.tech: Pioneering the Next Wave of Connectivity

As the world accelerates into the 5G era and beyond, phine.tech is leading the charge in connectivity innovation. Through its cutting-edge Virtual 5G Lab, the company is transforming how developers engage with 5G and 6G technologies.

In an exclusive interview with Telecom Review Europe, Stefan Spettel, CEO and Co-founder of phine.tech, elaborated on the challenges his company is tackling, their unique approach to bridging the gap between IT and telecommunications, and how their platform is shaping the future of network management, AI, and next-generation technologies.

phine.tech's Virtual 5G Lab is revolutionizing 5G development. What inspired the idea, and what problem did you see in the industry that needed solving?

We have observed that adopting private 5G and 5G for industrial use cases is not taking off as fast as anticipated, despite most industry leaders agreeing that 5G was built for industrial applications. When exploring the reasons behind this trend, we realized it is notoriously difficult for software engineers to develop practical 5G use cases, whether it be for robotics, manufacturing, automotive, non-terrestrial network communication, network application programming interfaces (APIs), or other areas. As software developers, we recognize that the developer community needs tools that cater to their needs and mirror their existing environments. In other words, they are easy to use, cost-effective, and offer as much automation as possible.

phine.tech operates at the intersection of IT and telecommunications. How do you foster collaboration between these traditionally separate industries?

We firmly believe that the IT and developer communities can create numerous innovative solutions and products, as seen by the many highly successful startups in this area. At the same time, we understand that 5G is a crucial driver for these use cases and products, and we need to empower developers with the tools to work their magic.

Our unique approach is to meet them where they are. We offer our Virtual 5G Lab as a Software-as-a-Service (SaaS), enabling every software developer to start their own real-life 5G network without prior knowledge of 5G. This allows them to explore 5G's capabilities and work on innovative solutions in a space with enormous growth potential—an ideal environment for ground-breaking innovations that leverage IT and telecommunications.

Your platform integrates cutting-edge 5G and 6G research. How do you see these technologies evolving, and what role will phine.tech play in shaping the future of connectivity?

We can clearly see a paradigm shift in telecommunications. In the past, a handful of influential vendors dominated 4G; today, 5G is witnessing a democratization of the market, with numerous startups and research institutes beyond major vendors experimenting, researching, and building their own products. I believe one major factor in catalyzing this shift is the establishment of robust open-source solutions that accelerate open innovation and collaboration. There is enormous potential for upcoming developments in both 5G and especially 6G.

At phine.tech, we strive to be at the center of this evolution. Whether people are researching 6G; developing 5G/6G use cases across various verticals; creating and experimenting with new network functions, xApps, or other O-RAN solutions; or exploring artificial intelligence (AI), machine learning (ML), and large language models (LLMs); our Virtual 5G Lab provides a platform that genuinely accelerates and supports their innovations.

As AI and automation take on a larger role in network management, what impact will they have on the future of telecom infrastructure?

I am convinced that there is enormous potential for AI in telecom infrastructure. It already begins with automated network orchestration using LLMs. We contributed to a workshop at the

NVIDIA GTC 2025, which leverages LLMs to autonomously provision network slices tailored to application requirements. I believe we will see many such optimizations built directly into the 5G or 6G network, with AI playing a crucial role in closing the automation loop and moving toward self-healing networks.

We should not underestimate the time and effort required to debug issues in very complex networks, and we are also exploring the use of AI in our Virtual 5G Lab to assist with that. Nevertheless, it is essential to note that much research and development (R&D) is still needed to leverage AI in 5G networks fully, and we invite people to explore these advancements in our lab.

Looking ahead, beyond 5G and even 6G, what emerging trends in telecommunications and connectivity excite you the most, and how is phine.tech preparing for them?

When we speak about beyond 6G, we are looking toward the year 2040. It will be truly exciting to imagine what the communication infrastructure on the Moon, and potentially on Mars, will look like and how they might connect with Earth. An interesting development in this area is 5G non-terrestrial networks (NTN), which leverage 5G for satellite communication. This is a use case we aim to address in our lab this year.

In general, our mission is to be at the forefront of innovation. For instance, we aspire to be among the first to launch a Virtual 6G Lab in the coming years. Our extensive cooperation with research institutes and our active contributions to open-source 5G, and, in the future, 6G networks enable us to realize this mission. TR

Meeting EAA Requirements: How Radisys Clarity Makes Voice Calls Accessible

The European Accessibility Act (EAA) mandates that voice communication services be accessible to people with disabilities and the elderly, creating urgent requirements for communication service providers (CSPs) to comply with by June, 2025. With nearly 20% of Europe's population (196 million people) suffering from hearing loss, according to the World Health Organization (WHO), solutions that enhance call clarity and comprehension are more than compliance related; they represent a significant business opportunity while improving people's lives.

Radisys's Engage Clarity—a wellness solution for people with hearing loss—helps CSPs meet these accessibility requirements by integrating 'Clarity' into their existing telecommunication voice services. With Clarity, subscribers can create a personalized hearing profile in less than 5 minutes with a simple phone call, to enhance speech intelligibility and quality during every incoming and outgoing voice call, whether it be via landline, mobile, or app-based Voice over IP (VoIP) networks. This solution enables CSPs to meet EAA compliance while better serving an expanding customer base that increasingly needs hearing assistance.

The European Accessibility Act: Setting New Standards

The EAA is a comprehensive European Union (EU) directive aimed at improving accessibility across multiple sectors, including computers, smartphones, e-commerce, banking services, and transportation. It addresses the need for standardized accessibility requirements across EU member states, benefiting both businesses (through unified markets) and individuals (through improved access to essential services).

In telecommunications specifically, the directive includes voice telephony, internet telephony, and other digital communication methods like email, chat, and SMS as part of its scope, requiring that providers ensure these services are accessible to people with disabilities by June, 2025.

Meeting EAA Requirements through Personalized Audio Enhancement

Radisys's Engage Clarity solution directly addresses EAA compliance through

personalized hearing enhancement technology integrated into existing telecommunication voice services. Following a 5-minute online hearing test, users can create a customized audio profile, mapping individual hearing patterns across different frequencies. This profile automatically optimizes call audio, enhanced based on the user's specific hearing loss characteristics, whenever the subscriber makes or receives calls.

Clinical trials demonstrate Clarity's effectiveness, with 90% of users with hearing loss reporting clearer speech comprehension and 74% experiencing less fatigue during calls. These metrics are particularly significant for EAA compliance, as they show measurable improvements in call accessibility for those with hearing loss.

While options like real-time text (RTT) and total conversation (TC) are valuable for individuals with severe or profound hearing loss (deafness) who may prefer typing or sign language and require compatible devices, Engage Clarity brings hearing loss compensation directly to voice calls, on any mobile phone. It offers a simple and cost-effective solution for those with mild, moderate, or moderately severe hearing loss and empowers them to cherish the clarity of voice communication with their family, friends, peers, doctors, and more,

Measurable Benefits Across the Ecosystem

For Subscribers:

- Personalized audio enhancement
- Multiple accessibility options (audio, text, voice commands)
- Seamless integration with existing phone service

For CSPs:

- Cost-effective path to EAA compliance through documented accessibility improvements
- New revenue through premium accessibility services reaching a large number of subscribers
- Potential to recruit new customers from competitors who don't offer these services
- Market differentiation in the growing accessibility sector

Deployment: Simple Integration, Rapid Results

Clarity integrates directly into CSP's fixed, wireless, and VoIP networks, requiring no special apps or devices on the subscriber side. The implementation involves:

- Profile creation system setup through a web-based hearing test portal
- Profile mapping to subscriber phone numbers
- Quality assurance for personalized audio enhancement
- Integration with CSP's existing voice services

The solution scales to support both large and small deployments, with demonstrated success across diverse user populations. The revenue potential from premium service offerings, increased subscriber retention, and new customer engagement, is significant.

Enhanced Accessibility with Artificial Intelligence (AI) Integration

The Radisys Engage portfolio of solutions offers additional advanced capabilities to further support accessibility and inclusion:

- **Live Transcription** enables automatic speech-to-text conversion during calls, providing visual reinforcement of conversations. This helps users benefit from multiple communication channels and meets EAA requirements for making voice services more accessible and understandable.

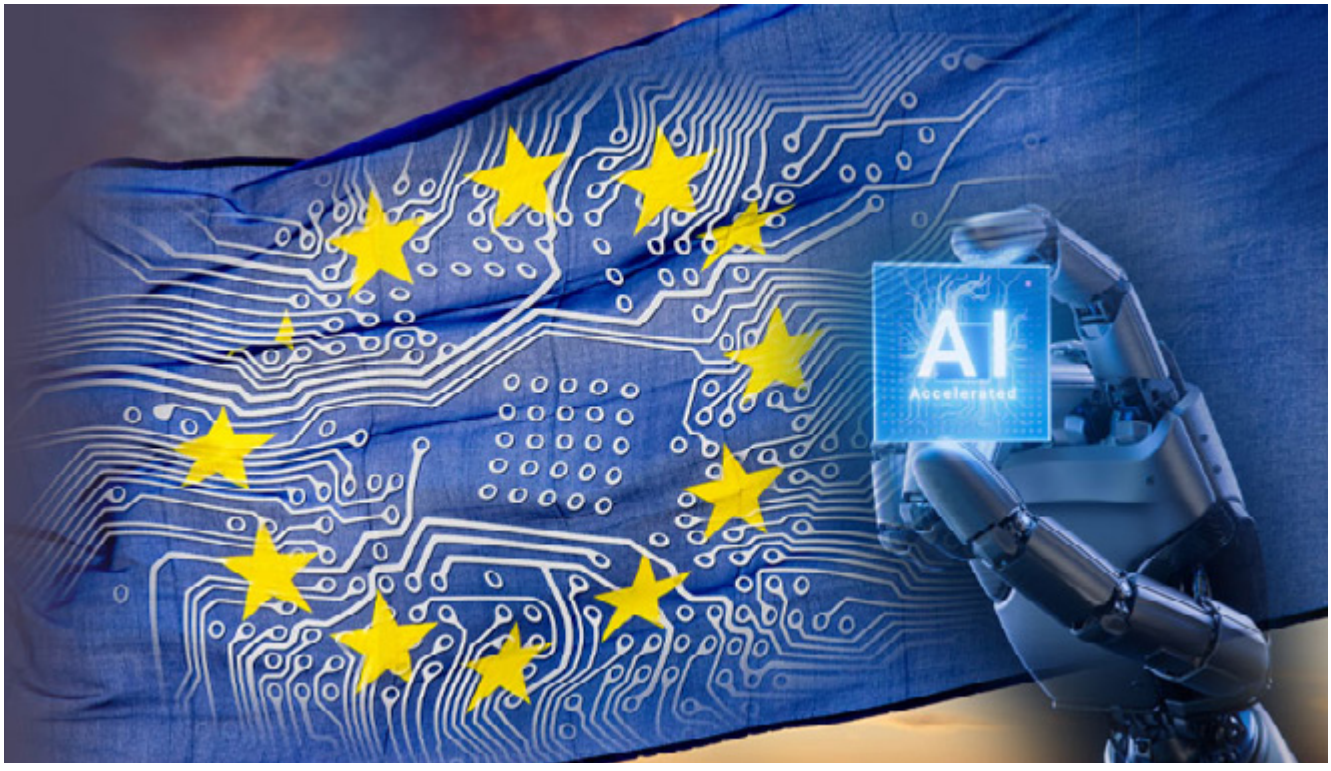
- **In-Call AI Virtual Assistant** integration allows voice commands for call management (like "mute line" or "record call"), making basic functions more accessible to users who may struggle with traditional interfaces. The assistant can detect and respond to wake words, or words that activate a voice assistant, in multiple languages, supporting the EAA's goal of inclusive communication across the EU.

