# The Great Convergence:
# How AI Will Reshape Telecom's Future

**Hazem Metwally, CEO, e& Egypt**

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Hazem Metwally, CEO, e& Egypt

# The Great Convergence:
# How AI Will Reshape Telecom's Future

When some of my friends moved to the GCC in the 1990s, a phone call meant something urgent is required. Each minute, costing a few dollars, was carefully rationed. The ritual of those calls, families gathering around one single phone, passing the handset from person to person—shaped my early understanding of how technology could bridge vast distances, yet also highlighted its limitations.

Fast forward to decades later, as my nephews pursue life abroad, technology has rewritten the rules of family separation. I am now spontaneously invited to family video calls, sharing everything from morning coffee moments to evening family dinners. What was once an orchestrated monthly event has transformed into seamless, much more accessible connections—the thousands of miles between us reduced to mere pixels on a screen that fits in our pocket.

Today we stand at the threshold of an even more profound transformation. Consider how the smartphone evolved from a simple communications tool to the digital command center of modern life. Each day, billions of people navigate their lives through these devices, conducting business, connecting with family, and managing their daily activities.

We're now approaching an equally momentous transformation, one that will reshape the entire telecommunications infrastructure that powers our connected world.

*This isn't a question of if, but when, and the pace at which service providers adapt will determine their role in this new era.*

### The AI Imperative
Every conference, every boardroom meeting, every strategic discussion today inevitably turns to artificial intelligence; and to be frank, the breakthrough of language models and generative AI has earned this technology its well-deserved fame

and hype. It has been evolving in research labs and tech companies for decades. What's different now is that we've reached a historic inflection point where computational power, data availability, and algorithmic sophistication have converged to make AI not just viable, but indispensable.

For telcos, this convergence represents more than just another technology wave; it can fundamentally transform how value is created and delivered. The core mission of service providers has always been about customization of enterprise solutions for businesses, mass personalization for consumers. AI now offers unprecedented capabilities to fulfill this mission at a scale previously unimaginable.



Yet here's the critical insight: success in this new era won't come from simply adopting AI because it's trendy.

*It is easy to fall into the hyper experimentation trap by launching countless proofs-of-concept,*

*spreading resources thin across numerous initiatives, chasing every AI possibility.*

The landscape is evolving at an accelerating pace, and service providers face crucial strategic choices. Should resources flow toward operational AI that drives efficiency, toward predictive systems that enhance customer insights? Or toward products that redefine what's possible? Most companies don't have the luxury of pursuing all these paths simultaneously—and that's why strategic choice matters more than ever.

The winners in this space will be those who approach AI with precision, making deliberate choices about where and how to deploy this transformative technology. The wisest approach starts with a deep understanding of current customer pain points and opportunities, the associated resources, and the business strategy. AI decisions should be taken with a clear view of these factors. Only then can players

make deliberate choices about how AI can transform their service delivery in meaningful ways.

While the world examines profound questions about AI's impact on human creativity, computational sustainability, and ethical boundaries, telcos face a more immediate imperative. The clock is ticking on critical decisions that will shape our future. The luxury of pursuing every opportunity simultaneously exists for very few, if any, organizations.

*The true test of leadership in this era will be choosing where not to play, as much as where to place your bets.*

### The Legacy Challenge: Transforming Telco DNA

For decades, telcos have operated from a position of unique strength. Armed with spectrum licenses and infrastructure, they satisfied one of humanity's most fundamental needs: connection. As smartphones consolidated cameras, maps, entertainment systems, and communication tools into a single device, we found ourselves at the center of an expanding digital universe. Our strategies were similar and remarkably straightforward— "just do it." With guaranteed demand and regulatory frameworks, success largely depended on efficient resource allocation, vendor management, smart pricing and good execution.

But this era of relative simplicity is ending. The telco landscape demands a delicate balance between preserving the reliability that built the industry and embracing the agility needed for future innovation. It is about fundamentally reimagining what a telco can be.

The baseline for customer expectations is shifting dramatically. AI-powered experiences are, and will be, reshaping what users expect from every interaction. The same baseline will apply to the provision of connectivity in all its flavors, let alone technology solutions and services.

*That subtle call for urgency needs to be translated to products and services roadmaps, sooner rather than later.*

This challenge is particularly complex for telcos because of their dual nature. On one side, they must maintain the powerful, reliable infrastructure that powers our connected world—the "legacy DNA" that ensures five-nines reliability. On the other, they must develop the capability to innovate and deploy new services at the speed of asset light tech companies. It is about learning to sprint and maintain stability simultaneously, and I see the recent digital transformation as a good warm up.

One good approach could be the "strategic delayering;" creating distinct vehicles for innovation that can move at varying speeds and different payback horizons, all while maintaining the core operating values of reliability. Each vehicle/element would stand on its own merits, with an eye kept on metrics for value creation and synergy. A kind of dance between the art of creating tech ecosystems and the discipline of obeying realistic business fundamentals. Calling it a dance is just a poetic way of describing real world healthy friction.

At e& Egypt, we're putting this strategy into action. Rather than merely bundling new services into our core telecommunications offering, we've created focused plays that can move at the pace their respective markets demand. Our recently launched e& Fintech and Digital Lifestyle subsidiary exemplifies this approach—a strategic response to evolving customer needs, encompassing everything from digital payments through e& Cash to comprehensive payments solutions with SuperPay and entertainment solutions with Twist.

What makes our approach particularly powerful is how it allows for different innovation velocities. Our Erada for Microfinance vertical requires a deep understanding of Egypt's local communities and well considered risk management. Its deliberate pace contrasts with our digital entertainment platform, which always has to evolve rapidly to keep pace with changing consumer preferences in TV, music, and gaming.

An exciting manifestation of our strategy is our super app initiative, a digital ecosystem that brings together our loyalty platform, lifestyle services, and financial solutions in one seamless interface. It represents our bold bet on the future of digital engagement.

We've learned that success in this transformation requires more than just organizational restructuring. Each of our ventures operates with its own metrics for success, its own timeline for value creation, and its own approach to customer engagement. Yet they all benefit from the thriving foundation of our infrastructure and brand trust—a perfect example of how legacy strength can be leveraged for future innovation.

*This customer-centric approach, rather than a technology-first mindset, will distinguish the winners in telco's next chapter.*

### The Courage to Keep Learning

In my many years within the ICT sector, I've noticed a pattern. The moment a company starts saying "we know our business well" is often the moment they begin their slide towards irrelevance. It's a lesson we at e& Egypt take to heart. The truth is, in this rapidly evolving landscape, none of us can afford to stop being students.

Every morning, our teams face new challenges that didn't exist yesterday. Whether it's building cloud infrastructure, strengthening network security or adopting the new methods of AI computing, we are constantly learning, evolving and innovating. Each experience builds our expertise and makes our solutions even stronger. That's precisely how we grow.

Our commitment to "do more" is simple; it is about making technology work better for people's real needs. In Egypt's dynamic market, this means different things to different people. For some, it is the reliable mobile banking that saves hours of waiting in line. For others, it is stable internet that keeps their business running. These everyday uses of our services keep us focused on what matters: making things work, making them better, and making them matter in people's daily lives.

Looking ahead, I'm both excited and honestly a bit awed by the challenges we face. Building tomorrow's digital infrastructure while maintaining the trust of millions isn't easy. It requires us to be both bold and careful, innovative and reliable. We need to move fast while ensuring we don't break the essential services people depend on.

The future of tech telco is not just about having the latest technology or the biggest network. It's about having the courage to keep learning, to admit what we don't know, and to face each new challenge with fresh eyes. Being part of this transformation is a privilege that comes with great responsibility.

**We don't have all the answers. But we're committed to asking the right questions, to learning from our experiences, and to doing more—not just for our business, but for every person who relies on us to connect, grow, and thrive in this great convergence.** ▣

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**Sylvain Morlière, Director of Fintech Consulting, Inclusion, and Government Projects**

# Digitizing Payments to Enhance Public Service Quality

In emerging countries, the digitization of financial transactions between governments and their citizens is often a cornerstone of public service dematerialization and digital transformation efforts. It addresses issues related to cash payments and can sometimes directly facilitate access to public services. While it offers numerous benefits, its success relies heavily on key factors for effective implementation.

**C**ash Transactions: Costs, Risks, and Challenges

In emerging countries, the collection of taxes, fees, and stamp duties by government agencies and public entities, as well as the distribution of benefits such as allowances, pensions, subsidies, and scholarships to citizens, often relies on cash transactions. These cash-based transactions present several disadvantages for both public authorities and citizens:

- **Public Authorities:** Establishing and managing payment counters incurs significant costs including personnel expenses for customer service, cash handling, and accounting oversight; administrative costs for documenting payments; and operational costs for running the counters. Additionally, cash operations are prone to risks such as errors, limited traceability, difficulties in tracking inflows and outflows, and security concerns.

- **Citizens:** The challenges faced can hinder access to public services. In remote areas, citizens may need to undertake long and potentially costly journeys to make payments. Moreover, carrying large amounts of cash exposes them to security risks, while the lack of traceability of cash payments can impact customers' satisfaction and trust in public services.

**Digital Payment and Mobile Money: Accelerating the Digital Transformation of Governments**

To address these challenges effectively, governments are increasingly investing in the digitization of public services. For example:

- **Rwanda:** By 2023, Rwanda had digitized over 100 administrative procedures (such as civil registration, land registration, and fine payments) through the IremboGov platform, which integrates various digital payment tools. At that time, the platform had processed more than 25 million requests and collected over USD 250 million in

payments. Rwanda aims to digitize an additional 400 administrative procedures to further streamline public services and enhance efficiency.

- **Senegal:** The digitization of payments and enrollment in the Universal Health Coverage program has significantly expanded access to healthcare. It has also enabled beneficiaries' relatives abroad to pay contributions from overseas, thereby improving access to essential health services and increasing inclusivity.

In countries with low levels of banking penetration, particularly those with low and middle incomes, digital payment services, such as mobile money, present a valuable opportunity for effective digitization of government payments. Many governments are leveraging this technology, which has been widely adopted and used in numerous countries, to digitize administrative payments.

Governments leveraging digitized administrative payments include:

- **Ivory Coast:** Citizens can pay school fees, fines, tolls, and energy bills via mobile money, which simplifies the payment process and increases convenience.