Conclusion

Meeting EAA accessibility requirements isn't merely about compliance; it's about expanding telecommunications access to millions of Europeans struggling with voice calls. As the population ages and hearing difficulties become more prevalent, solutions like Radisys's Engage Clarity, Live Transcription and Translation, and In-Call AI Virtual Assistant position CSPs to address growing market needs while fulfilling regulatory obligations.

The path forward requires CSPs to act decisively before the 2025 deadline. By implementing comprehensive accessibility solutions now, providers can establish market leadership in inclusive telecommunications while building customer loyalty among an underserved population. The question isn't whether to make services more accessible but how quickly providers can adapt to serving all users effectively. TR

Meeting EAA accessibility requirements isn't merely about compliance; it's about expanding telecommunications access to millions of Europeans struggling with voice calls



Is Europe Walking, Jogging, or Sprinting in the AI Race?

As artificial intelligence (AI) reshapes industries worldwide, Europe stands at a defining crossroad—driving innovation while safeguarding its commitment to ethics and regulation. With groundbreaking AI models like DeepSeek and ChatGPT propelling global advancements, the continent faces a crucial challenge: staying competitive in the AI race while upholding transparency, accountability, and societal well-being.

In this rapidly evolving landscape, governments, businesses, and researchers must forge a future where technological progress and responsible AI development go hand-in-hand, ensuring a digital era that reflects Europe's core values.

A Tale of Two Giants: DeepSeek Versus ChatGPT

Two groundbreaking AI models are revolutionizing industries: DeepSeek, developed by the Chinese hedge fund, High-Flyer, and ChatGPT, created by OpenAI in the United States. These models are advancing natural language processing (NLP), problem-solving, and automation across sectors such as finance, healthcare, education, and the arts.

DeepSeek harnesses advanced neural networks to tackle complex challenges with unmatched speed, driving innovations in medical diagnostics, climate science, and financial forecasting. While its capabilities are revolutionary, they also raise concerns about data privacy, security, and regulatory oversight. ChatGPT, a widely adopted NLP tool, has reshaped business, academia, and creativity by generating human-like text and assisting with various tasks. While it has democratized AI access, it also raises concerns regarding misinformation, ethical content, and biases, highlighting the importance of responsible development and robust fact-checking.

Europe's latest response to these projects comes as of February, 2025, when the European Commission awarded the STEP Seal to OpenEuroLLM, a multilingual AI project, marking it the first Digital Europe Programme-funded initiative to receive the honor. The project focuses on creating the first open-source family of large language models (LLMs) to cover all official and future EU languages. The initiative brings together over 20 leading European research institutions, companies, and high-performance computing (HPC) centers.

Peter Sarlin, Co-founder of Silo AI, explained, "What's unique about this initiative is that we're bringing together many of Europe's leading AI organizations in one focused effort, rather than having many small, fragmented projects. This concentrated approach is what Europe needs to build open European AI models that eventually enable innovation at scale."

However, OpenEuroLLM may not yet match the scale of products like ChatGPT or DeepSeek. This is primarily due to Europe's cautious regulatory approach. While the U.S. and China have pursued rapid innovation, Europe emphasizes ethics, privacy, and oversight, which can slow progress. As AI models advance, especially in sensitive sectors like healthcare and governance, concerns regarding data usage are intensifying.

GDPR Versus AI

The General Data Protection Regulation (GDPR) and artificial intelligence often conflict with each other. The GDPR prioritizes data protection and privacy, while AI relies on large-scale data collection for training and improvement. This creates challenges when ensuring AI development complies with strict data regulations.

One major conflict is that the GDPR's data minimization principle requires companies to collect only essential data, while AI relies on large datasets to function effectively. AI models also struggle with the GDPR's transparency and informed consent requirements, as many AI-driven processes, especially in the deep learning niche, are complex and difficult to explain. Additionally, the GDPR grants individuals the right to understand and challenge automated decisions, while many AI systems operate as opaque "black boxes." In terms of data retention and deletion, the GDPR allows users to request data removal, however, AI models may retain insights even after the data is erased.

To comply with the GDPR, AI developers must adopt privacy-by-design approaches, ensure AI decision-making is interpretable, and explore techniques like federated learning, which allows models to learn without centralizing personal data. The EU's AI Act builds on the GDPR by introducing additional safeguards, particularly for high-risk AI applications. While the GDPR imposes limitations, it also encourages responsible AI development, pushing for innovation that respects user rights and ethical standards.

Balancing Innovation and Regulation

The European Union has set ambitious goals to become a global leader in AI while adhering to strict ethical standards. A key pillar of this strategy is the AI Act, first proposed in April, 2021, and officially coming to fruition on August 1, 2024. This landmark legislation establishes a legal framework that addresses AI transparency, accountability, and human rights. It seeks to mitigate risks such as bias, discrimination, and data misuse by implementing a tiered regulatory approach with stricter rules for high-risk applications like biometric recognition and critical infrastructure.

Complementing this effort, the AI Pact is a voluntary initiative that encourages organizations to align with the AI Act's principles ahead of its full enforcement. Over a hundred companies have already committed to the pact, pledging to uphold trustworthy and responsible AI development.

Europe's emphasis on responsible AI development is both a strength and a challenge. The EU ensures transparency and fairness by embedding ethical oversight into AI regulation, setting a global standard for responsible innovation. However, this strict framework can slow progress, especially compared to regions with more lenient regulations.

The Draghi report, published last year, warned that the EU is struggling to keep pace with the rapid technological progress in the U.S. and China. While the U.S. has

long dominated the tech landscape, Europe seems to be playing catch up with American innovation.

The Draghi report's findings are shaping the European Commission's new strategy for Europe's sustainable prosperity and competitiveness. These insights directly affect the Clean Industrial Deal, which will be presented within the first 100 days of the new European Commission mandate. The recommendations are also reflected in the European Commission's Political Guidelines and the mission letters from the President. In January, 2025, the Competitiveness Compass was introduced as a roadmap to guide Europe's economic growth and dynamism over the next five years, building on the Draghi report's analysis.

Telcos: Frontrunners in the AI Race

AI technologies, including generative AI (GenAI), drive significant transformation across the European telecom industry. According to the GSMA's January 2025 report, operators are increasingly leveraging AI to optimize network performance, enhance security, and improve customer service.

Leading European telecom operators such as Deutsche Telekom, Orange, Telefónica, and Vodafone are at the forefront of AI and GenAI adoption, with 36% of the industry integrating GenAI across multiple business areas. The applications range from network optimization to security enhancement and customer service improvements. For instance, Vodafone has entered a ten-year collaboration with Microsoft to develop AI-powered customer service solutions.

Orange integrated Augtera's AI-powered network operations platform into its operations center, reducing daily alarm alerts by 70% and enabling predictive responses to network incidents in over 100 countries. Deutsche Telekom uses its in-house AI technology to automate the analysis of 1 billion daily security data points, enabling rapid identification of cyberattacks.

A1 Austria has made significant strides in AI adoption, focusing on service automation and predictive analytics to enhance operational efficiency and customer experience. This transformation combined human expertise with AI, resulting in up to a 40% increase in sales conversions for campaigns, leading to substantial revenue growth. Telefónica Tech has introduced its GenAI Platform, enabling businesses to integrate AI-driven virtual assistants easily. This platform enhances productivity in HR, financial planning, and customer service by automating routine tasks and improving workflows. These strategic partnerships and innovative initiatives propel European telecoms to the forefront of AI-driven transformation.

The Road to the Podium

Europe's position in the AI race ultimately hinges on its ability to balance innovation with ethical responsibility. While it may not match the commercial dominance of the U.S. or China, Europe has the potential to lead in AI governance, setting global standards for responsible and transparent AI use. However, the challenge is twofold: accelerating AI development while ensuring technologies align with societal values. Encouraging collaboration between research institutions, startups, and policymakers will be crucial to narrow the investment gap and foster a competitive AI ecosystem. Strategic partnerships with industry leaders and increased public and private funding will be essential for scaling AI-driven solutions and maintaining Europe's technological sovereignty.

As AI continues to evolve, Europe finds itself at a critical juncture. By positioning itself as a leader in AI ethics and regulation, Europe has the opportunity to create a future where technology and human rights coexist. Though it may not always rapidly race to lead every breakthrough, Europe's commitment to responsible innovation and its rich ecosystem of researchers and entrepreneurs ensures its continued influence in the sustainable AI race. TR

Navigating Troubled Waters: Cable Infrastructure in the Baltic Sea

The Baltic Sea, a vital crossroad for Europe's digital infrastructure, plays an essential role in the continent's connectivity. Beneath its surface lies a complex network of undersea cables that are critical for data transmission, internet access, and global communication. These cables, which carry over 95% of the world's internet traffic, are the lifeblood of the digital economy.

However, rising geopolitical tensions pose increasing threats to this indispensable infrastructure. How can Europe safeguard these vital connections?

Europe's Hidden Digital Backbone

The digital age relies on an intricate web of undersea cables stretching across oceans to connect continents and enable global communication. Among these, the undersea cables in the Baltic Sea are particularly critical, serving as a vital artery for Europe's data traffic. They connect Scandinavian countries, the Baltic states, and Northern Europe to the broader European internet infrastructure and link Europe to Russia and, by extension, the global internet network.

According to TeleGeography's Submarine Cable Map, the Baltic Sea region is interconnected by numerous submarine cables, among them are:

- **Baltic Sea Submarine Cable:** Connecting Tallinn, Estonia; Helsinki, Finland; and Stockholm, Sweden
- **C-Lion1:** Linking Finland and Germany
- **BCS East-West Interlink:** Connecting Sventoji, Lithuania, to Katthammarsvik, Sweden
- **SwePol:** Connecting Sweden and Poland

These cables underpin critical services such as cloud computing, multinational business operations, financial market transactions, and online communication. According to industry reports from the National Oceanic and Atmospheric Administration (NOAA), over 95% of global internet traffic relies on undersea cables, highlighting their irreplaceable role in modern life. The economic implications are staggering: a disruption could impact trillions of dollars in daily financial transactions and interrupt essential services for millions of people.

To maintain continuous subsea cable service, Europe has begun deploying advanced surveillance technologies, including underwater drones, seabed sensors, and artificial intelligence systems capable of detecting anomalies. Collaboration with private-sector stakeholders is also underway to improve the resilience of this digital backbone, ensuring Europe remains connected in the face of rising challenges.

The Growing Threat

Undersea cables are no strangers to risk. Natural disasters, ship anchors, and even marine life pose everyday challenges. Yet, the security concerns surrounding these cables have intensified in recent years. The key threats are now more likely to be deliberate sabotage, cyberattacks, and geopolitical tensions targeting critical infrastructure.

The Baltic Sea, with its proximity to Russia, is particularly vulnerable. Russia's increasing military activity and its history of using non-traditional warfare tactics, such as hybrid warfare and cyberattacks, poses potential threats to undersea cables. The last few years have raised concerns over possible interference with critical infrastructure, including subsea cables that provide crucial internet connections to the region.

Moreover, the severing of fiber optic cables, such as the C-Lion1 and BCS East-West Interlink, has exposed the vulnerabilities of this infrastructure. The damage to C-Lion1 alone disrupted significant internet connectivity between Finland and Germany, underlining the potential for widespread consequences.

On December 25, 2024, the Estlink 2 power cable and four telecommunications cables between Finland and Estonia were damaged, disrupting services and prompting suspicions of sabotage. Investigations revealed that the oil tanker, Eagle S, carrying Russian oil, may have caused the damage by dragging its anchor across the seabed. Finnish authorities detained the vessel and discovered 32 serious deficiencies during the inspection, preventing it from operating until repairs are made.

In response to these events, NATO has increased its presence in the Baltic Sea to safeguard critical infrastructure. Finland's Foreign Minister announced that NATO is deploying two ships to monitor undersea assets and deter potential sabotage. Additionally, NATO bolsters surveillance efforts with underwater drones and satellite monitoring to detect anomalous activity that might threaten vital cables.

Furthermore, Finland's telecom company, Elisa, has repaired two undersea telecommunications cables damaged in the incident. However, fixing the Estlink 2 power cable will take approximately seven months. This disruption has underscored the vulnerability of the region's power and communication networks, highlighting the urgent need for stronger protective measures.

Securing the Maritime Digital Frontier

Securing the maritime digital frontier requires a multi-layered approach that combines cutting-edge technology, international cooperation, and proactive security measures.

Europe has ramped up efforts to safeguard undersea cables. This includes deploying sensors along cable routes, utilizing advanced detection systems to monitor unusual activity, and leveraging satellite surveillance to track ships that could threaten the cables. The European Union is making significant investments in monitoring and detecting disturbances to these critical infrastructures, focusing on using unmanned underwater vehicles (UUVs) to inspect and protect cables from potential sabotage.

Additionally, at the beginning of 2025, NATO launched a new mission, Baltic Sentry, to protect undersea cables in the Baltic Sea region. Secretary-General Mark Rutte announced the initiative in Helsinki, emphasizing the strategic importance of undersea cables as they facilitate USD 10 trillion in daily financial transactions.

Telcos at the Security Forefront

Telecom companies in the Baltic Sea region, such as Telia Company (Telia), Telenor Group (Telenor), Tele2, and Elisa, play a pivotal role in securing undersea cables and digital infrastructure. These companies are maintaining the security and integrity of the subsea networks connecting Europe to the rest of the world.

Telia has implemented Firewall-as-a-Service (FaaS) and a Next-Generation Firewall to curb intrusion attempts and botnets. In addition to technological defenses, Telia ensures robust subsea cable security through its ISO/IEC 27001-certified Information Security Management System (ISMS), incorporating best practices like the NIST Cybersecurity Framework and CIS Critical Security Controls. Key measures include proactive security governance, risk management, and a 'security-by-design' approach to integrate security controls into systems and infrastructure from the outset, with annual external audits ensuring continuous improvement and effective threat mitigation.

Telenor's Security Operations Centre (SOC) provides continuous protection against external threats. Alongside this, Telenor has previously expressed its support for Europe's NIS2 Directive given its potential in mandating and reshaping the security of vital infrastructure, both below and above the water, with Rolv R. Hauge, Business Continuity Manager at Telenor, emphasizing:

"Robustness and redundancy in infrastructure and systems have become necessary to protect against threats. So has the ability to withstand and recover from a serious incident."

Tele2 is enhancing the security and resilience of subsea cable infrastructure through its partnership with Equinix Fabric™ by ensuring optimized performance and secure data exchange across networks.

Elisa is strengthening the security and efficiency of its subsea cable and telecom infrastructure through its international software businesses, Elisa IndustrIQ and Elisa Polystar, which provide advanced solutions tailored to manufacturing and telecom customers, ensuring robust performance and innovation.

Looking Ahead: Strengthening Digital Defenses

As the world becomes more interconnected, securing undersea cables in the Baltic Sea is not just about protecting a few miles of fiber-optic cables; it's about safeguarding the backbone of Europe's digital economy. The stakes are high, and the need for robust security measures is growing increasingly urgent as geopolitical tensions rise.

By leveraging advanced technology, strengthening international cooperation, and maintaining a proactive approach to security, Europe is working to ensure its undersea cables remain secure and resilient in the face of evolving threats. In an era where digital infrastructure is as critical as any military asset, protecting these cables is an investment in the future of Europe's economy, security, and connectivity.

Securing the Baltic Sea's undersea cables will be an ongoing challenge as Europe continues to fortify its digital infrastructure. It requires a multifaceted approach, combining technological innovation, geopolitical awareness, and international collaboration. Only by securing these critical digital lifelines can Europe ensure its place in an increasingly interconnected and volatile world. TR

Vodafone's Divestment Domino: Lessons for Telecoms

The telecommunications industry is governed by global connectivity, innovation, and the constant need to adapt to rapidly changing technologies and consumer demands. In this landscape, long-term strategy, forward-thinking investments, and a strong market presence are critical for survival.

Vodafone has found itself at a crossroads in recent years as its approach has shifted from aggressive global expansion to a series of divestments. This growing pattern of selling off subsidiaries and exiting key markets threatens Vodafone's position in the global market and may also signal a dangerous trend for the entire telecom industry. As operators across the globe face increasing pressure to innovate and stay competitive, Vodafone's sell-off spiral represents a cautionary tale of what can go wrong when a telecom giant opts to contract rather than grow.

The Shift Towards Strategic Exits

By the early 2010s, Vodafone began initiating a series of divestments across global markets. A significant milestone came in 2014, when Vodafone sold its 45% stake in Verizon Wireless for USD 130 billion. This landmark sale provided immediate financial relief and paved the way for further divestments in various regions.

Vodafone's intention was clear: shed non-core operations, reduce debt, and become more agile in a

rapidly evolving sector. However, this approach has sparked concerns about the long-term implications for Vodafone's market position.

Vodafone's exit from emerging markets like India, Qatar, and New Zealand, alongside its retreat from certain European regions, created challenges both for the company and the broader telecom ecosystem. As the company reduced its presence in fast-growing markets, it lost valuable growth opportunities. At the same time, Vodafone concentrated its efforts on the increasingly saturated European market, where competition is fierce, and regulatory pressures continue to mount. This strategic retreat signals a departure from Vodafone's earlier global expansion ambitions, making it more reliant on Europe for revenue generation while diminishing its ability to tap into diverse international markets.

The telecom industry thrives on intense competition, which drives technological advancements and ensures competitive pricing. By scaling back its footprint in key regions, Vodafone risks weakening its position in a sector that demands constant investment in new technologies and infrastructure. As its global operations contract, Vodafone may find itself less equipped to compete with other telecom giants, further hindering its capacity to innovate and maintain leadership in the sector.

European Market Retreats

In 2016, Vodafone merged its Dutch operations with Liberty Global's Ziggo, forming VodafoneZiggo. As part of this merger, Vodafone agreed to sell its consumer fixed business, Vodafone Thuis, to T-Mobile Netherlands to meet European Commission regulatory requirements.

In 2023, Vodafone sold its Hungarian operations to 4iG Public Limited Company and Corvinus Zrt.

Vodafone's departure from Spain is yet another emblematic example of its evolving divestment strategy and market contraction. On May 31, 2024, the company completed the sale of its Spanish operations to Zegona Communications for USD 5.4 billion. Spain had long been an essential market for Vodafone, with the company investing heavily in infrastructure and expanding its customer base to compete against major local operators like Telefónica and Orange.

While the decision to divest in Spain allowed Vodafone to free up resources and focus on more profitable areas, it also raised concerns about its long-term strategy. The retreat marked the latest in a series of exits from high-pressure markets, questioning whether Vodafone prioritized short-term financial relief over the long-term benefits of maintaining a diversified and robust global footprint.

Mercurial Market Position

Vodafone's divestment strategy reached a significant milestone at the end of 2024 when the company sold Vodafone Italia to Swisscom. Swisscom acquired Vodafone Italia for EUR 8 billion (USD 8.5 billion) on a debt- and cash-free basis, marking a significant transaction in the European telecom industry.

This strategic retreat raises questions about the long-term consequences of such decisions on market innovation. Smaller telecom operators, which might fill the void left by major players like Vodafone, often struggle with investing in the infrastructure and technologies required to drive industry-wide progress as a result of limited resources. This fragmentation hampers global collaboration and slows the rollout of next-generation services, such as 5G, fiber optics, and IoT. Ultimately, this shift could diminish the dynamism of the telecom sector, reduce consumer options, and delay technological advancement, compromising the industry's ability to meet the growing demand for faster, more reliable connectivity.

Moreover, the merger with Fastweb, a subsidiary of Swisscom, created a new entity—Fastweb + Vodafone. The acquisition has sparked concerns about

market monopolization, as it further reduces the number of significant players in the Italian telecom sector. While consolidation may result in operational efficiencies, the long-term consequences can harm consumers and hinder the healthy development of the industry. The reduced competition could slow down the rollout of essential services, including 5G and fiber-optic broadband, which are critical for Italy's digital transformation. As the number of key players shrinks, the incentive to invest in new technologies and offer competitive services weakens, limiting consumer choice and technological advancements.

Conclusion

Vodafone's repeated sell-offs over the years highlight the inherent risks of a market contraction strategy. While divestments may provide immediate financial relief, they often come at a significant cost to long-term growth, market influence, and the ability to foster innovation.

As Vodafone continues to grapple with its long-term strategic vision, the broader telecom industry must take note of the ramifications of such actions. To regain its position as an industry leader, Vodafone must move away from a short-term financial approach and focus on sustainable, long-term investments in infrastructure, technology, and innovation. Only by doing so can it successfully navigate the complex and highly competitive global telecom landscape and position itself for future growth and success. TR

France's AI Strategy: A Leap Towards Innovation

France has emerged as a significant contender in the global race for artificial intelligence (AI) dominance. Through a combination of strategic investments, international partnerships, and policy innovation, the country is positioning itself as a leader in AI development and deployment. Yet, this journey towards AI excellence is fraught with challenges, from stiff competition to regulatory hurdles.