- **Egypt:** The digital payment service Fawry allows users to settle tuition fees, driving license fees, fines, water and electricity bills, and even purchase public transport tickets. This service has greatly facilitated access to various public services, making them more accessible and efficient.

In 2022, the GSMA reported an impressive 1.2 billion mobile money accounts worldwide, with 500 million of these being actively used within a 90-day period.

### Reliability, Efficiency, and Cost-Effectiveness of Digital Payments

The digitization of public payments offers numerous operational benefits for both citizens and public entities:

- Digital payments accelerate and secure payment flows by eliminating the need for the transport, storage, and handling of cash.

- Digital payments provide better traceability through the digitization and archiving of payment information and payer identities. This enhanced traceability increases transparency in public financial management.

- By minimizing the handling of cash, digital payments lower operational costs associated with cash management.

- Digital payments offer convenience by allowing citizens to make payments remotely. This not only saves time but also reduces the need for physical trips to payment centers, benefiting both individuals and businesses.

Overall, the adoption of digital payments leads to increased operational efficiency for governments and public institutions. It reduces costs, boosts revenue, enhances the quality of public services, and modernizes the image of public administrations. For citizens, it provides an improved user experience, fostering greater trust and satisfaction with public services.

### Key Success Factors

To successfully digitize their financial transactions, governments need to address three main challenges:

1. **Providing Diverse Payment Options and Ensuring Interoperability:** Citizens should be able to use their preferred digital payment instruments. This requires governments to offer a broad spectrum of payment options. Achieving this necessitates the use of interoperability or payment aggregation platforms. These platforms facilitate the collection and disbursement of funds from, or to, multiple payment services through a single interface, eliminating the need for bilateral agreements with each payment service provider.

2. **Offering Simple and Attractive Payment Processes for Users:** To deliver tangible benefits to citizens, digital payment processes must be simple, secure, and as brief as possible. As payment systems become inherently complex due to the diversity of payment solutions and administrative information systems, it is crucial to absorb this complexity, so that it does not affect the user experience. Sofrecom's involvement in public payment digitization projects has identified several key success factors for designing an optimal user experience. These include:

- A seamless sequence of payment steps
- Easy-to-navigate interfaces with clear readability
- Clear and concise payment instructions

Utilizing user-centric approaches and iterative methodologies (such as low-fidelity mockups, prototyping, and user testing) helps develop optimal payment processes.

3. **Digital Identification (A Fundamental Enabler):** The concept of online identification and authentication is central to the digitization of payments. Governments must be able to verify, either beforehand or during the transaction, that benefits reach the correct beneficiaries and that taxpayers have indeed paid their taxes.

To achieve this, governments are relying on a national digital identity database, also known as foundational identity, which many states are implementing through programs such as WURI (West Africa Unique Identification for Regional Integration and Inclusion). In the absence of such a system, governments could consider creating ad hoc digital databases for specific public services or projects.

Regardless of the approach, it is imperative to ensure that personal data protection is upheld as it safeguards payment transaction data. Therefore, while the digitization of public payments offers numerous benefits, it is essential for public entities to standardize a structured approach that addresses the key challenges of such projects to maximize the anticipated benefits. **TR**

**Paul Norman, Chief Human Resources Officer, MTN Group (left) and Ahmad Ramadan, General Manager: Human Resources, Bayobab (right)**

# Thriving Across Africa: How Bayobab Balances Global Operations with Local Expertise

In Africa's diverse and evolving landscape, managing multinational operations requires a strategic blend of global standards and local adaptability. Bayobab, a subsidiary of MTN Group, places human resources (HR) at the core of its strategy, ensuring that operations align with both business objectives and employee empowerment across 10 countries. Achieving sustained success in such complex environments depends on people-centered leadership, cultural adaptability, and continuous innovation.

Bayobab's HR function has evolved into a proactive and strategic enabler, aligning closely with business goals, harnessing technology, and anticipating future workforce needs. As highlighted in the MTN People Report 2024, the company's HR strategy goes beyond processes—it supports digital transformation, promotes inclusion, and drives business growth across Africa.

### Empowering the Drive for Digital Connectivity across Africa

Bayobab plays a vital role in expanding Africa's digital footprint, supporting MTN Group's ambition to build a connected, inclusive future. Through 20 subsea cables, over 114,000 kilometres of open-access fiber and points of presence in 47 countries, Bayobab facilitates seamless communication across the continent and beyond. However, these technological achievements rely heavily on the dedication of the people who design, manage, and maintain this infrastructure.

The Employee Value Proposition (EVP) at Bayobab reflects the importance of meaningful work, purposeful development, and collaborative growth and positivity. Engaged employees are central to everything the company does, and the HR team ensures that each employee feels empowered to contribute meaningfully to the organization's mission. This emphasis on employee empowerment is key to sustaining performance, fostering innovation, and achieving long-term business success.

### Building Future-Ready Teams Through Continuous Learning

Aligned with MTN's 'Ambition 2025' strategy, Bayobab has prioritized upskilling and reskilling its workforce to meet the evolving demands of the digital economy. Through development programs, technical training, and mentorship opportunities, employees are prepared to thrive in a future defined by continuous change and innovation.

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Bayobab leverages data and technology to identify skills gaps and anticipate future workforce needs. This proactive approach ensures that employees are not only able to adapt to change but are also equipped to lead it. The MTN People Report 2024 reflects how these efforts align talent development with business goals, creating agile, future-ready teams capable of driving sustained growth.

Paul Norman, Chief Human Resources Officer of MTN Group, articulates the importance of this approach: "Our people are the backbone of our success, and by creating a culture where they can thrive, grow, and innovate, we ensure the sustainability of our organization."

employees feel engaged, included and empowered. This sense of belonging enhances both employee well-being and organizational success. Employees who feel valued are more motivated to collaborate, contribute, and innovate, driving both individual and company growth.

Bayobab strengthens this culture by hosting cultural celebrations and cross-location team-building activities. These initiatives promote unity, ensuring that teams remain connected with one another and with the communities they serve—regardless of geographical boundaries.

are tailored to meet the specific needs of each region. This localized approach strengthens employee engagement and promotes solutions that are relevant and impactful across various markets.

### Looking Ahead: Empowering People and Driving Progress

Ahmad Ramadan, General Manager, Human Resources at Bayobab reflects on future-proofing the workforce: "As a forward-looking organization, Bayobab is committed to building an inclusive, learning-oriented and future-ready workforce. We integrate technology with human-centered practices, balancing innovation with care and empathy for employees."

The MTN People Report 2024 highlights the importance of creating environments where employees can thrive, grow, and innovate. This focus on well-being and continuous improvement ensures that Bayobab will not only meet the challenges of today but also seize the opportunities of tomorrow.

### Growing Together: How Bayobab Nurtures its Talent

Bayobab has experienced remarkable growth over the past five years, expanding from 81 employees to approximately 400. Furthermore, employees have advanced in their careers, with notable achievements including the internal appointment of three managing directors, over 25 promotions, acting assignments, and the permanent hiring of 10 talented graduates.

Key areas of focus:
- Gender Diversity: Significantly improved gender diversity, increasing female representation from 29% in 2020 to over 43% in 2024. Efforts have emphasized empowering women in technology roles, achieving 30% representation in leadership and 36.4% at senior management level.

- Employee Engagement: Engagement levels have consistently risen, improving from 81% in 2020 to 91% in 2023.

### Championing Diversity and Inclusion Across the Continent

Diversity and inclusion are integral to Bayobab's HR strategy, reflecting both a business imperative and a social commitment. With 39 nationalities represented across its workforce, the company recognises the value of multiple perspectives in driving innovation. This inclusive culture fosters collaboration across teams and markets, ensuring that solutions align with the diverse needs of Africa's communities.

The importance of inclusion is reinforced by the MTN People Report 2024, which shows that 92% of

### A Localized Approach to Managing Global Operations

Bayobab's HR team recognizes that a 'one-size-fits-all' approach does not work. Africa's diverse markets require a localized strategy that balances global best practices with regional insights. This principle guides the company's approach to managing HR across the continent, ensuring that policies reflect the cultural, regulatory, and social dynamics of each market.

Understanding local contexts is essential to effective operations. By working closely with local teams, Bayobab ensures that HR practices

### Balancing Global Ambition with Regional Realities

Bayobab's success reflects the power of aligning global ambitions with regional realities. Through innovative HR practices, a commitment to diversity and inclusion, and a focus on employee well-being, the company continues to build a connected Africa while keeping people at the heart of its operations.

The insights from the MTN People Report 2024 validate Bayobab's efforts and inspire the company to set even higher standards. By managing multinational operations with a local touch, Bayobab fosters a culture of purpose, innovation, and growth that will sustain its leadership in Africa's digital transformation.

With people as its greatest asset, Bayobab is well-positioned to drive progress, empower communities, and create a brighter, more connected future for all. ▦

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# Managed Connectivity: Perspectives For Potential Investors

In the rapidly evolving telecom landscape, managed connectivity has emerged as a critical enabler for businesses and commercial property owners seeking to enhance their operational efficiency and customer experience. Managed connectivity encompasses a range of technologies, including WiFi, Distributed Antenna Systems (DAS), small cells, and Private Mobile Networks (PMN), all designed to provide seamless, reliable connectivity. This article delves into the significance of managed connectivity from a potential investor's perspective, exploring its main types, demand drivers, key investment themes, and future outlook.

## Types of Managed Connectivity Technologies

Managed connectivity providers typically design and install network infrastructure, as well as operate and manage the connectivity service. These technologies come in various forms, each with unique advantages and applications.

WiFi is a wireless networking technology that allows devices to connect to the internet and communicate wirelessly within a local area. It is widely used in homes, offices, and public spaces to provide internet access. In the UK and Europe, notable players in the managed WiFi market include ASK4, Glide, Wifinity, Wifirst, and Passman.

Distributed Antenna Systems (DAS) and small cells are other important technologies within managed connectivity. DAS is a network of spatially separated antenna nodes connected to a common source, enhancing wireless coverage within buildings and other structures. Small cells, on the other hand, are low-powered cellular radio access nodes that improve coverage and capacity in specific areas. Key players in this segment include Freshwave, WIG, Boldyn and Shared Access, with TowerCos such as Cellnex, TDF and Vantage Towers also developing offerings.