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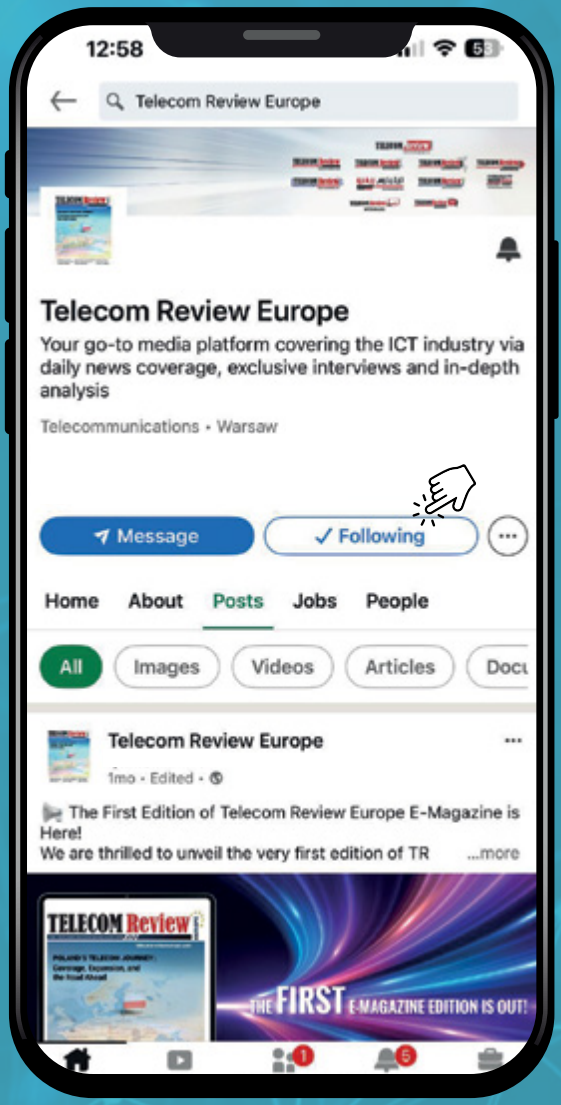
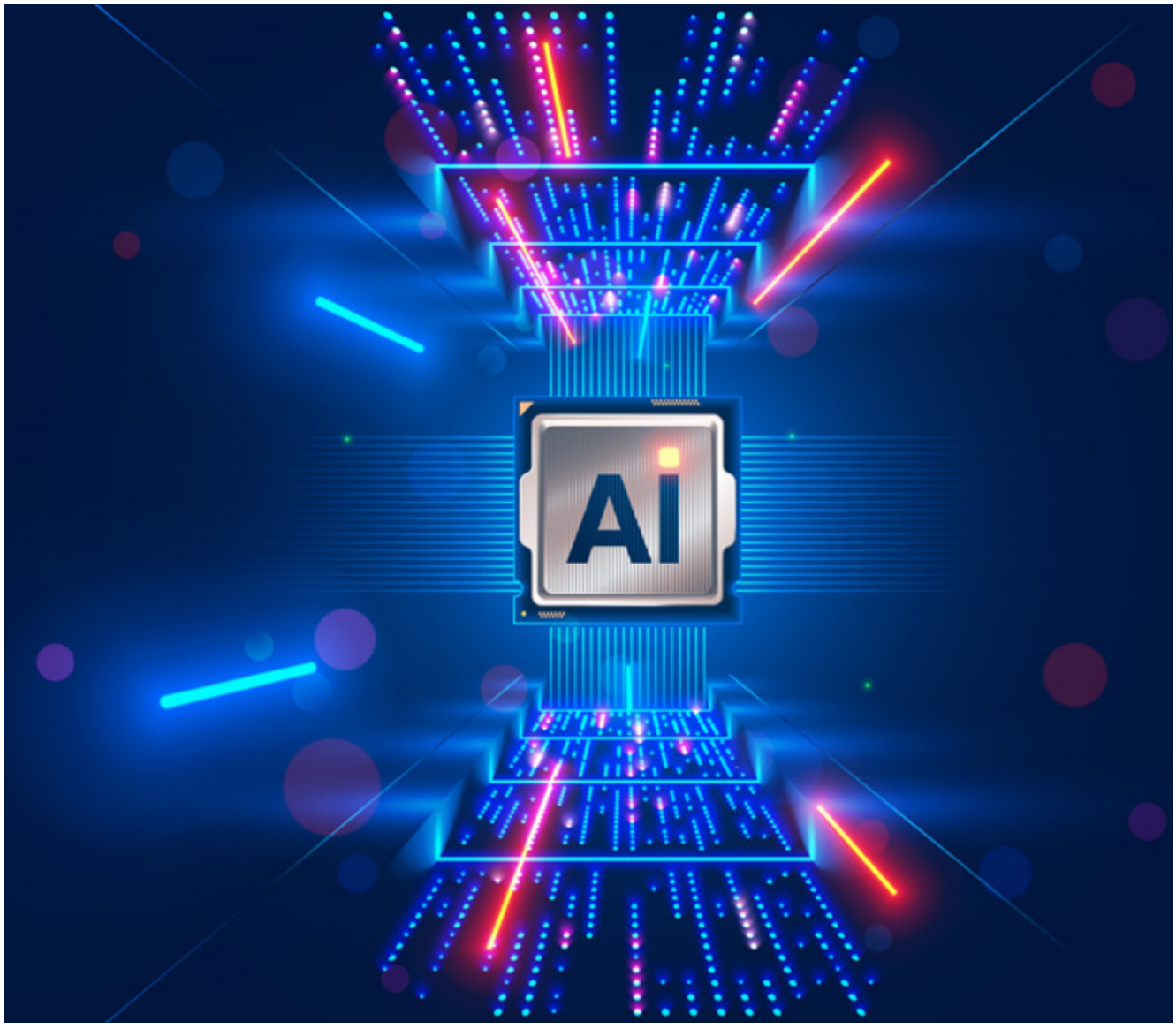




France's commitment to AI is underscored by its ambitious national strategy, which aligns with the broader objectives of the 'France 2030' plan. The government previously announced that EUR 500 million will be invested to establish AI clusters by 2030. These clusters aim to foster innovation and attract top-tier talent by integrating AI into various sectors of the economy.

The economic potential of AI in France is immense. Philippe Aghion, a professor at the College de France, INSEAD, and the London School of Economics, estimates that AI could boost the country's GDP by 0.8% annually over the next decade, adding that this potential will only be realized if the government implements an appropriate industrial policy and invests at least EUR 25 billion in the sector.

Competing with Global Heavyweights

Despite these advances, France faces formidable competition. The United States remains the global leader in AI, followed by China. Europe's lag can be attributed to both technological and structural factors.

Investors often favor the U.S., where a mature ecosystem of talent and infrastructure already exists. Meanwhile, China's massive state-led investments have allowed it to claim significant ground in the development of supercomputers, which reportedly surpass U.S. capabilities.

However, experts believe that Europe's path to AI prominence lies in strategic differentiation. French company, NukkAI, exemplifies this approach by focusing on explainable AI (systems that provide transparency in their decision-making processes).

Additionally, France's appeal to global tech giants has been instrumental. In May, 2024, Microsoft pledged EUR 4

billion in investments, including plans to build one of Europe's largest data centers in France. Such investments will bolster the country's standing as a hub for data storage and AI.

The Role of Supercomputing and Collaboration

One of the critical enablers of AI development is computing power, an area where France is making notable strides. The Jean Zay supercomputer, located in the Paris-Saclay region, is one of Europe's most powerful systems, capable of performing over 36.85 petaflops per second. Plans to inaugurate additional supercomputers, with capacities exceeding 1 exaflop, are underway, further enhancing France's computational capabilities.

However, some warn that Europe's supercomputing efforts still lag behind the U.S. and China. Christine Dugoin, Associate Professor at the Artificial Intelligence Observatory at Pantheon-Sorbonne University in Paris, believes that France needs more and larger supercomputers to strengthen its global AI competitiveness.

Inria, France's National Institute for Research in Digital Science and Technology, is pioneering French-specific AI expertise alongside the 3IA Institute, while the French National Research Agency (ANR), German Research Foundation (DFG), and Japan Science and Technology Agency (JST) have initiated a trilateral call for three-year collaborative AI research projects. Moreover, public-private laboratories are being encouraged to drive AI innovations. France is also participating in the Global Partnership on AI (GPAI), launched with Canada, to ensure AI development respects human rights and fosters innovation.

Regulatory Balance and Governance

France's AI strategy is also shaped by its regulatory framework. While the country lacks AI-specific laws, it aligns closely with the forthcoming EU AI Act, which will establish comprehensive guidelines for AI across member states. France's data protection agency, CNIL, plays a pivotal role in navigating the intersection of AI and privacy, offering guidance to ensure compliance with the GDPR.

The regulatory approach emphasizes ethical AI, focusing on transparency, accountability, and data protection. For example, initiatives rooted in pursuing "trusted AI demonstrations" aim to develop systems that are robust, explainable, and energy-efficient. This balanced approach seeks to position France as a leader in both AI innovation and governance.

The French government's latest whitepaper entitled, 'Our AI: Our Ambition for France,' has proposed the creation of a global governance structure for AI technologies. A coalition of like-minded countries will establish the World AI Organization to share scientific findings, set binding standards, and audit AI systems with democratic input from governments, civil society, and companies. The whitepaper stated that France may champion an International Fund for Public Interest AI, with an annual budget of EUR 500 million, to support free AI services, independent research, and innovations in fields like health and the environment. Additionally, France could potentially advocate for a '1% AI' solidarity mechanism, requiring international players to allocate 1% of their computing investments to developing countries.

Infrastructure and Talent Development

The French AI strategy is encouraging the development of key infrastructure through the Secure Data Access Center (enables protected data exchange for R&D through partnerships with institutions like INSEE, CNRS, and HEC Paris), government-funded 'AI Challenges,' and sectoral data hubs (designed to promote data sharing in areas like health, agriculture, and logistics). The strategy also advocates for AI-ready data commons with open and real-time datasets, enhanced data portability to ensure seamless data migration, and participation in the GAIA-X project, a Franco-German initiative for a secure, federated data system that upholds digital sovereignty and fosters innovation.

Moreover, fostering talent remains a priority. France aims to establish several universities as global leaders in AI, ensuring a steady pipeline of skilled professionals. Initiatives like the IA Booster program provide financial support to small- and medium-sized enterprises, encouraging AI adoption across industries. So far, the National AI strategy has helped to create 180 additional academic chairs and 300 additional PhDs in AI disciplines.

Future Outlook

France's AI strategy represents a bold leap towards innovation, combining significant investments with a commitment to ethical and sustainable practices.

Supporting this stance with thought-provoking insight at the 18th edition of the Telecom Review Leaders' Summit, Sergey Okhrimenko from AB Handshake emphasized that AI-driven solutions extend to combatting global telecom fraud; Per Beming from Ericsson explained that AI can revolutionize connectivity; Ali Taha Koç highlighted Turkcell's role in integrating AI to enhance regional digital transformation; the ITU's Dr. Bilel Jamoussi underscored the urgent need to align global AI strategies with the rapid pace of technological advancements; and Gordon Thomson's vision for future networks showcased the transformative potential of AI in enabling scalable, adaptive, and intelligent infrastructure.

While challenges remain, including competition from global leaders and the need for more robust infrastructure, France's focus on collaboration, regulatory balance, and strategic differentiation offers a promising roadmap for the future. By leveraging its strengths and fostering a culture of innovation, France is poised to play a pivotal role in shaping the global AI landscape. TR

Poland's Cyber Security Department: Responsibilities and Strategic Initiatives

Poland's Cyber Security Department plays a pivotal role in safeguarding the nation's cyberspace. Tasked with protecting critical information systems, fostering international cooperation, and enhancing public awareness, the department stands at the forefront of the country's defense against cyberattacks.

According to the International Trade Administration (ITA), Poland has become the most attacked country in the world with over 1,000 cyberattacks occurring each week.

In an effort to counteract these attacks, the Poland Cyber Security Department has crafted and implemented cybersecurity strategies and legislation to fortify the country's digital infrastructure. This involves issuing guidelines to secure information and communication systems, conducting risk analyses, and organizing training programs and exercises for both public and private sectors.