Private Mobile Networks (PMN) are dedicated mobile networks designed for specific organizations or industries, providing secure and reliable connectivity tailored to their needs. These networks are particularly beneficial for industries with stringent security and reliability requirements, such as healthcare, manufacturing, and logistics.

### Range of Asset Ownership and Customer Segments

Managed connectivity solutions involve various levels of asset ownership and serve diverse customer segments. Asset ownership could include data centres, upstream connectivity, local access (passive and active), and the software layer. Different ownership models can

impact the flexibility and control over the connectivity solutions, influencing the overall service quality as well as revenue models. For instance, an ISP service offered by a managed connectivity provider could involve it owning both the passive and active equipment, whereas if offered as a managed service, the provider would typically just own the software layer.

Managed connectivity serves a broad range of industries, each with unique connectivity requirements and challenges. For instance, commercial real estate developers invest in advanced connectivity solutions to enhance the value of their properties and attract high-quality tenants. In the hospitality industry, reliable high-speed internet access is a critical amenity that can significantly impact guest satisfaction. Similarly, healthcare providers rely on powerful connectivity solutions to support telemedicine, electronic health records, and other digital health initiatives.

### Demand Drivers
Several factors are driving the demand for managed connectivity solutions. One of the primary drivers is growing data demand. For instance, mobile traffic growth has exceeded 25% per annum globally, driven by smartphone proliferation, increased usage of streaming services and social media, and the introduction of unlimited data plans by major carriers. To keep up with the pace in data consumption, significant infrastructure investment is needed to ensure adequate network capacity.

Another key driver is the decline in Capex spending by Mobile Network Operators (MNOs). Mobile ARPUs have declined in many markets, leading MNOs to reduce their cost base to maintain margins through restructuring and carving out infrastructure assets. Moreover, operators invested heavily in 5G from 2017-2022 but faced high competition and flat revenue growth, leading to expected decreases in network Capex in 2023 and beyond. This has led to a shift from MNO-funded to venue-funded models.

The post-pandemic shift towards hybrid working patterns has also boosted demand for high-quality connectivity solutions. Enterprises are taking up less space, with a clear flight to quality as they choose Grade A spaces to attract employees back to offices. Commercial building developers are investing in technology to improve the quality of space, with in-building connectivity seen as a vital amenity.

Building materials also play a significant role in driving demand for managed connectivity solutions. As 5G technology promotes the use of higher frequency bands, it is more susceptible to interference from metal, insulation, and tinted glass used in buildings. With 5G subscriptions accelerating, indoor cellular coverage issues are expected to increase, creating strong demand for in-building capacity solutions such as DAS and WiFi.

### Investment Rationale for Infrastructure Funds, Private Equity Funds and Strategics
Infrastructure funds are increasingly interested in managed connectivity for several reasons. One of the primary reasons is asset ownership. Owning active and/or passive infrastructure provides long-term value and control over critical assets, ensuring stable and predictable cash flows. High capex requirements and the need to build strong relationships create barriers to entry, making it difficult for new players to compete.

Managed connectivity solutions also offer stability and predictability of cash flow through multi-year contracts (up to 5-10 years) and low churn rates. Additionally, managed connectivity providers are typically well-diversified in terms of sectors, serving a broad range of customer types, including B2C, government, hospitality, healthcare, enterprises and offices. This diversification provides insulation from economic cycles, with contracted revenue often protected against inflation. Recent deals, such as the acquisition of ASK4 by GI Partners, highlight the growing interest and investment in this sector by infrastructure funds.

Private equity funds are also increasingly drawn to managed connectivity investments. The managed services component of connectivity solutions offers recurring revenue as well as growth potential in adjacent segments and markets. For example, the acquisition of Wifirst by CAPZA demonstrates the attractiveness of managed connectivity solutions to private equity investors. These funds see opportunities for growth through strategic acquisitions and expansion into new markets, leveraging the recurring revenue streams and scalability of managed connectivity solutions.

Strategic investors are interested in managed connectivity assets for consolidation and synergy opportunities. The managed connectivity market could potentially be ripe for consolidation, with larger players acquiring smaller companies to expand their service offerings and market reach. For instance, opportunities exist for DAS providers to accelerate their positioning in the Managed WiFi segment (and vice versa) through acquisition, driven by synergies in account management, infrastructure, and technical capabilities. Bundling services as a unified communications offering can also reduce churn and enhance customer loyalty.

### Potential Investment Risks
While managed connectivity offers numerous benefits, it also presents certain risks. Segment concentration can lead to seasonality and utilisation risks for some players. High competition in certain segments of the managed connectivity market can impact margins and growth potential. To mitigate these risks, conducting thorough commercial due diligence is essential to identify and address potential challenges.

As the demand for reliable and scalable connectivity solutions continues to grow, managed connectivity will play an increasingly vital role in driving digital transformation and unlocking new growth potential in the telecoms industry. By understanding the market drivers and strategic importance of managed connectivity, investors can effectively navigate the evolving landscape and capitalize on emerging opportunities. **TR**

*By Reef Read, Partner, Telecom, Media & Technology, PMP Strategy UK and Ming Chan, Associate Partner, Telecom, Media & Technology, PMP Strategy UK*

# Bridging Africa's Digital Divide with Human-Machine Interfaces

Africa's digital transformation journey has witnessed remarkable progress, yet the digital divide remains a significant hurdle. Millions across the continent still lack access to essential technologies, preventing full participation in the digital economy. In response, Human-Machine Interfaces (HMIs) are emerging as innovative solutions, offering hope for greater accessibility and inclusion.

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**W**hat Are Human-Machine Interfaces? HMIs are platforms where humans interact with technology. Ranging from touchscreens and graphical interfaces to sophisticated voice recognition and augmented reality (AR) applications, these interfaces are transforming how people engage with the digital world. By simplifying interactions and making technology more intuitive, HMIs are proving instrumental in bridging digital gaps, especially in regions where literacy or language barriers persist.

### Innovative Solutions in Practice

The latest HMI technologies are revolutionizing how various services are accessed and utilized. For example, voice-activated systems are proving to be game changers in financial inclusion and healthcare. These interfaces can be tailored to understand and process local African languages and dialects, a critical step forward given the continent's linguistic diversity. Companies are leveraging advancements in natural language processing (NLP) to develop digital assistants that cater to rural and low-literacy populations, enabling more people to access essential information and services without the need for traditional literacy skills.

In mobile banking, HMI-driven platforms allow users to navigate financial services using voice commands, making banking accessible to those who may not be familiar with text-based applications. This innovation can further expand financial inclusion, building on the success of trailblazers like M-PESA, which brought banking services to millions of previously unbanked Africans.

In healthcare, HMI advancements are enabling more intuitive diagnostic tools and telemedicine solutions. For instance, AR-assisted interfaces can guide healthcare workers in rural clinics, helping them provide accurate medical care even without a specialist present. Similarly, voice-based health apps can provide preventive care information and answer health-related queries in local languages, empowering communities with life-saving knowledge.

### Improving Accessibility for Diverse User Groups

The potential of HMIs extends beyond just simplifying technology; they can make digital platforms accessible to a wide range of users, including those with disabilities. For individuals with limited mobility, voice-activated interfaces enable hands-free navigation of digital content. Similarly, for the visually impaired, audio feedback and tactile interfaces foster greater independence in interacting with smartphones or computers.

In agriculture, a sector employing much of Africa's population, HMIs can provide accessible solutions for farmers. Imagine AR glasses offering real-time crop management advice or a voice assistant delivering up-to-date market prices in a farmer's native language. By catering to diverse user groups, these technologies not only empower individuals but also boost economic opportunities across the continent.

Education is another area benefiting from HMI innovation. Interactive educational tools that use gamification and visual storytelling can engage young learners in under-resourced schools, where traditional teaching materials are scarce. These interfaces can simplify complex subjects into understandable, engaging content, closing gaps in education and boosting digital literacy.

### Challenges and Considerations

Despite the clear benefits, implementing HMIs in Africa presents challenges. One major concern is the infrastructure deficit; many HMI solutions require stable internet connectivity, which is still unavailable in vast parts of the continent. Without reliable infrastructure, even the most advanced interfaces have limited effectiveness. Addressing this issue demands a coordinated approach, involving investments from both the public and private sectors to improve connectivity.

Data privacy and security represent another critical concern. HMIs often rely on personal data to function effectively, from voice recognition to personalized user experiences. Ensuring that this data remains secure and is used ethically is essential, especially in regions where digital literacy is low, increasing the risks of data misuse.

Furthermore, cultural relevance is crucial. Designing HMIs that respect and integrate local customs, languages, and societal norms is no small feat. Developers must engage with local communities to ensure these interfaces feel familiar and intuitive, avoiding a top-down approach that could alienate the very populations they aim to serve.

Finally, developing HMIs tailored to Africa's needs requires significant resources and research. Training AI models in numerous African languages, many of which lack extensive written datasets, presents a unique challenge. Collaboration between governments, tech companies, and academic institutions is essential to advance this field.

### A Path Forward

The potential of Human-Machine Interfaces to transform Africa's digital landscape is immense. With thoughtful implementation and a focus on inclusivity, HMIs can break down long-standing barriers, making digital services accessible to all. As governments, businesses, and innovators work together to tackle the challenges of infrastructure and cultural adaptation, HMIs could be a driving force in creating a more equitable digital future.

Ultimately, bridging the digital divide through HMIs is not just about technological advancement but also about improving quality of life and empowering communities. By prioritizing accessibility, Africa can harness the full potential of its digital revolution, fostering growth and inclusion for generations to come. **TR**

# ITU Reports 5.5 Billion Global Internet Users as Digital Divide Persists



An estimated 5.5 billion people are online in 2024, marking an increase of 227 million individuals based on revised estimates for 2023, according to new figures from the International Telecommunication Union (ITU).

The estimates featured in ITU's Facts and Figures 2024 show that connectivity continues to increase worldwide but reveal the complexities of reaching communities in low-income countries.

While an estimated 68% of the global population is now online and all indicators tracked in the report show improvement, stubborn digital divides persist and about one-third of the world's population remains offline.

"Facts and Figures 2024 is a tale of two digital realities between high-income and low-income countries," said ITU Secretary-General Doreen Bogdan-Martin. "Stark gaps in critical connectivity indicators are cutting off the most vulnerable people from online access to information, education and employment opportunities. This report is a reminder that true progress in our interconnected world isn't just about how fast we move forward, but about making sure everyone moves forward together."

**Level of Development and Connectivity Closely Linked**
Facts and Figures 2024 shows that internet use remains tightly linked to the level of development.

In high-income countries, 93% of the population is estimated to be using the internet in 2024. This contrasts with low-income countries where only 27% of the population is estimated to be online.

Connectivity challenges also remain in the least developed countries (LDCs) where only 35% of the population is estimated online and landlocked developing countries (LLDCs) with only 39% online.

In total, an estimated 2.6 billion people are offline in 2024, accounting for 32% of the world's population. This is down from the newly revised estimate of 2.8 billion for 2023, which represents 35% of the population.

"The world is inching towards universal access when it should be sprinting," said Cosmas Luckyson Zavazava, Director of ITU's Telecommunication Development Bureau. "While we continue to make progress on connectivity, our advances mask significant gaps in the world's most vulnerable communities, where digital exclusion makes life even more challenging. We must intensify our efforts to remove the barriers that keep people offline, close the usage gap, and renew our commitment to achieving universal and meaningful connectivity, so that everyone can access the internet."

# South Africa Plans Satellite Initiative to Close the Digital Divide



South Africa's National Communications Satellite Strategy aims to bridge the digital divide, drive economic growth, and ensure equitable access to digital services through cutting-edge satellite infrastructure.

Pending Cabinet approval, the strategy—developed collaboratively by the Departments of Communications, Digital Technologies (DCDT), Science, Technology, and Innovation (DSTI), along with SENTECH and SANSA—promises transformative impacts, particularly in rural and underserved areas.

The strategy outlines three project layers: upstream satellite design and specifications, midstream satellite launch and operation, and downstream IT infrastructure for e-government services. Its Socio-Economic Impact Assessment (SEIAS) was approved by the Presidency in November 2023, enabling further consultations with Cabinet Clusters.

Co-Chairpersons Ms. Tsakani Shiviti and Ms. Khusela Sangoni Diko emphasized the project's potential to boost the digital economy, despite fiscal constraints, and urged for a detailed business plan and joint oversight from related committees.

telecom**egypt**®

# Connecting
# The Seas

**Telecom Egypt turns tomorrow's vision into a reality.**

# Kenya's Mobile Money Hits Sh6.5 Trillion in 2024



Mobile money transactions in Kenya reached Sh6.5 trillion between January and September 2024, a 13.2% increase from Sh5.8 trillion during the same period in 2023.

This growth was partly fueled by Airtel Kenya's policy change in February, which removed restrictive withdrawal codes. The new policy allows users to retain funds in their e-wallets without needing to withdraw within a week, aligning with the Central Bank of Kenya's (CBK) National Payments Strategy 2022-2025 to enhance mobile money interoperability.

**Key Trends in Mobile Money**
According to the Kenya National Bureau of Statistics (KNBS), this marked a sharp rebound from a 2.7% decline in the same period last year. February saw the highest transaction value at Sh790.8 billion, while September recorded the lowest at Sh670.52 billion.

The number of mobile money accounts rose by 3.4%, adding 2.6 million new subscriptions to hit 79.4 million. Active mobile money agents also increased by 14.4%, reaching 367,551.

Airtel's improved interoperability boosted the adoption of its platform, although M-Pesa retained a commanding 93.4% market share as of June 2024, with Airtel Money holding 6.6%.

Mobile money continues to be a pillar of Kenya's financial ecosystem, supported by regulatory initiatives to lower transaction costs and improve platform integration.

# Ghana to Open ICT Lab in Bouya Community For Digital Inclusion



Ghana's Minister of Communications and Digitalization has unveiled plans to establish an Information and Communication Technology (ICT) lab in the Bouya Community. This initiative aims to bridge the digital divide, boost ICT literacy, and empower residents with essential digital skills.

During a recent visit to inaugurate rural telephony sites in the area, the Minister highlighted the critical role of digital inclusion in fostering socio-economic growth.

**The ICT lab will offer:**
- Digital Skills Training: Enhancing employability and fostering entrepreneurship.
- E-Learning Platforms: Expanding access to quality education.
- Online Resources: Connecting residents to global information and services.

This announcement has been warmly received by the Bouya Community, which has long anticipated such a resource. The lab will complement the newly launched rural telephony sites, further improving connectivity and digital capabilities in the region.

The initiative aligns with Ghana's national strategy to harness technology for development. By investing in ICT infrastructure and digital literacy, the country is positioning itself as a hub for innovation and economic growth.

# Advancing Rural Connectivity in Africa with Renewable Energy



In Sub-Saharan Africa, where over 20% of grid electricity comes from renewable sources, the telecom sector is significantly lagging in green energy adoption. Mobile operators in the region rely on renewables for only about 10% of their power needs, roughly half the grid's share. Additionally, network energy efficiency remains low, with telecom operators consuming approximately 0.24 kWh per GB of data—well above the global average of 0.15 kWh.

This discrepancy raises crucial questions about the underlying challenges and what can be done to address them.

**Barriers to Renewable Energy Adoption**
Several factors contribute to the slow adoption of renewable energy in the African telecom sector:

**High Costs:** The high initial investment required for renewable infrastructure, such as solar-powered base stations, remains a major hurdle.

**Infrastructure Deficiencies:** Many rural areas lack the necessary infrastructure to support renewable energy deployment.

**Policy Gaps:** Inadequate government policies and regulatory frameworks often fail to incentivize green energy initiatives.

**The Way Forward**
Addressing these challenges requires a multi-faceted approach. Governments can play a pivotal role by adopting policies to encourage renewable infrastructure and reduce import taxes on green technology. Partnerships between telecom operators, tower companies, and energy providers are also essential to develop and scale sustainable energy solutions.

Renewable energy is not just about reducing carbon footprints; it is also key to expanding digital connectivity. By investing in green power solutions, telecom operators can enhance network coverage, especially in rural areas, and support economic growth across the continent.

# DRC Signs Agreement to Boost Satellite Connectivity
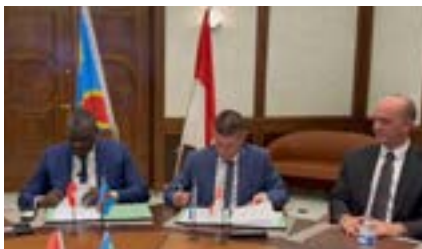


The DRC and Monacosat have signed a Memorandum of Understanding to deploy satellite connectivity, aiming to improve rural access, promote digital inclusion, and enhance education, healthcare, and economic development nationwide.

As part of digital cooperation between the Democratic Republic of Congo (DRC) and the Principality of Monaco, Congolese Minister of Posts, Telecommunications, and Digital Economy, Augustin Kibassa Maliba, signed a Memorandum of Understanding with Monacosat. The agreement focuses on deploying a satellite telecommunications network to improve connectivity, particularly in rural areas. The signing ceremony took place at Monacosat's headquarters, with a representative of the Monaco government in attendance.

This collaboration seeks to bridge the digital divide by leveraging Monacosat's satellite capacity to expand internet access in underserved regions. Monacosat highlighted the DRC's strategic position in Central Africa, emphasizing the potential to generate economic value by offering satellite services to neighboring countries.

The project's primary objectives include improving access to ICT in health and education, digitizing public services, and covering rural areas. The initiative also addresses delays in the DRC's national fiber backbone rollout, which requires nearly 50,000 kilometers of coverage.

Minister Kibassa pledged full support for the project, announcing the formation of a dedicated team for effective implementation. Satellite internet is crucial for the DRC due to its wide geographic reach, enabling better education, economic development, healthcare, and access to information in remote areas.

TELECOM Review AFRICA

# Powering the Future: Optimizing Mobile Networks in Africa

Africa's digital transformation is accelerating, with mobile networks playing a pivotal role in shaping the continent's future. As mobile connectivity becomes the primary internet gateway for millions, optimizing these networks is crucial to unlocking Africa's vast potential. From boosting economic growth to enhancing social inclusion, the strategic evolution of mobile networks is poised to power the continent's next wave of development.

TELECOM Review AFRICA

# The Driving Force of Mobile Networks

In many African nations, mobile networks have emerged as the cornerstone of digital connectivity. With over 1.2 billion mobile connections, the continent has leapfrogged traditional fixed-line infrastructure, enabling widespread access to vital services such as mobile banking, telemedicine, and e-learning. This surge in connectivity is transforming industries and improving lives, particularly in rural and remote areas where other forms of communication are scarce.

The integration of mobile networks has also had a profound economic impact. According to the GSMA, mobile technologies and services contributed over $150 billion to Sub-Saharan Africa's economy in 2022, a figure expected to grow significantly in the coming years. These networks are not only driving financial inclusion but also fostering innovation in sectors like agriculture, healthcare, and education.

## Transformative Technologies for Network Optimization

### 1. Advanced Connectivity Solutions

The deployment of 4G LTE and the rollout of 5G are revolutionizing how mobile networks operate across Africa. These technologies are delivering faster speeds and lower latency, enabling seamless streaming, real-time communication, and more efficient use of network resources. With 5G, industries such as healthcare can introduce innovations like remote surgeries, while the agricultural sector can leverage IoT devices to improve productivity.

### 2. Network Automation and AI

Automation and artificial intelligence (AI) are key to enhancing the efficiency and reliability of mobile networks. AI-driven solutions enable predictive maintenance, dynamic traffic management, and real-time monitoring, ensuring optimal performance even during peak usage periods. These advancements allow operators to deliver consistent, high-quality services while minimizing operational costs.

### 3. Dynamic Spectrum Management

Dynamic Spectrum Sharing (DSS) technology is transforming how spectrum resources are utilized. By enabling multiple generations of network technology—such as 4G and 5G—to coexist on the same spectrum, DSS maximizes efficiency and speeds up the rollout of advanced services. This innovation allows operators to offer cutting-edge connectivity without the need for extensive infrastructure overhauls.