Key Tasks Include:

- Shaping national policies to protect the Republic of Poland's cyberspace.
- Developing and revising strategy documents to address evolving cybersecurity threats.
- Promoting public and institutional knowledge of cybersecurity.
- Initiating and supporting research and development (R&D) in cybersecurity technologies.
- Fostering international collaboration to address global cyber threats.
- Managing a registry of cybersecurity plenipotentiaries to streamline operations.
- Supervising the Ministry of Digital Affairs' information and communication security.
- Acting as a national point of contact for reporting and addressing large-scale cyber incidents in collaboration with EU member states.

The department also oversees crisis management and non-military defense preparations, ensuring the security of Poland's telecommunications infrastructure and public safety mechanisms.

Funding and Strategic Investments

Recognizing the critical importance of cybersecurity, Poland has significantly increased its financial commitment to this domain. In 2024, the Polish government announced the allocation of approximately USD 63 million annually to a dedicated Cybersecurity Fund managed by the Ministry of Digital Affairs. This fund supports initiatives designed to protect IT systems against cyber threats as well as security incident response teams and services related to national and public security.

Looking ahead, Poland plans to spend USD 2.5 billion on cybersecurity and digitization from 2025 to 2026 . This investment aligns with the country's commitment to digital development, with 5% of the GDP earmarked for digital infrastructure and innovation. These funds will be directed towards enhancing digital public services, improving cybersecurity infrastructure, and fostering AI adoption across industries.

Major Initiatives and Global Cooperation

Poland has set ambitious goals to strengthen its cybersecurity posture, leveraging both domestic and international partnerships. The recently unveiled Poland Digitization Strategy emphasizes the need for robust cybersecurity measures and highlights the following key initiatives:

- **Cloud Migration:** Shifting infrastructure to cloud platforms to enhance security and scalability.
- **High-Speed Internet Expansion:** Supporting the construction of high-speed internet networks to ensure connectivity and secure data transfer.
- **Digital Skill Development:** Training 85% of the population in basic digital skills to promote resiliency against cyber threats.

- **AI Integration:** Encouraging companies to adopt artificial intelligence (AI) tools for enhanced operational security and efficiency.

Poland aims to prioritize cybersecurity, new technologies, and cyber diplomacy on a global scale. These efforts underline the nation's commitment to fostering a secure digital ecosystem not only within its borders but also across Europe.

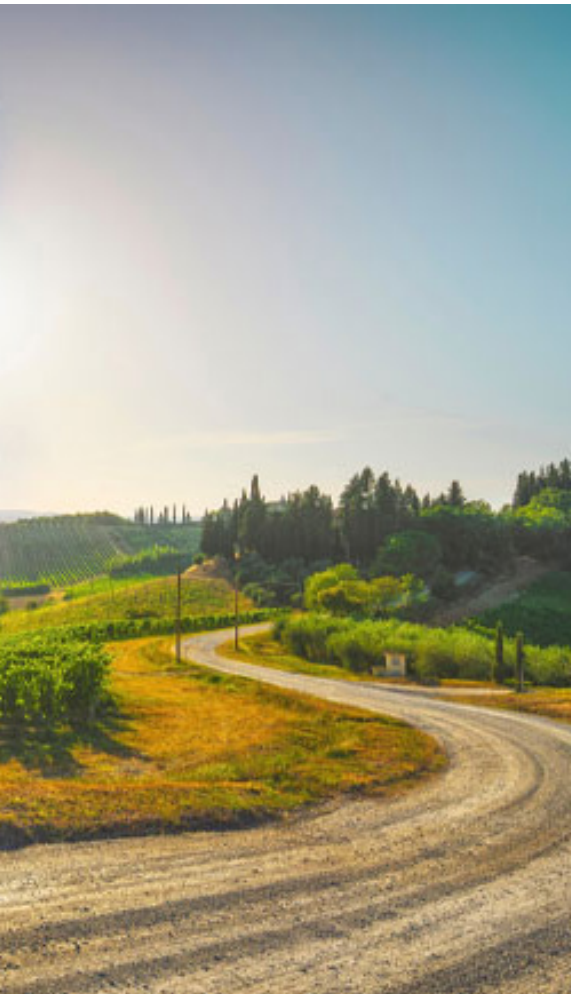
Opportunities for International Collaboration

Poland's growing focus on cybersecurity presents significant opportunities for international companies, particularly U.S.-based firms specializing in digital services and cybersecurity solutions.
With increasing investments in infrastructure and a mandate for local language support, there is ample scope for collaboration with Polish partners. Companies offering advanced threat detection systems, AI-driven cybersecurity tools, and training programs can play a vital role in strengthening Poland's cyber defenses.

Poland's Cyber Security Department exemplifies the country's proactive approach to addressing digital threats. By allocating substantial resources, fostering international cooperation, and prioritizing public education, Poland is building a resilient digital landscape. With its strategic initiatives and forward-thinking policies, the country is poised to become a leader in cybersecurity, setting an example for others to follow in the digital age. TR

Skyward Resilience: Satellite's Pivotal Role in Connecting Ukraine

Ukraine's telecommunications infrastructure has faced unprecedented challenges since 2022. As Russia's invasion continues to target critical infrastructure, satellite connectivity has emerged as an indispensable lifeline, ensuring that both military and civilian communications remain operational in the face of devastation.



In this rapidly evolving environment, satellite technology has filled gaps in traditional telecom systems and accelerated Ukraine's digital transformation.

Current Satellite Landscape

Ukraine's telecommunications connectivity is supported by multiple satellite providers apart from SpaceX's Starlink, which delivers high-speed internet nationwide, especially in conflict-affected areas.

OneWeb, in partnership with Kyivstar, plans to expand broadband satellite services in the country, while DATAGROUP leverages KA-SAT technology for two-way satellite internet access. NTvsat offers VSAT services through its German teleport, ensuring connectivity in remote locations, and GlobalTT provides GEO/LEO VSAT solutions for uninterrupted communication.

Additionally, Satcube, a Swedish company, has supplied Ukraine with portable satellite internet terminals to enhance connectivity in challenging environments. These satellite networks play a vital role in maintaining Ukraine's digital infrastructure and ensuring resilient communications.

A Lifeline in Crisis: The Role of Satellite Connectivity

From the war's outset, when fiber optics, cell towers, and power grids were destroyed, satellite connectivity kept communication lines open. Among the most critical technologies facilitating this transition was SpaceX's Starlink, which quickly became a vital resource for Ukraine's telecom infrastructure. Starlink's low Earth orbit (LEO) satellites provided essential connectivity when ground-based systems became unreliable, enabling military coordination and civilian access to the internet. Despite repeated missile strikes on infrastructure, Starlink's satellite service ensured that communication lines remained intact, allowing Ukraine to stay connected to the world.

In December, 2024, VEON, the parent company of Kyivstar, announced a partnership with Starlink to introduce direct-to-cell satellite connectivity in Ukraine. This collaboration aims to enhance the resilience of Ukraine's communication infrastructure, especially in remote areas and during emergencies. The service is expected to launch in the fourth quarter of 2025, initially offering SMS and OTT messaging, with plans to expand to voice and data services in subsequent phases.

Direct-to-cell technology enables standard 4G smartphones to connect directly to satellites equipped with advanced eNodeB modems, which function as cell towers in space. This integration allows for seamless connectivity without the need for additional hardware, firmware changes, or special applications. Users can access text, voice, and data services wherever there is a clear sky view, ensuring uninterrupted communication even when traditional networks are compromised.

Additionally, Kyivstar has been investing significantly in expanding its 4G network, increasing coverage in remote areas, and enhancing the energy resilience of its infrastructure. Oleksandr Komarov, Kyivstar CEO, emphasized that the partnership with Starlink is a major milestone in the company's goal of providing LTE coverage.

"Our collaboration with Starlink is a game-changer in our journey towards achieving our 'LTE everywhere' ambition."

Rescue via Satellite: Keeping Ukraine Connected

Satellite connectivity has been instrumental in sustaining Ukraine's civilian infrastructure during the ongoing conflict, particularly in rural areas where traditional telecom networks have been severely disrupted. The widespread deployment of satellite terminals has ensured that these regions' schools, businesses, and medical facilities remain connected, allowing vital services to continue despite the challenging circumstances.

Humanitarian organizations have also relied heavily on satellite technology to coordinate relief efforts, transport supplies, and provide medical assistance. In areas where conventional communication channels have become unreliable or unavailable due to missile strikes, satellite communications have been essential in maintaining the flow of aid. For example, organizations like the International Committee of the Red Cross (ICRC) donated three starlings to Kharkiv and Kherson to provide satellite internet access coverage to the Ukrainian Red Cross Society (URCS) branches in areas close to the frontline from January to June in 2024.

Furthermore, satellite communication has enabled non-governmental organizations (NGOs) to contact local governments and other stakeholders, ensuring that humanitarian needs are addressed promptly. For civilians in conflict zones, receiving timely information about safe locations or evacuation routes has been a matter of life or death, and satellite services have played a key role in ensuring that people stay informed.

According to DataReportal, as of January, 2024, Ukraine had approximately 29.64 million internet users, representing an internet penetration rate of 79.2%. In the same period, there were 24.3 million social media users in Ukraine, making up 64.9% of the total population. Additionally, Ukraine had 55.64 million active cellular mobile connections, which is 148.7% of the country's total population, underscoring the critical role of satellite connectivity in maintaining communication and supporting the country's digital infrastructure during the conflict.

Remote Working: Sustaining Ukraine's Economy

One of the remarkable aspects of Ukraine's resilience has been evident in its ability to rapidly transition to remote work, thanks in part to satellite connectivity. Many sectors, particularly finance, government, education, and healthcare, relied on satellite services to maintain operations in the wake of physical infrastructure destruction.

By January, 2024, the Ukrainian labor market had recovered by 93% compared to pre-war levels, with a notable 3% increase in remote work offers compared to January, 2022.

In the banking and finance sector, satellite internet played a crucial role in ensuring the continuity of online banking services and electronic payments, even as physical branches and ATMs were damaged or closed. This allowed citizens to continue accessing their funds and performing financial transactions securely through digital platforms.

Similarly, educational institutions across Ukraine leveraged satellite connectivity to deliver lessons to students, both at the primary and university levels. In 2024, Ukraine continued to adapt its educational infrastructure in response to ongoing challenges. As of January 1, approximately one million students were engaged in remote or blended learning due to inadequate shelter facilities in schools. Deputy Minister of Education and Science, Andriy Stashkiv, announced that out of 13,000 schools, 2,500 continued exclusively online.

Despite the rapid adoption of remote work, Ukraine faced significant challenges, including cyberattacks targeting satellite communications. For instance, a cyberattack on Viasat's satellite network impacted several thousand customers in Ukraine and tens of thousands across Europe. The Ukrainian tech industry has demonstrated remarkable resilience, with nearly 100% of the sector operating remotely, encompassing approximately 300,000 contractors.

A New Era of Resilient Communication

As the country rebuilds its traditional telecom networks, satellite services will provide the necessary redundancy and resilience, ensuring that critical communication systems remain operational in times of crisis. Beyond emergency connectivity, integrating satellite technology into Ukraine's digital economy will enable emerging technologies like 5G and the Internet of Things (IoT) to thrive, providing secure and high-speed connections across the country.

Ukraine has been actively enhancing its satellite capabilities through various initiatives. The Serhiy Prytula Charity Foundation acquired a synthetic aperture radar (SAR) satellite from Finnish company, ICEYE, dubbed the "People's Satellite." This crowd-funded satellite enables Ukrainian military intelligence to monitor Russian troop movements, logistics, and equipment, providing real-time data critical for strategic operations. Rheinmetall and ICEYE have also collaborated to provide Ukraine with satellite imagery to support military reconnaissance efforts.

Ukraine is accelerating its satellite development efforts to enhance its telecommunications and national security infrastructure through 2025. The State Space Agency of Ukraine (SSAU) plans to launch a constellation of seven remote Earth sensing satellites, though the full-scale war delayed some initiatives. In response, Ukraine leased the Finnish ICEYE SAR satellite for high-resolution monitoring. Meanwhile, private sector involvement is expanding, with EOS Data Analytics (EOSDA), part of the Noosphere group, deploying EOS SAT-1 for precision agriculture. Additionally, SETS (Space Electric Thruster Systems) is advancing satellite propulsion with its SPS-25 electric motor, improving satellite maneuverability. These initiatives signal a growing domestic space sector poised to support telecommunications, defense, and commercial applications.

Conclusion: A Vision for the Future

Satellite connectivity has proven to be a key pillar of Ukraine's telecom resilience in the face of extraordinary challenges. From military operations to maintaining civilian communications, satellite technology has ensured that Ukraine remains connected during times of crisis. As the war continues, Ukraine's strategic use of satellite connectivity sets the stage for a more resilient, decentralized communication system that will serve as a global strategy for building future-proof digital societies. TR

NIS2 Directive and Cyber Resilience Act: An Update on Cybersecurity Standards

The European Union (EU) has long recognized the growing need to enhance cybersecurity within its borders, particularly as digitalization accelerates across industries. As part of its ongoing efforts to safeguard the digital economy, the EU has introduced two significant frameworks: the Network and Information Security Directive II (NIS2) and the Cyber Resilience Act (CRA). These frameworks are designed to bolster cybersecurity standards and protect critical sectors from increasing cyber threats.

NIS2 Directive

The NIS2 Directive, which officially came into effect on October 17, 2024, marks a significant revision of its predecessor, the original Network and Information Security Directive adopted in 2016. The primary goal of NIS2 is to extend the scope of the EU's cybersecurity regulations to a broader range of organizations, ensuring stronger protection of essential and important services in the digital landscape.

NIS2 focuses on critical sectors that impact the EU economy, including banking, healthcare, transportation, energy, and digital services like cloud providers and data centers. The directive requires these organizations to adopt robust cybersecurity risk management measures. Some of the key provisions include the development of incident response protocols, risk analysis strategies, cybersecurity training programs, and backup management systems. Additionally, these organizations must implement security measures such as multifactor authentication (MFA) and encryption to secure sensitive data.

One of the most notable requirements is that organizations must notify national cybersecurity authorities of significant incidents within 24 hours of becoming aware of them. A significant incident is defined as any cyber event that causes operational disruptions, financial losses, or other severe consequences for the company or its clients.

Non-compliance with NIS2 can result in heavy fines. Organizations found in violation may face penalties of up to EUR 7 million or 1.4% of their global annual revenue, depending on which amount is higher. For essential entities, penalties can reach EUR 10 million or 2% of global yearly revenue, highlighting the EU's commitment to securing its digital ecosystem.

The Cyber Resilience Act

The Cyber Resilience Act (CRA), which will fully come into effect by December, 2027, introduces mandatory cybersecurity requirements for the entire lifecycle of digital products, including software and hardware with digital elements. This groundbreaking legislation places significant responsibility on manufacturers, importers, and distributors of such products, ensuring that they meet stringent security standards before these products can enter the EU market.

Under the CRA, manufacturers must implement cybersecurity protocols during the design and development phases of their digital products. Before these products are introduced to the EU marketplace, manufacturers are required to perform conformity assessments and document the security measures taken throughout the product's lifecycle. The goal is to ensure that these products are free from known exploitable vulnerabilities and come with a secure default configuration. TR

Europe's Struggle to Keep Pace with Global 5G SA Deployment

Ookla, in collaboration with Omdia, has published comprehensive research on the global reach and performance of 5G Standalone (5G SA) networks.

The report highlights Europe's lag in 5G SA deployment and monetization, showing the stark contrast between the region and global leaders like the U.S., China, and India. Despite the European Commission's commitment to positioning 5G SA at the heart of its industrial strategy to boost competitiveness, Europe's 5G SA availability remains significantly lower than its global counterparts, standing at just 2% in Q4 2024. In comparison, China leads with 80% availability, followed by India (52%) and the U.S. (24%).

Uneven Progress Across Europe

While overall adoption remains slow, Germany, the UK, and Spain have emerged as leaders, supported by targeted fiscal incentives and regulatory measures. Greece recorded the fastest median 5G SA download speed (547.52 Mbps), benefiting from the effective use of the 3.5 GHz spectrum. At the same time, Spain and Austria have made significant strides in rural coverage thanks to their deployment of the 700 MHz band.

These examples highlight how strategic policies and spectrum management can drive faster adoption. However, the lack of a unified approach across Europe has resulted in significant disparities, preventing the region from achieving the scale needed to compete globally.

Monetization Challenges and Untapped Potential

While 5G SA already delivers clear benefits, such as lower latency, higher speeds, and improved reliability, Europe is yet to capitalize on its potential fully. U.S. and Asian operators are leveraging the technology to create new revenue streams, focusing on consumer segmentation, performance-based pricing, and enterprise-specific solutions.

Spain's 2025 Telecom Overhaul

Spain's telecom sector is transforming, with market consolidation and next-generation network investments driving significant changes.

While Spain remains a leader in fiber rollout across Europe, challenges in mobile network performance continue to undermine its global telecom competitiveness.

Market Overview and Growth

Spain's Fiber-to-the-Premises (FTTP) coverage reached an impressive 95.2% in 2024, placing it among the EU's top three in terms of fiber deployment. The country also boasts one of the highest shares of broadband subscriptions, with speeds exceeding 100 Mbps, at 93.5%. Speedtest Intelligence® data shows a median fixed download speed increase from 173.32 Mbps to 210.46 Mbps between 2023 and 2024, with Digi leading the market at 321.21 Mbps.

Digi has been a standout performer, offering competitive pricing for multi-gigabit connections, including a 10 Gbps service starting at EUR 25 per month. Its early adoption of XGS-PON fiber technology and inclusion of Wi-Fi 6 customer premises equipment (CPE) have similarly driven its market share dominance.

The Spanish telecom landscape is being driven by key moves. Notably, a Macquarie-led consortium acquired Digi's fiber infrastructure and the industry witnessed the emergence of MASORANGE, a joint venture between MásMóvil and Orange. These developments are streamlining the market and improving the financial viability of fiber investments, particularly in overbuilt urban areas.

The Nordics Strengthen Europe's 5G Future

The Nordic countries have solidified their reputation as leaders in 5G deployment, showcasing advanced strategies and favorable conditions that place them ahead of much of Europe. Anchored by global telecom giants Ericsson and Nokia, the region rivals global frontrunners such as the United States, Qatar, and South Korea.

By the close of 2024, Nordic operators achieved remarkable 5G coverage milestones. Telia in Norway reported nearly 99% population coverage, DNA in Finland extended its network to all mainland municipalities, and Sweden's Tele2 and Telenor, operating through their Net4Mobility venture, surpassed 90% population coverage. Speedtest Intelligence data from Q4 2024 confirmed Denmark's leadership in 5G connectivity, having achieved 83.4% 5G availability—the highest in Europe.

Policies and Spectrum Driving 5G Success

The Nordic region's early adoption of low-band spectrum, particularly the 700 MHz band, has enabled widespread coverage. Unlike many European nations relying heavily on dynamic spectrum sharing (DSS), which compromises coverage performance, Nordic operators focused on deploying dedicated low-band spectrum. This approach has delivered superior indoor and rural 5G access without sacrificing quality.

Governments across the Nordics have also implemented forward-thinking policies to support 5G expansion. Denmark's spectrum auctions tied rural coverage obligations to licensing, ensuring underserved areas gained high-speed access. Finland mandated 99% population coverage within four years of its 700 MHz allocation, while Sweden incentivized investment in remote regions through phased targets and financial backing. These strategies, described as "carrot-and-stick" measures, have successfully bridged the digital divide.

Europe's First 5G Cross-Border Highway

Orange, O2 Telefónica, Vantage Towers, TOTEM, and the Saarland University of Applied Sciences (htw saar) have joined forces to establish Europe's first cross-border 5G highway corridor.

The project, aptly named 5G Autobahn to Autoroute (5G A2A), will span 60 kilometers and link Metz, France, with Saarbrücken, Germany. Construction is set to begin in early 2025, with completion anticipated by late 2027.

The project aims to enhance 5G connectivity for travelers crossing borders while facilitating industrial trials. The corridor will include a 55-kilometer stretch in France along the A4 and A320 motorways and a 5-kilometer segment in Germany along the A6 motorway. The infrastructure will ensure uninterrupted 5G connectivity is integrated into the Atlantic Trans-European Transport Network (TEN-T).

Orange and TOTEM will install nine new masts in France and upgrade eight existing ones to deliver dedicated 5G coverage on the 3.5 GHz frequency. Meanwhile, in Germany, O2 Telefónica and Vantage Towers will deploy five radio masts equipped with a distributed antenna system (DAS) operating at 3.6 GHz.

Driving the Future of Connectivity

Thierry Marigny, Director of the Grand Est. Region, Eastern France, Orange, noted that, "Orange is proud to lead the deployment of Europe's first next-generation 5G corridor between Metz and Saarbrücken. This pioneering project will enable connected vehicles and equipment, providing users with enhanced comfort and safety through driver assistance services."

Mallik Rao, Chief Technology & Enterprise Officer, O2 Telefónica, added, "We are building a high-speed 5G highway to deliver gigabit speeds for consumers and companies while on the move. This initiative represents a significant step toward realizing connected driving in Germany. Partnering with the automotive and logistics industries, we aim to test and implement future digital networking solutions using our high-performance 5G network."

The 5G Autobahn to Autoroute project underscores the importance of digitalization that transcends borders, paving the way for seamless connectivity and innovation across Europe. Being the first of its kind, the initiative sets a new benchmark for the future of cross-border communication and smart mobility.

Finland's Telecom Industry Poised for 1.19% CAGR Growth

The Finnish telecom industry, recognized as one of Europe's most advanced, is poised to grow at a projected compound annual growth rate (CAGR) of 1.19% from 2024 to 2029. This growth is underpinned by the country's pioneering advancements in mobile networks, substantial investments in 5G infrastructure, and its groundbreaking leadership in 6G research.

Finland's commitment to 5G technology has been transformative, achieving approximately 82% population coverage by early 2022. However, geographical expansion remains a challenge as investments focus primarily on urban areas. Recent collaborations, such as that of Telia Finland and Nokia in December, 2023, exemplify Finland's strategic approach to enhancing 5G services.

With the support of the European Union's innovation programs, Telia Finland deployed Nokia's 5G Standalone Core SaaS to improve automation, scalability, and network monetization capabilities. This partnership has enabled the development of 5G Standalone corridors along key transportation routes under the Sirius program, further strengthening the country's connectivity framework.