### 4. Renewable Energy Integration

Sustainability is becoming a cornerstone of network optimization in Africa. Mobile operators are increasingly integrating renewable energy sources such as solar and wind power to run their base stations. Not only does this reduce operational costs, but it also aligns with global sustainability goals, ensuring that Africa's digital growth is both inclusive and environmentally responsible.

## Pioneering Initiatives and Partnerships

Across the continent, telecom operators and governments are partnering to bring cutting-edge mobile network solutions to life. In Kenya, Safaricom's investment in AI-driven network tools has set new benchmarks in service quality. The company's commitment to innovation ensures that even remote communities benefit from reliable mobile connectivity.

In South Africa, MTN and Vodacom are leading the charge in 5G deployment, offering unprecedented speeds and capacity. These advancements are enabling smart city initiatives and creating new opportunities for businesses and consumers alike. Meanwhile, countries like Rwanda and Ghana are exploring partnerships to enhance mobile network coverage in rural areas, further driving digital inclusion.

Regional collaborations are also playing a pivotal role. Organizations such as the African Telecommunications Union (ATU) are working to harmonize policies and spectrum allocation, ensuring that technological advancements reach every corner of the continent. This unified approach promotes efficiency and accelerates the adoption of innovative solutions.

## Catalyzing Economic Growth and Social Transformation

Optimized mobile networks are more than just technological advancements—they are catalysts for economic and social progress. Mobile financial services, such as M-PESA, have transformed how Africans manage money, giving millions access to banking services for the first time. Similarly, mobile-enabled e-learning platforms are bridging educational gaps, allowing students in remote areas to access quality education.

In the healthcare sector, mobile networks are facilitating telemedicine solutions that connect patients with doctors across vast distances. This has been particularly transformative in regions with limited access to medical facilities, improving health outcomes and saving lives.

Moreover, optimized networks are empowering small and medium-sized enterprises (SMEs), which are the backbone of Africa's economy. By providing reliable connectivity, mobile networks enable SMEs to participate in the global digital economy, opening up new markets and driving innovation.

## Shaping the Future

The optimization of mobile networks is not just about enhancing connectivity; it's about shaping the future of Africa. With each technological leap, the continent moves closer to realizing its full potential as a global digital leader. By embracing advanced connectivity solutions, leveraging AI and automation, and fostering sustainable practices, Africa is building a seamless digital ecosystem that will power its growth for decades to come.

As Africa's mobile networks evolve, their impact will extend far beyond the telecom sector. They will drive innovation, create opportunities, and transform lives, proving that the future is indeed mobile. In this exciting journey, the continent is not merely catching up with the rest of the world—it is setting the pace for global digital transformation. **TR**

# Ethiopia's Digital Shift: Projected 1.3 Trillion ETB GDP Surge by 2028

Ethiopia, Africa's second-most populous country, is embarking on an ambitious digital transformation journey, with projections indicating a potential boost of 1.3 trillion ETB (approximately $23 billion) to its GDP by 2028. This surge underscores the critical role of digitalization in shaping the nation's economic future, driven by advancements in telecommunications, fintech, e-commerce, and public service delivery.

## A Vision for Digital Prosperity

The Ethiopian government has prioritized digital transformation in its economic agenda. The Digital Ethiopia 2025 strategy aims to harness technology to drive inclusive growth, improve public services, and create a vibrant digital economy. Key initiatives include expanding internet access, fostering innovation, and enhancing digital literacy across the population.

The liberalization of Ethiopia's telecom sector, historically dominated by state-owned Ethio Telecom, marks a turning point. With the introduction of new players like Safaricom Ethiopia, competition is intensifying, driving improvements in service quality and affordability. These advancements are crucial for expanding digital access to rural areas, which host the majority of Ethiopia's population.

### The Economic Ripple Effect

Digital transformation is anticipated to impact various sectors, from agriculture and manufacturing to finance and trade. According to a recent report, Ethiopia's GDP could gain an additional 1.3 trillion ETB by 2028 due to increased productivity, new business opportunities, and enhanced service delivery enabled by digitalization.

The fintech sector is emerging as a key contributor. Mobile money services, such as Safaricom's M-PESA, are revolutionizing financial inclusion by providing unbanked populations with access to banking services. This shift not only empowers individuals but also stimulates economic activity with faster and more secure transactions.

In agriculture, digital platforms are helping farmers access real-time market information, weather forecasts, and best farming practices. By bridging the information gap, these tools enable smallholder farmers to optimize their yields and earnings.

### Job Creation and Innovation

The digital economy is also poised to be a significant job creator. As tech startups flourish, they bring new employment opportunities, particularly for Ethiopia's youth. Innovation hubs and incubators across the country are nurturing local talent, driving the development of homegrown solutions tailored to Ethiopia's unique challenges.

Moreover, digital transformation is fostering entrepreneurship. E-commerce platforms are providing small businesses with access to broader markets, both domestically and internationally. This growth in online trade is enhancing competitiveness and contributing to the country's economic diversification.

### Overcoming Challenges

Despite its promising potential, Ethiopia's digital shift faces hurdles. Infrastructure remains a major challenge, with limited broadband penetration and frequent power outages hindering seamless connectivity. To address this, the government is investing heavily in expanding the country's digital infrastructure, including the rollout of 4G and 5G networks in urban areas and improving rural connectivity.

Cybersecurity is another pressing concern. As digital adoption accelerates, so do the risks of cyberattacks and data breaches. Ethiopia's recent efforts to strengthen its cybersecurity framework aim to protect individuals and businesses, ensuring trust in the digital ecosystem.

Policy and regulatory reforms are critical for sustaining this growth. The Ethiopian government has taken steps to create a conducive environment for digital innovation, including the establishment of a regulatory framework for fintech and e-commerce. However, continuous engagement with stakeholders will be necessary to adapt to the rapidly evolving digital landscape.

### The Path Ahead

Ethiopia's digital transformation is poised to become a cornerstone of its economic future, with the potential to redefine its growth trajectory and significantly improve the quality of life for millions of its citizens. The nation stands at a pivotal juncture, where its ambitious vision could drive sustainable development and lift countless people out of poverty. If successful, Ethiopia is projected to achieve a remarkable 1.3 trillion ETB boost to its GDP by 2028, a goal that requires cohesive and strategic collaboration between the government, private sector, and international partners.

To realize this vision, Ethiopia must prioritize substantial investments in digital infrastructure, from expanding broadband connectivity to integrating advanced technologies such as artificial intelligence and blockchain. Equally important is the cultivation of a thriving innovation ecosystem, fostering homegrown startups and encouraging research and development to address local challenges.

Moreover, building an inclusive digital economy will ensure that the benefits of this transformation reach all segments of society. By bridging the digital divide, enhancing digital literacy, and supporting marginalized communities, Ethiopia can create equitable access to opportunities that drive long-term growth and resilience.

As the nation embraces this sweeping digital shift, Ethiopis could set a benchmark for digital-driven economic progress across the African continent. While the road to 2028 will undoubtedly present challenges, Ethiopia's determination and growing momentum signal a promising journey toward a digital renaissance, transforming not only its economy but also the lives of its people. **TR**

# Telecom Egypt Reports Solid Growth and Resilient Performance in Q3 2024



Telecom Egypt has announced its Q3 2024 financial results, highlighting strong revenue growth and operational resilience despite challenging market conditions.

**9M 2024 Key Highlights**
Total revenue rose by 39% year-over-year (YoY), reaching EGP 58.4 billion, driven primarily by a 46% YoY increase in data revenues, which accounted for 45% of total revenue growth. This was supported by a growing customer base and price adjustments implemented earlier in the year. International Direct Dialing (IDD) revenues surged by 61% YoY, while Capacity Sales experienced a remarkable 90% YoY growth. The customer base expanded across all segments, with Mobile growing by 9%, Fixed Broadband by 8%, and Fixed Voice by 4%. EBITDA increased by 34% YoY to EGP 23.5 billion, achieving a 40% margin in line with targets.

However, net profit declined by 6% YoY to EGP 8.6 billion, reflecting a net profit margin of 15%. In-service CapEx stood at EGP 12.8 billion (22% of sales), while Cash CapEx amounted to EGP 30.1 billion (52% of sales). The net debt-to-EBITDA ratio increased to 2.3x in 9M 2024, up from 1.7x in FY 2023, mainly due to currency depreciation. Free Cash Flow to Firm (FCFF) improved during the period, recording EGP -5.9 billion, or EGP 48 million excluding license fees, compared to H1 2024.

**Mohamed Nasr, Managing Director and Chief Executive Officer, commented:**
"Telecom Egypt has once again demonstrated its ability to navigate through a complex and challenging environment. Despite the challenging macroeconomic environment, we have successfully maintained healthy results, underscoring the strength and resilience of our business model.

Our total revenue increased by 39% YoY, reaching EGP 58.4 billion. EBITDA grew by 34% YoY, reaching EGP 23.5 billion and recording a 40% margin, thanks to strong top-line growth and effective cost-optimization measures, which allowed us to maintain margins at targeted levels despite continued inflationary pressures. However, net profit declined by 6% YoY, landing at EGP 8.6 billion, despite the strong operational growth and a 56% increase in our income from VFE, as the 3x YoY higher net finance costs caused by the devaluation of the EGP and the higher interest rates during the period pressured the bottom line.

The Retail segment continues to grow organically, driven by an expanding customer base and the implementation of price adjustments at the start of the year. Data revenue remains the primary growth engine for this segment, reflecting broader global trends. Meanwhile, the Wholesale segment is also performing well. Just this week, we signed long-term, landmark infrastructure service agreements with Vodafone Egypt, with varying maturities up to 2034, with a total value of EGP 30 billion. These agreements align with our strategic

plan to monetize our existing assets and network infrastructure.

Overall, our business remains resilient, and we are optimistic about the future, as macroeconomic conditions begin to stabilize. We are witnessing a stabilization in the exchange rate, a gradual decline in inflation, and a reduction in Federal Reserve interest rates - with local interest rates likely to follow suit. This stabilization will help enhance our financial performance moving forward. While our cost structure has risen to a new base, it has now largely stabilized, giving us clearer visibility to scale up revenue and enhance margins. On the CapEx front, our investments in subsea cables, fiber optic networks, mobile networks, and the 5G license were essential for our growth and to secure our position in the market. However, we are actively optimizing next year's expenditures and achieve healthier cash flow without hindering our revenue growth momentum.