Meanwhile, Elisa, another major Finnish telecom operator, launched its 5G Standalone (SA) network in collaboration with Ericsson in March, 2024. This initiative introduced premium mobile connectivity services, including fixed wireless access (FWA), which promises faster speeds, reduced latency, and extended battery life for connected

devices. Such advancements underscore Finland's proactive steps toward establishing a robust digital ecosystem.

Fiber Revolution: From Copper to Gigabit Speeds

Finland's fixed broadband landscape is undergoing a transformative shift from copper-based infrastructure to fiber-optic networks. This transition is vital to meet the EU's 2030 broadband objectives and facilitate gigabit-speed internet services. Smaller municipal providers are leading this charge by employing innovative techniques like micro-trenching to lower deployment costs. Elisa's rollout of XGS-PON technology in June, 2024, marked a significant milestone, enabling data transmission speeds of up to 100 Gbps while improving energy efficiency.

Private Networks and Industry Applications

The demand for private network solutions is growing, with partnerships like that of EDZCOM and DNA playing a pivotal role. This collaboration aims to create advanced private 4G/5G networks tailored for mission-critical applications in sectors such as healthcare, ports, and manufacturing. These networks are essential for enabling autonomous operations and digitalization, positioning Finland as a leader in industrial connectivity solutions.

Pioneering 6G Research

Finland's telecom industry is at the forefront of 6G research, leveraging its legacy of innovation that began with Nokia's early advancements in mobile technology. In February, 2024, Finland launched a global initiative to foster international collaboration in 6G development. 6G Finland is an active coalition of Finnish 6G R&D organizations that aim to advance the impact of Finnish 6G expertise globally. By uniting public and private entities, Finland aims to establish itself as a global hub for advanced connectivity research, paving the way for economic growth and sustainable technological progress.

IoT and Cloud Services Driving Data Demand

With over 9.21 million cellular mobile connections as of January, 2024, Finland's telecom market boasts a 166% penetration rate, reflecting its tech-savvy population and high adoption of connected services. The rise of the Internet of Things (IoT) in industries like healthcare and automotive is fueling data consumption, supported by advancements in wireless networks. Finnish organizations are also leading adopters of cloud-based services, with increasing reliance on SaaS, PaaS, and IaaS applications set to meet evolving business needs.

Finland's telecom market is characterized by consolidation, with key players like Elisa, Telia Finland, and DNA driving innovation through strategic collaborations and infrastructure expansion. In 2023 alone, operators expanded 4G and 5G coverage across numerous regions, ensuring connectivity for urban and rural populations alike. The industry's focus on technological advancements, sustainability, and collaborative efforts positions it for sustained growth and competitiveness on the global stage.

As Finland continues to bridge the gap between urban and rural connectivity, foster 6G advancements, and champion sustainability, its telecom industry stands as a model for innovation and progress. These efforts ensure that Finland remains a pivotal player in shaping the future of global telecommunications. TR

By uniting public and private entities, Finland aims to establish itself as a global hub for advanced connectivity research, paving the way for economic growth and sustainable technological progress

Wi-Fi 6E in Europe: The Potential of the 6 GHz Band

As Europe moves forward with its implementation, the additional spectrum allocated in the lower 6 GHz band (5925-6425 MHz) is proving to be instrumental in driving innovation and meeting increasing connectivity demands. But what does this mean for telcos, and the future of wireless technology in Europe?

Wi-Fi Spectrum in Europe

Wi-Fi has undergone significant evolution, with each new generation improving upon the last. Over the past five years, Europe has significantly expanded its Wi-Fi spectrum to accommodate the growing demand for faster and more reliable wireless connectivity.

In June, 2021, the European Commission harmonized the use of the 6 GHz band across EU member states, adding 480 MHz of spectrum (5.945 GHz to 6.425 GHz) for Wi-Fi applications. This initiative nearly doubled the available spectrum, which previously comprised 538.5 MHz in the 2.4 GHz and 5 GHz bands, thereby enhancing network capacity and reducing congestion.

Member states were required to implement this allocation by December 1, 2021. For instance, in July, 2021, Germany's Bundesnetzagentur announced the availability of the additional 480 MHz in the 6 GHz band, aiming to support high-bandwidth applications like video conferencing and streaming.

In June, 2023, the European Telecommunications Standards Institute (ETSI) published the EN 303 687 standard, governing wireless broadband systems operating in the 5945–6425 MHz band. This standard facilitates the deployment of Wi-Fi 6E and future Wi-Fi 7 technologies, enhancing high-speed internet access across the region. Additionally, in July, 2023, Ofcom, the UK's communications regulator,

proposed a "hybrid sharing" model for the upper 6 GHz band (6425–7125 MHz), to enable both Wi-Fi and mobile services to share this spectrum efficiently.

In 2024, European telecom operators intensified their efforts to secure additional spectrum for mobile networks. CEOs from eleven leading European telecommunication companies, including Telefónica, collectively urged the European Commission and national administrations to allocate this band for mobile networks without undue restrictions. They emphasized that the upper 6 GHz band is crucial for addressing the growing mobile data traffic—projected to increase by up to 25% annually—and for the evolution of 5G and future 6G technologies.

Former Italian Prime Minister, Enrico Letta, echoed these sentiments, adding that Europe's strategic interest lies in safeguarding its leadership in 5G and 6G development and standardization.

These efforts align with the EU's Digital Decade targets, which strive to achieve gigabit connectivity for all European households by 2030. The allocation of 480/500 MHz in the lower 6 GHz band across the 27 EU member states and most CEPT (European Conference of Postal and Telecommunications Administrations) nations marks a major milestone. In comparison to global spectrum evolution, Europe has taken a more conservative approach, focusing initially on the lower portion of the band.

Why Wi-Fi 6E Matters

The rise of smart cities, high-density environments, and data-intensive applications has placed unprecedented strain on existing Wi-Fi networks. The additional spectrum provided by Wi-Fi 6E offers several key advantages:

- **Higher Speeds and Wider Channels:** Utilizing 160 MHz channels, Wi-Fi 6E enables faster data transmission, reducing congestion and improving overall efficiency.
- **Reduced Interference:** Operating in the 6 GHz band minimizes interference from legacy Wi-Fi devices that primarily use 2.4 GHz and 5 GHz bands.
- **Enhanced Performance in Crowded Areas:** Airports, stadiums, universities, and office buildings benefit from increased network capacity, ensuring seamless connectivity for a growing number of devices.
- **Support for Emerging Technologies:** Applications such as augmented reality (AR), virtual reality (VR), and advanced Internet of Things (IoT) solutions require the low latency and high throughput that Wi-Fi 6E delivers.

Regulatory Considerations and Challenges

While the lower 6 GHz band is already available, the expansion into the upper portion remains a topic of debate. The CEPT and European Commission are evaluating the feasibility of allowing Wi-Fi and mobile networks (such as 5G) to share the upper band, with regulatory decisions expected between 2026 and 2027.

A key consideration is ensuring that incumbent services—such as fixed satellite and radio astronomy—can coexist alongside Wi-Fi without interference. Industry leaders, including HPE Aruba Networking, are actively engaging with regulators to push for a broader spectrum allocation, arguing that access to the full 6 GHz band is essential for maintaining Europe's competitive edge in wireless technology.

Wi-Fi 6E Device Ecosystem and Adoption

The adoption of Wi-Fi 6E is gaining momentum, with a growing ecosystem of compatible devices, including smartphones, laptops, routers, and enterprise-grade access points supporting the technology. Major chipset manufacturers have embraced the technology, ensuring widespread availability and support.

The Wi-Fi Alliance launched its certification program for Wi-Fi 6E in January, 2021, and in early 2024, it introduced Wi-Fi CERTIFIED 7. With more devices now supporting 6 GHz Wi-Fi, enterprises and consumers alike can future-proof their networks, ensuring seamless connectivity for years to come.

The Future of Wi-Fi in Europe

As Wi-Fi 6E deployment continues, the focus now shifts to expanding spectrum availability and optimizing regulations to accommodate next-generation wireless technologies. The push for full 6 GHz spectrum access remains a critical goal, as European nations seek to align with global markets like the US, Canada, and South Korea, which have already allocated the entire band for unlicensed use.

For organizations, investing in Wi-Fi 6E today sets the stage for an even more powerful wireless future with Wi-Fi 7. As spectrum regulations evolve, businesses can stay ahead of the curve by upgrading their infrastructure and preparing for the next wave of connectivity advancements. TR

> Allocating the upper 6 GHz band for IMT use is crucial for facilitating the high-performance and quality development of 5G services, which, in turn, will lay the groundwork for 6G technologies

Telefónica and Vodafone Spain Launch Fiberpass Joint Venture

Telefónica España and Vodafone Spain have launched Fiberpass, the trademark of the new joint fiber optic service company (FiberCo) that both companies agreed to create last November.

The chosen brand will focus on the value of the fiber network infrastructure as the key to a better-connected future. FiberCo's motto will be 'Sharing the future together.'

In addition, both operators have announced the appointment of Pablo Ledesma as CEO of Fiberpass. Ledesma has served as Telefónica España's Director of Operations for seven years and has more than 25 years of experience in relevant positions at Telefónica.
Fiberpass will cover approximately 3.6 million building units and will enable both parties to maximize the use of the current Fiber-to-the-Home (FTTH) network, as well as identify efficiencies, both in the existing network and its future technological evolutions, allowing them to offer the best services to their customers.

The operation is pending relevant regulatory authorizations. Last Tuesday, the Council of Ministers approved the agreement authorizing Vodafone Spain's foreign investment in this joint venture (JV), while the remaining authorizations are expected to be received in the coming weeks.

Orange Romania Strikes New Green Deal with ENGIE

Orange Romania has reinforced its commitment to sustainability by entering into a new ten-year virtual power purchase agreement (VPPA) with ENGIE Romania. The telecom provider will source approximately 40 GWh of wind energy annually from an ENGIE-operated wind farm through this deal.

This marks the second renewable energy agreement between the two companies. Their previous six-year VPPA, signed in 2023, secured 30 GWh of solar energy to power Orange Romania's operations. The latest partnership further advances the operator's goal of reaching net-zero carbon emissions by 2040.

Nearing 100% Renewable Energy
Orange Romania, one of the country's largest telecom providers with over 11 million customers, has made remarkable progress in integrating renewable energy into its operations. By 2024, the company reported that 93% of its energy consumption was sourced from renewable power. This milestone puts it well ahead of many industry peers in transitioning to green energy.

The company's sustainability efforts align with Orange Group's broader environmental strategy, which includes reducing carbon emissions across all markets and investing in energy-efficient infrastructure. Orange Romania has also implemented eco-friendly initiatives, such as modernizing its network infrastructure, to minimize power consumption and has integrated energy storage solutions to enhance efficiency.

"This long-term partnership will significantly contribute to our decarbonization goals, ensuring that a substantial part of our energy needs come from renewable sources," said Julien Ducarroz, CEO of Orange Romania.

Expanding Green Energy Goals
ENGIE Romania, a key player in the country's renewable energy sector, currently operates 211 MW of renewable capacity, with 178 MW coming from three wind farms and 33 MW from five solar plants. The company aims to reach an installed renewables capacity of 1 GW in Romania by 2030, aligning with national and EU-wide decarbonization goals.