As we approach the end of 2024, we remain focused on delivering innovative solutions and exceptional value to our customers and partners. By continuously enhancing our services portfolio, optimizing expenditures, and strategically monetizing our assets and infrastructure, we are committed to maximizing shareholder returns and driving sustainable growth across our core business lines. Confident in our ability to meet targets, we reaffirm our 2024 guidance and remain dedicated to creating long-term value for our shareholders."

# Safaricom Launches 4G Network in Nekemte



Safaricom Ethiopia has officially expanded its 4G network to Nekemte City, marking a significant milestone in its mission to extend reliable connectivity across Ethiopia.

The launch not only provides high-quality internet service powered by 32 advanced towers and a powerful fiber backbone but also creates 250 local jobs through five distributor shops and introduces M-PESA digital financial services to empower businesses and individuals.

Reinforcing its commitment to community development, Safaricom donated laptops,

Wi-Fi routers, and six months of free internet, valued at one million birr, to two high schools in Nekemte, supporting education and youth empowerment.

Safaricom expressed gratitude to the East Wollega Zonal Administration, Nekemte City Administration, and all stakeholders for their vital role in achieving this milestone.

# Orange Centrafrique Secures 4G License, Aiming to Boost CAR's Digital Connectivity

Orange Centrafrique has become the first mobile operator in the Central African Republic (CAR) to obtain a 4G license from the Ministry of Digital Economy, Posts and Telecommunications, a significant milestone for the country's telecom sector. The company called this development a "decisive step" toward launching 4G services, which will enhance service quality and expand access to digital technology for the entire population.

The initiative aligns with CAR's digital transformation strategy, which aims to bridge the digital divide, improve telecom accessibility, and support economic, educational, and social growth. Orange also emphasized that the 4G rollout is expected to attract foreign investment and foster the development of a local digital ecosystem.

"4G access is a major advancement for the people of CAR, addressing the growing demand for connectivity," said Max Francisco, General Manager of Orange Centrafrique. "We are dedicated to delivering a reliable, high-quality network that is accessible to users across all regions."

As of the end of 2021, CAR had 1.86 million mobile subscribers, all on 3G, with a penetration rate of 32%, according to Statista. Internet penetration stood at 10.6%, with approximately 616,000 users, according to Datareportal's figures from Kepios.

# Telkom SA Reports Strong Half-Year Performance, Strengthening Digital Leadership

Telkom SA SOC Limited, a leader in South Africa's digital infrastructure, announced financial results for the six months ended September 30, 2024.

The results demonstrate steady underlying operational performance, delivering sustainable financial returns while positioning the company as the backbone of South Africa's digital future.

The results reflect Telkom's successful execution of its data-led strategy, with group revenue growing by 1.9% to R21.4 billion, driven primarily by exceptional performance in data services. Mobile data revenue increased by 12.7% and fiber data service revenue rose by 15.5%.

The company's adjusted EBITDA, excluding restructuring cost of R160 million and the Telkom Retirement Fund derecognition loss of R618 million, increased by 18.3% to R5.6 billion, with the adjusted EBITDA margin improving to 26.2%, 3.6 percentage points up on the prior period.

The half-year performance has seen a significant strengthening in the balance sheet. Free cash flow turned positive at R768 million, compared to negative R478 million in the previous period. Interest-bearing debt decreased by R885 million and the net debt to adjusted EBITDA ratio improved to 1.3x from 1.8x at year end.

This half-year improvement reflects the company's enhanced operational efficiency and successful monetization of its digital infrastructure asset base.

"Our continued investment in our extensive fiber network and mobile infrastructure is now delivering the competitive advantage we anticipated, propelling our data-led strategy to ensure future-readiness," said Serame Taukobong, Group Chief Executive Officer.

The company's infrastructure investments continue to deliver significant operational results. Mobile subscribers grew by 24.6% year-on-year, surpassing 22.7 million, while mobile data subscribers increased by 19.6% to 14.6 million, driving a 12.7% rise in data revenues. Openserve's fiber infrastructure also showed strong performance, with homes passed and connected growing by 11.4% and 18.1%, respectively, maintaining a market-leading home connection rate of 49.7%. Additionally, IT revenues sustained steady growth, highlighting the effectiveness of the company's connect-led strategy.

"Our improved cash generation and a strengthened balance sheet position us well to continue investing for future growth while maintaining financial discipline," said Nonkululeko Dlamini, Group Chief Financial Officer.

"We continued with a smart capital spend of R2.5bn invested in infrastructure, which is at the heart of our strategy. The capital intensity ratio of 11.9% remains efficient and in line with our forecast of 12-15%," Dlamini added.

These investments and results enhance Telkom as the enabler of South Africa's digital economy, attracting recognition such as being named "Best Mobile Provider in South Africa" by the 2024/25 Ask Afrika Orange Index.

Telkom continues to optimize its asset portfolio, making progress in the disposal of non-core assets while focusing on high-growth areas.

TELECOM Review AFRICA

# MTN Benin Launches Nation's First 5G Network

MTN Benin officially launched the country's first commercial 5G network with initial coverage in select areas of Cotonou and Abomey-Calavi.

During the launch event, MTN Benin highlighted 5G's potential to drive digital transformation for businesses and enhance digital services across the country, particularly in streaming, gaming, and the Internet of Things (IoT).

Bolaji Adeola, MTN Benin's senior network manager, emphasized that 5G has the potential to revolutionize sectors like agriculture through smart technologies, improve healthcare access with remote care and teleconsultation, and optimize logistics services.

Chary Doumbia, MTN's business director, announced plans to expand 5G services across Cotonou and eventually to the entire nation, though no specific timeline was provided.

Ecofin noted that MTN Benin's 5G rollout is partially funded by a XOF65 billion (US$103.8 million) syndicated loan secured in July from regional financial institutions, including the West African Development Bank (BOAD), Société Générale, and BGFI Bank.

Earlier this year, MTN Group committed to investing US$215 million in Benin's infrastructure over a three-year period, following successful 5G trials in the country.

As of June 2024, data from Benin's telecom regulator ARCEP shows MTN Benin as the leading mobile operator, with over 11 million subscriptions, including 6.1 million active mobile Internet users.

# Telecom Namibia's Fiber Network Reaches Underserved Communities

Telecom Namibia is proud to announce the successful completion of eight Fiber (FTTx) projects in 2023 and 2024. These projects aim to modernize Namibia's communication infrastructure by replacing slow and outdated existing copper infrastructure that has been prone to copper theft and sabotage.

Valued at approximately N$35.5 million, these projects have resulted in the installation of 233,858 meters of fiber, enabling the connection of an additional 7,838 erven, particularly in traditionally underserved areas.

The company plans to further invest N$27 million in the 2024/25 financial year to expand its fiber network and enhance connectivity across the country. This significant investment underscores Telecom Namibia's commitment to delivering high-speed, reliable internet services to Namibian communities, thereby bridging the digital divide, particularly starting in traditionally underserved areas such as Katutura in Windhoek, Kuisebmond, and Narraville in Walvis Bay and expanding countrywide.

Telecom Namibia's expanding fiber network is poised to revolutionize various sectors of the Namibian economy. Enhanced connectivity will benefit tourism by attracting more digital nomads facilitating seamless communication between businesses and tourists. Industrial development will be accelerated through digital transformation and remote operations enabled by the high-speed fiber network. Small and medium-sized enterprises will be empowered, fostering entrepreneurship and economic growth. The healthcare sector will see improvements in telemedicine and remote healthcare services, bringing quality care to remote areas. Precision agriculture and remote monitoring will be advanced in the agricultural sector, leading to increased efficiency and productivity. Education will benefit from enhanced online learning and research capabilities, improving access to quality education. Finally, the real estate sector will experience stimulated growth and investment as fiber connectivity enhances property values and attracts businesses and residents.

Dr Stanley Shanapinda, Telecom Namibia's CEO, expressed enthusiasm about Telecom Namibia's Fibre project's positive impact: "These projects demonstrate the power of collaboration in delivering essential infrastructure improvements. We are confident the fiber network will serve as a valuable asset to Namibia for years to come."

Telecom Namibia's fiber network expansion has focused on several key regions:

- Central-North Region: With a high population density, this region has seen significant investment in Telecom Namibia's fiber infrastructure. Projects have been completed in areas such as Okahandja, Windhoek North-East, Windhoek North-West, Windhoek Rural, Windhoek CBD, and Windhoek South.

- Erongo Region: This region, particularly the coastal areas of Swakopmund and Walvis Bay, has benefited from fiber network expansion.

- Far North Region: Projects in Ondangwa and Oshakati have enhanced connectivity in this region.

- North-East Region: Areas such as Katima Mulilo, Otjiwarongo, Rundu, and Tsumeb have seen fiber network upgrades.

- South Region: The town of Oranjemund has also benefited from fiber network expansion.

# Revolutionizing Financial Investigations with the Power of AI

In an era of rapid digital transformation, artificial intelligence (AI) has become a game-changer across various industries. Among these, the field of financial investigations stands out, where the integration of AI is reshaping traditional practices, offering new tools to combat fraud, money laundering, and other financial crimes. This article delves into how AI is revolutionizing financial investigations, highlighting its benefits, challenges, and future potential.

TELECOM Review AFRICA

**T**he Growing Complexity of Financial Crimes
Financial crimes, including money laundering and fraud, have become more sophisticated, exploiting advanced technologies and global networks. Traditional investigation methods, which rely on manual analysis and rule-based systems, often struggle to keep up with the complexity and scale of these activities.

AI is transforming the fight against financial crime in telecom by enabling faster, more accurate detection and analysis. Through machine learning and predictive analytics, AI can process vast datasets, uncover hidden patterns, and flag anomalies, helping telecom operators and regulators combat illicit activities more effectively.

**How AI Transforms Financial Investigations**

1. **Enhanced Data Analysis**
   AI excels at processing large volumes of structured and unstructured data at unprecedented speed. Financial institutions generate terabytes of data daily, from transaction records to customer profiles and communications. By employing machine learning algorithms, AI can analyze this data in real time, identifying patterns and anomalies that might indicate fraudulent activities.

   For instance, anomaly detection models can flag unusual transactions, such as sudden large withdrawals or transfers to high-risk jurisdictions. These models learn from historical data, becoming more accurate over time in distinguishing between legitimate and suspicious activities.

2. **Advanced Fraud Detection**
   Fraud detection has traditionally relied on predefined rules, such as flagging high-value transactions or those involving specific countries. While useful, these rules often produce a high rate of false positives, leading to unnecessary investigations and reduced customer satisfaction.

   AI, particularly deep learning, can significantly improve fraud detection. By analyzing past fraudulent behaviors, AI systems can predict and identify new, previously unseen fraud schemes. These systems adapt dynamically, continuously learning from new data to stay ahead of evolving tactics used by fraudsters.

3. **Streamlining Investigations through Automation**
   AI-driven automation tools can handle repetitive investigative tasks, freeing up human investigators to focus on more complex cases. For example, natural language processing (NLP) enables AI systems to scan and interpret vast volumes of documents, emails, and other text-based data, extracting relevant information and summarizing findings.

   This automation accelerates the investigative process and ensures that no critical piece of information is overlooked. Investigators can access comprehensive, AI-generated reports that consolidate data from various sources, providing a clear and concise overview of the case.

4. **Improved Risk Assessment and Customer Profiling**
   AI plays a crucial role in risk assessment by evaluating customers' behavior and financial activities to determine their risk levels. Through predictive analytics, AI can forecast potential risks based on historical and real-time data, enabling financial institutions to take proactive measures.

   Additionally, AI enhances customer profiling by analyzing diverse data points, including transaction history, geographic location, and social media activity. This detailed profiling helps in identifying high-risk individuals and entities, ensuring that resources are allocated effectively.

**Real-World Applications and Success Stories**
Several financial institutions and regulatory bodies have adopted AI to strengthen their investigative capabilities against financial crimes. For instance, AI-powered systems are being used to detect money laundering by analyzing massive datasets and identifying suspicious activities with greater accuracy. Machine learning algorithms help reduce false positives, allowing investigators to focus on genuine threats.

In addition, AI-driven tools streamline complex legal documents reviews, speeding up compliance processes and uncovering potential misconduct. Law enforcement agencies also leverage AI to track cross-border financial crimes, analyzing global transaction data to uncover criminal networks and enhance international cooperation.

**Challenges and Ethical Considerations**
While AI offers immense potential, its adoption in financial investigations is not without challenges.

1. **Data Privacy and Security**
   AI systems require access to vast amounts of sensitive data, which raises concerns about data privacy and security. Financial institutions must ensure that their AI tools comply with data protection regulations such as the GDPR and CCPA, safeguarding customers' personal information.

2. **Bias and Fairness**
   AI models are only as reliable as the data they are trained on. If the training data contains biases, the AI system may inadvertently perpetuate these biases, leading to unfair outcomes. For

instance, biased algorithms could disproportionately flag transactions from certain regions or demographics as suspicious.

To address this, financial institutions must prioritize transparency and fairness in AI development, regularly auditing their models for potential biases.

3. **Regulatory Compliance**
The rapid evolution of AI technology poses challenges for regulatory frameworks, which often lag behind technological advancements. Financial institutions must navigate a complex regulatory landscape to ensure that their AI systems comply with local and international laws.

Collaborative efforts between regulators, financial institutions, and technology providers are essential to establish guidelines that promote the responsible use of AI in financial investigations.

### The Future of AI in Financial Investigations

As AI continues to evolve, its role in financial investigations will only grow more significant. Emerging technologies such as explainable AI (XAI) are poised to address some of the current challenges, offering greater transparency and interpretability of AI decision-making processes. This will help build trust among regulators, institutions, and the public.

Moreover, the integration of AI with blockchain technology holds promise for enhancing the transparency and traceability of financial transactions. Smart contracts powered by AI could automatically detect and prevent fraudulent activities in real time.

In the long term, AI is expected to play a central role in creating a more secure and resilient financial ecosystem. By enabling faster, more accurate investigations, AI empowers financial institutions and law enforcement agencies to stay ahead of criminals, protecting the integrity of the global financial system.

AI is revolutionizing financial investigations, providing powerful tools to combat the growing sophistication of financial crimes. From enhanced data analysis and fraud detection to automation and improved risk assessment, AI's unprecedented capabilities are transforming the investigative landscape.

However, the journey is not without challenges. Financial institutions must navigate issues related to data privacy, bias, and regulatory compliance to fully realize AI's potential. With continued innovation and collaboration, AI will undoubtedly play a pivotal role in shaping the future of financial investigations, making the fight against financial crime more effective than ever. **TR**

> AI is expected to play a central role in creating a more secure and resilient financial ecosystem

TELECOM Review AFRICA

# Algeria's Connectivity Revolution:
## 4G for 1,400 Rural Communities

Algeria is making a bold move toward digital inclusion, with an initiative to deliver 4G connectivity to 1,400 underserved rural communities. This transformative project aims to close the urban-rural digital gap, driving economic growth, boosting social inclusion, and improving living standards for millions.

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**T**ransforming Life in Rural Algeria

For years, rural areas across Algeria have struggled with limited internet access, restricting their integration into the digital economy. The rollout of 4G networks in these regions promises to change this dynamic. High-speed internet will revolutionize communication, while unlocking new possibilities in areas like education, healthcare, and commerce.

Students in remote villages who previously had to travel long distances for educational resources can now access online learning platforms, digital libraries, and virtual classrooms from home. Similarly, rural health clinics will be able to use telemedicine, connecting patients with medical specialists without the need for time-consuming travel to urban hospitals.

### Boosting Economic Potential

The economic benefits of expanding 4G coverage are significant. Local entrepreneurs and small businesses stand to gain from enhanced connectivity, allowing them to tap into e-commerce platforms, expand customer bases, and streamline transactions through mobile payment systems.

Agriculture, a critical sector for rural Algeria, will also experience a technological boost. With access to real-time market prices, weather updates, and farming best practices through mobile apps, farmers can improve productivity and manage risks more effectively. The potential for integrating smart farming technologies, such as sensors and automated systems, further underscores the value of reliable 4G networks in improving efficiency and sustainability.

### Collaborative Efforts Powering the Initiative

This digital transformation is driven by a collective effort involving government agencies, telecom providers, and international technology firms. The Ministry of Post, Telecommunications, and Digital Technology has been instrumental, offering financial incentives and regulatory support to fast-track the deployment of rural 4G infrastructure.

Major telecom operators, including Algérie Télécom, and Ooredoo, have played a vital role in extending coverage. By deploying advanced technologies and innovative strategies, these companies have overcome logistical challenges to bring high-speed internet to Algeria's most remote and rugged regions.

International partnerships with companies like Huawei and Ericsson have also been critical. These collaborations have provided cutting-edge network equipment and technical expertise, enabling the rollout of reliable and scalable 4G networks.

### Overcoming Deployment Challenges

Expanding 4G networks into rural areas is not without its hurdles. From rugged terrains to harsh weather and high infrastructure costs, the project has faced numerous logistical and financial challenges.

To overcome these hurdles, Algeria has implemented innovative solutions like solar-powered base stations, reducing reliance on conventional power sources and lowering operational costs. Additionally, the government has introduced subsidies to encourage private sector investment in rural connectivity projects.

Another significant challenge is ensuring that rural populations are equipped to take full advantage of the internet. Bridging the digital divide requires more than just infrastructure; it demands investment in digital literacy. Various training programs are being implemented to help residents develop the skills needed to benefit from their new connectivity.

### Paving the Way for a Digital Future

Algeria's plan to connect 1,400 rural communities aligns with its broader goal of becoming a leader in digital transformation within the region. By 2030, the government aims to provide near-universal internet access, fostering a more inclusive digital economy.

This initiative is expected to have profound social implications. Reducing the digital divide between urban and rural populations will promote greater social cohesion and create new opportunities for marginalized groups, including women and young people. Access to information, education, and employment will empower these communities, enabling them to actively participate in the country's development.

Algeria's 4G expansion project underscores the profound impact that connectivity can have on society. By introducing high-speed internet to some of the country's most isolated and underserved areas, this initiative is not merely addressing a technological gap—it is laying the foundation for widespread social and economic transformation. Enhanced connectivity is a catalyst for sustainable growth, driving innovation and creating new opportunities across various sectors.

As these communities embrace the digital world, they will gain access to critical resources, services, and networks that were previously out of reach. This shift will not only improve individual livelihoods but also strengthen the broader social fabric, paving the way for a more connected, resilient, and empowered society. Algeria's vision for a digitally inclusive nation is steadily becoming a reality, positioning the country as a leader in leveraging connectivity for transformative change. **TR**

# Ericsson and Ethio Telecom Roll Out 5G in Hawassa, Boosting Innovation and Economic Growth



Ericsson and Ethio telecom have launched 5G in Hawassa, Ethiopia, marking a major milestone in the city's Information and Communications Technology (ICT) landscape and further strengthening the century-old partnership between the two companies.

The 5G network is powered by Ericsson Radio System products and solutions, laying the groundwork for future Fixed Wireless Access (FWA) applications and spectrum-sharing capabilities. This network expansion will support Ethio telecom in addressing the growing demands of consumers and enterprises for scalable, more reliable, and faster connectivity.

With its higher speed and lower latency, 5G will pave the way for a multitude of transformative innovations. From faster internet and e-health services to online education and entertainment, 5G is set to change how citizens in Ethiopia access information and communicate.

Moreover, by harnessing the potential of real-time data transmission, enterprises will have the chance to deploy cutting-edge services, capitalizing on new revenue streams and propelling economic growth. Key industrial sectors in the region will gain access to seamless automation, revolutionizing their operations by enhancing efficiency, ensuring safety, and unlocking substantial cost savings.

"The launch of 5G in Hawassa, Ethiopia marks a significant step forward in empowering residents, businesses, and enterprises with unprecedented opportunities," said Frehiwot Tamru, Chief Executive Officer of Ethio telecom. "From revolutionizing industries to bridging the digital divide, 5G promises to transform how Ethiopians live, work, and interact. Ethio telecom is proud to lead this digital revolution and build on its successful collaboration with Ericsson, which has achieved numerous connectivity milestones over the years. This partnership aligns with Ethio telecom's LEAD Growth Strategy, paving the way for innovative solutions that will elevate Ethiopia's communications landscape and support the strategic vision of achieving a Digital Ethiopia."