ENGIE has been rapidly expanding its power purchase agreements (PPAs) globally. In 2024 alone, the company secured 4.3 GW in PPA deals (an increase from the 2.7 GW secured in 2023) amounting to 136 TWh of electricity supply. These 85 agreements span multiple continents, covering North America, South America, Europe, Asia, and Oceania.

Nicolas Richard, CEO of ENGIE Romania, added, "More and more companies [need] to adopt this type of medium- and long-term purchase contracts, especially in the current context of volatility, in which securing medium- and long-term energy needs can help mitigate risks related to energy prices, while contributing, at the same time, to achieving sustainability objectives."

The growing demand for PPAs is primarily driven by the need for decarbonized electricity, particularly in energy-intensive sectors such as technology, data centers, and artificial intelligence (AI). With the rise of AI-driven applications requiring vast computing power, companies worldwide are seeking reliable, renewable energy sources to offset their carbon footprints.

Play Expands Network with Nearly 10 New Base Stations

Play, one of Poland's leading mobile operators, has made a significant move to enhance mobile connectivity by launching nearly 10 new mobile base stations.

This expansion is part of the operator's ongoing efforts to improve service quality and coverage across the country, particularly in areas where mobile connectivity has historically been weak.

Enhancing Connectivity in Underserved Regions

The newly activated base stations will benefit multiple regions across Poland, including Uniejów (Łódź Voivodeship), Drezdenko (Lubusz Voivodeship), Kamienna Góra (Lower Silesian Voivodeship), and Łodygowice (Silesian Voivodeship). They will improve overall network reliability and provide better mobile internet access for both residents and businesses. The expansion is crucial in addressing coverage gaps in rural and underserved areas, where Play aims to bring faster, more reliable mobile services.

This deployment is also part of a broader strategy to modernize Play's network infrastructure. The new base stations have been equipped with 5G-compatible technology to meet the growing demand for high-speed data services. This move ensures Play can meet the increasing need for faster internet speeds as users depend more on mobile connectivity for work, communication, and entertainment.

A Strategic Investment in the Future

The company has continuously ramped up its infrastructure investment over the past few years. In 2022, Play reportedly added over 10,500 base stations, marking a significant step in improving coverage in urban and rural areas. By continuing to invest in these upgrades, Play further solidifies its position in the competitive telecom market, ensuring that users across Poland can access reliable, high-quality mobile services.

The network improvements will benefit businesses in these areas, as they rely on stable mobile services for daily operations. Furthermore, as mobile usage continues to grow, especially with the increasing number of smart devices, Play's efforts to expand its network ensure that users experience fewer dropped calls, faster data speeds, and a more stable mobile connection.

This network expansion also supports Poland's broader digital transformation, as it helps integrate smart technologies and the Internet of Things (IoT) into everyday life. The availability of 5G technology will play a crucial role in facilitating the next generation of digital services, from autonomous vehicles (AVs) to smart cities.

Telia Expands 5G Coverage to Swedish Railways

Telia is committing hundreds of millions to enhance 5G coverage and capacity along Sweden's key railway routes. In collaboration with SJ and measurement company, Umlaut, Telia identifies and eliminates connectivity "white spots" along the southern and western main lines.

This initiative marks Telia's most significant railway-focused network investment, promising passengers faster, safer, and more reliable mobile connectivity.

Major Network Expansion Underway

The project's first phase will improve coverage along the Stockholm-Gothenburg and Stockholm-Malmö routes. By 2025, approximately 50 mobile base stations—both new and upgraded—will be equipped with 4G and 5G technology. Telia's ultimate goal is to achieve uninterrupted mobile connectivity across all railway routes in Sweden by 2030.

In parallel with Telia's efforts, the Swedish Transport Administration is working to boost mobile network capacity in tunnels and mountainous regions. Meanwhile, SJ has introduced radio-transparent windows on its trains, improving signal reception. As a result, passengers on key routes such as Södertälje–Katrineholm, Vingåker–Alingsås, and Boxholm–Älmhult will soon experience a more stable and high-speed connection.

5G to Boost Onboard Connectivity

Staffan Åkesson, Telia's Technical Director, highlighted, "We are now approaching the final stages of our 5G expansion and modernization of the mobile network. That's why it feels extra gratifying to be able to present a new and important community project, where we are investing heavily in better coverage for all passengers along these railway routes and better equipping everyone who is active on the track, both companies and train operators."

Monica Lingegård, SJ's CEO, echoed these sentiments, adding that, "Connectivity on board is very important for our passengers and it is therefore incredibly gratifying that Telia is making this investment. We at SJ have invested heavily in improving reception on board our trains, including by switching to radio-transparent windows, which together with Telia's investment means a major improvement for our passengers. We hope that this will encourage more people to choose the train."

With these advancements, Sweden's railway passengers can look forward to a future governed by seamless, high-speed mobile connectivity, reinforcing trains as a convenient and connected mode of travel.

Patrik Hammarén Steps Up to Lead Nokia Technologies' Next Chapter

Nokia has officially appointed Patrik Hammarén as President of Nokia Technologies and member of the Nokia Group Leadership Team. He will be based in Finland and will report to Pekka Lundmark, Nokia's President and Chief Executive Officer.

"It is a great honor to be asked to lead Nokia Technologies. Nokia has an industry-leading patent portfolio and a proven track record for monetizing its innovation. I look forward to working with our external partners and our world-class team to maximize these strengths and build upon the successful completion of our smartphone renewals last year and the momentum we have established in our licensing growth areas," Hammarén commented.

Hammarén joined Nokia in 2007 and has been acting President of Nokia Technologies since October, 2024. Prior to this role, Patrik held several senior positions in Nokia Technologies' patent licensing business including: Chief Licensing Officer, Wireless Technologies; Vice President, Head of IoT Licensing Program; and Head of Patent Licensing Greater China. During this time, he was heavily involved in the renewal of Nokia's major smartphone license agreements and the growth of Nokia's IoT licensing program.

"I am delighted to announce the appointment of Patrik as President of Nokia Technologies. During a thorough process, Patrik has demonstrated he has the strategic vision, drive, and experience to take Nokia's patent business forward into the next phase of its growth journey," said Lundmark.

Nokia Technologies is responsible for managing and monetizing Nokia's intellectual property, including the company's industry-leading patent portfolio. The business group licenses Nokia's innovation and contributions to global technology standards to other companies.

Polkomtel, Ericsson to Launch Private 5G Networks for Polish Enterprises

Polkomtel has signed an agreement with Ericsson to introduce private enterprise-grade 5G campus networks in Poland.

This marks the country's first partnership of its kind and aims to deliver dedicated Ericsson Private 5G solutions equipped with advanced security and cutting-edge data transmission technology.

Michał Sobolewski, Vice President, Management Board, Polkomtel, said, "In cooperation with Ericsson, we are introducing the first independent private campus networks—Ericsson Private 5G—in Poland. The new solution has huge business potential for Plus corporate clients. It guarantees flexibility and security, which are key when implementing advanced technologies such as the Internet of Things (IoT) or AI (artificial intelligence)."

The deal will facilitate the deployment of independent private 5G networks, supporting Industry 4.0 initiatives, the digital transformation of key economic sectors, and the adoption of Ericsson's latest global communication innovations.

Polkomtel, which operates under the Plus brand, has a long-standing collaboration with Ericsson, previously launching Poland's first 5G network. This extended partnership will now focus on pioneering new communication solutions for businesses.

Ericsson Private 5G offers high-speed data transmission, ultra-low latency, and enhanced security through a dedicated radio spectrum and network isolation. The technology enables real-time remote control of autonomous vehicles (AVs) and mobile robots, as well as precise indoor positioning, all of which are crucial for industries that require asset tracking and management. Designed for seamless integration and scalability, these networks provide enterprises with intuitive IT (information technology) solutions for flexible adaptation and growth.

Nokia Announces Justin Hotard as New President and CEO

Nokia today announced a leadership transition. Nokia's President and Chief Executive Officer, Pekka Lundmark, has informed the Board that he will step down. The Board has appointed Justin Hotard as the next President and Chief Executive Officer of Nokia. He will start in his new role on 1 April, 2025.

Hotard joins Nokia with more than 25 years' experience with global technology companies, driving innovation, technology leadership and delivering revenue growth. He currently leads the Data Center & AI Group at Intel. Prior to this role, he held several leadership roles at large technology companies, including Hewlett Packard Enterprise and NCR Corporation. He will be based at Nokia's headquarters in Espoo, Finland.

"I am honored by the opportunity to lead Nokia, a global leader in connectivity with a unique heritage in technology. Networks are the backbone that power society and businesses, and enable generational technology shifts like the one we are currently experiencing in AI. I am excited to get started and look forward to continuing Nokia's transformation journey to maximize its potential for growth and value creation," added Hotard.

After leading Nokia since 2020, Lundmark has decided to step down from executive roles and move on to the next phase of his career.

"Leading Nokia has been a privilege. When I returned to Nokia in 2020, I called it a homecoming, and it really has felt like one. I have led listed companies for more than two decades and although I do not plan to stop working, I want to move on from executive roles to work in a different capacity, such as a board professional. Justin is a great choice for Nokia, and I look forward to working with him on a smooth transition," said Nokia's President and CEO Pekka Lundmark.

Lundmark will step down on 31 March, 2025. He will continue as an advisor to the new CEO until the end of the year.

Three UK, Ericsson to Build Europe's Largest Cloud-Native Core Network

Three UK has selected Ericsson to build its next-generation cloud-native core network (set to become the largest in Europe), increasing its core capacity to 9 terabits per second (Tbps), more than three times its current capacity.

The surge in data usage on Three's network, which exceeded 2 Tbps in December, 2024, is attributed to factors such as Premier League streaming on Amazon Prime and gaming updates. This increase follows achieving speeds of 1 Tbps just over two years ago, a milestone that previously took nearly two decades to reach.

The Data Consumption Catalyst

Three UK remains the leader in mobile data consumption, boasting the highest traffic among operators, according to Enders Analysis. In 2024, customers averaged 31.5 GB of data usage per month, representing 2.4 times the national average and an 18% increase year-on-year (YoY).

The new cloud-native core network, powered by Ericsson's dual-mode 5G Core solution and supported by its cloud-native infrastructure, will be hosted on Three's distributed data center network, enhancing network proximity to customers and improving latency.

Iain Milligan, Chief Network Officer at Three, said, "The last few years have seen a tsunami of data growth, with traffic at peak times doubling in a little over two years driven by home broadband, streaming, and gaming usage on our network grow[ing] faster than ever. Our new core network with Ericsson ensures we are able to support our customers' data usage over the medium- and long-term."

Katherine Ainley, CEO of Ericsson UK & Ireland, stated, "Our longstanding partnership with Three is one built on trust, innovation, and a shared commitment to delivering exceptional mobile experiences. This project is a significant milestone in our collaboration, and we're excited to help Three build a new core network to meet the ever-growing data demands of its customers."

The cloud-native infrastructure and core network solution is currently being set up in Three's data centers and is expected to be partially operational by the end of this year, with a gradual migration of all traffic planned over the coming years.

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Join the mobile tech ecosystem from 3 to 6 March 2025 at the world's premier connectivity event, bringing together global companies, governments, and tech innovators.

Place: Fira Gran Via, Barcelona, Spain

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