"5G is a game-changing technology that will reshape industries and empower individuals like never before," added Todd Ashton, Vice President and Head of Customer Unit South and East Africa, Ericsson Middle East and Africa. "Ethio telecom's 5G network in Hawassa, powered by the advanced Ericsson Radio System portfolio, will enable seamless connectivity and real-time data transmission, unlocking new opportunities for enterprises to innovate and create revenue streams. Citizens will benefit from faster access to information and services, driving productivity and economic growth. As Ethiopia steps further into the digital economy, Ericsson remains committed to supporting Ethio telecom in expanding 5G capabilities across the nation, fostering sustained collaboration to advance Ethiopia's technological future."

# Nokia Set to Roll Out Rural Connectivity Solutions Across Africa



Nokia is prepared to support local networks and operators with a dedicated rural connectivity solution ready for implementation.

Artificial intelligence took center stage among attendees and exhibitors, reflecting its undeniable impact in 2024. While AI remains a primary focus, another pressing issue, particularly within the African context, is rural connectivity.

"Nokia is actively developing solutions and partnering with several operators across Africa to launch rural sites and bridge the digital divide," Naveed Kashif emphasizes. "Our sites are versatile and can even be deployed by tower companies, offering them as a leasing service to provide rural connectivity to all operators. Additionally, we aim to make these sites multi-tenant," he explains.

Addressing the unique challenges of implementing such solutions in South Africa, Kashif highlights the country's distinct power issues. "We've adopted a hybrid power model that integrates solar panels with a wind-powered generator and a small battery pack. This approach allows us to address South Africa's energy challenges effectively," he says.

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# Cisco Launches Female-Focused ForgeX EDGE Centre in Johannesburg



Cisco announced the launch of a new EDGE Centre in Johannesburg in partnership with ForgeX.

It is the 8th EDGE Centre launched locally by the networking technology specialists and is part of the larger Cisco Country Digital Acceleration (CDA) program. The company has been working closely on this program with the Department of Communications and Digital Technologies (DCDT) as part of a larger objective to stimulate innovation and support South African SMMEs, particularly those that are female-led.

Through the new EDGE Centre, Cisco and ForgeX will be providing access to its latest connectivity and collaboration technology, as well as resources for training and enablement programs to local businesses.

Other incubation and support-focused initiatives launched by Cisco locally include WomHub, which is the first female-led incubator in South Africa dedicated to promoting gender equality and supporting women in STEM.

Cisco also notes that since the inception of the first EDGE Centre in 2019 in South Africa, they have developed 200 local SMME partnerships and supported in creating 104 jobs.

"The new center will be equipped with Cisco technology, enabling local businesses to connect with global Cisco experts. Additionally, Cisco Networking Academy, one of the world's longest-standing IT-skills-to-jobs programs, will provide training opportunities on skills development, digital literacy, and cybersecurity certifications," the company confirmed in a release to Hypertext.

"With ForgeX, our shared vision is to create a new network of certified Cisco partners offering innovative technology solutions to the South African market. This collaboration reflects our goal of supporting South Africa's digital economy, expected to comprise nearly 20% of GDP by 2028," added Conrad Steyn, Country Digital Acceleration leader at Cisco South Africa.

# Ericsson Mobility Report: 5G Expansion and 6G Projections Through 2030



5G Standalone (5G SA) and 5G Advanced are expected to be key focuses for communications service providers (CSPs) for the remainder of the decade as they introduce new capabilities to create offerings centered on value delivery over data volume. The analysis is included among a wealth of statistical network insights in the November 2024 edition of the Ericsson Mobility Report, which extends the forecast period to the end of 2030.

While the rate of mobile network traffic data growth is declining—estimated at 21 percent year-on year for 2024—it is

still expected to nearly triple by the end of 2030 from present day numbers.

Globally, 5G networks are expected to carry about 80 percent of total mobile data traffic by the end of 2030, compared to 34 percent by the end of 2024. The Gulf Cooperation Council (GCC) countries are set to have 47 percent 5G subscription penetration by 2024.

It is projected that the GCC will have the highest 5G penetration in 2030 at 93 percent, followed closely by Western Europe at 92 percent and North America at 91 percent.

With high mobile penetration, urbanization, and strong consumer purchasing power, the GCC region's economic outlook remains favorable, driven largely by sectors such as tourism, technology, and renewable energy.

In the telecom industry, a key trend is the transformation of service providers from traditional telcos to technology companies. This transition is being fueled by the rollout of 5G, enabling the introduction of advanced services, including AI and the cloud solutions and services, factory automation and content delivery where network slicing will be critical in delivering these services. High-performance networks, application programming interfaces (APIs) and a vibrant developer community are expected to drive growth.

Through 2030, overall mobile subscriptions in the GCC countries are forecast to grow at an annual rate of 3 percent, reaching 95 million. By the end of the decade, 93 percent of all subscriptions are expected to be 5G, with 88 million users adopting this technology.

# Boosting Cybersecurity in Ghana: The Role of Public-Private Partnerships

As Ghana continues to accelerate its digital transformation journey, cybersecurity has become a cornerstone for sustainable economic and social growth. The rapid integration of digital technologies into governance, commerce, education, and communication has revolutionized the way the country operates. From enhancing government transparency through e-governance platforms to driving financial inclusion with mobile money services, digital innovations have unlocked significant opportunities for individuals and businesses alike. However, this technological progress also brings heightened vulnerabilities, exposing critical systems and sensitive data to escalating cyber threats.

The risks are evident in various sectors: targeted phishing scams undermine trust in financial institutions, ransomware attacks jeopardize essential services, and data breaches expose personal information in healthcare and government databases. These incidents highlight the increasing urgency for powerful and comprehensive cybersecurity measures to protect Ghana's digital ecosystem. Addressing such challenges requires a multifaceted approach that leverages the strengths of both public institutions and private enterprises.

At the heart of Ghana's cybersecurity strategy is the emphasis on public-private partnerships (PPPs). By uniting the regulatory expertise, policy frameworks, and resources of the public sector with the technical innovation, funding, and specialized knowledge of private companies, these partnerships offer a powerful way to bolster the nation's cyber resilience.

### An Overview of Ghana's Cybersecurity Ecosystem

Ghana's digital economy has grown exponentially over the past decade. The widespread adoption of mobile money, e-commerce, and cloud-based solutions has revolutionized the way Ghanaians interact and conduct business. However, this rapid digital expansion has also created fertile ground for cyber threats.

Despite ranking among Africa's top performers in cybersecurity, according to the Global Cybersecurity Index (GCI), Ghana faces persistent vulnerabilities. To address these, the government has implemented frameworks like the National Cybersecurity Policy and Strategy (NCPS). However, combating cyber threats at scale requires a collaborative approach—one that involves leveraging the strengths of both public institutions and private organizations.

### The Importance of Public-Private Collaboration

Public-private partnerships bring together the resources, expertise, and innovation of government bodies and private entities to create a stronger cybersecurity ecosystem. While governments establish regulatory frameworks and policies, private organizations contribute advanced technologies, innovative solutions, and financial investments.

Key benefits of PPPs for Ghana's cybersecurity include:

#### √ Pooling Resources for Maximum Impact

Budget restrictions can hinder government efforts to implement comprehensive cybersecurity measures. Private companies in sectors such as telecom, fintech, and technology can support these efforts by providing essential funding and infrastructure.

#### √ Leveraging Industry Expertise

Cyber threats evolve at an alarming pace, requiring sophisticated solutions. Private sector firms specializing in cybersecurity bring the necessary expertise and cutting-edge tools to counter these challenges effectively.

#### √ Swift and Coordinated Response to Threats

Partnerships enable real-time sharing of threat intelligence, allowing for faster detection and mitigation of cyberattacks. This reduces potential damage and ensures a more resilient system.

#### √ Strengthening Human Capital

A shortage of skilled cybersecurity professionals remains a significant obstacle. Private sector collaboration can help address this gap by offering training programs, mentorship opportunities, and knowledge-sharing initiatives.

### Examples of Successful PPPs in Ghana

Ghana has already begun fostering successful collaborations in cybersecurity through several initiatives:

### National Cyber Security Centre (NCSC)

The NCSC plays a central role in coordinating Ghana's cybersecurity efforts. It works closely with telecom providers, financial institutions, and other private stakeholders to establish security standards and promote information sharing.

### Cybersecurity Awareness Campaigns

Events such as the annual Cybersecurity Awareness Month bring together government agencies and private entities to educate citizens and businesses about best practices for online security.

### Collaboration with Global Technology Leaders

Partnerships with international firms like Microsoft, IBM, and Huawei have equipped Ghana with advanced cybersecurity tools and resources. These collaborations also include capacity-building programs and technical support tailored to local needs.

### Challenges in Strengthening Public-Private Cooperation

While PPPs hold immense potential, certain barriers hinder their effectiveness in Ghana's cybersecurity landscape:

### 1. Lack of Cohesive Coordination

Fragmented efforts among stakeholders often lead to inefficiencies and duplicated initiatives. A unified approach with clear objectives and defined roles is necessary to maximize impact.

### 2. Limited Trust Between Sectors

Mistrust around data sharing, regulatory compliance, and differing priorities can discourage private companies from fully engaging in government-led initiatives. Transparency and mutual understanding are critical for bridging this gap.

### 3. Regulatory and Legal Gaps

Although Ghana has made strides in developing cybersecurity legislation, gaps in enforcement and clarity can deter private sector participation. Strengthening these frameworks will create a more enabling environment for collaboration.

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**4. Shortage of Skilled Professionals**
A shortage of qualified cybersecurity experts limits the ability of both sectors to deploy advanced defenses. Without significant investment in education and training, this challenge will persist.

**Strategies to Strengthen Cybersecurity Partnerships**
To realize the full potential of PPPs, Ghana must adopt targeted strategies to address these challenges and foster a culture of collaboration:

**• Offer Incentives for Private Sector Involvement**
Financial incentives such as tax breaks, grants, or subsidies encourage companies to invest in cybersecurity infrastructure and initiatives.

**• Build Trust Through Clear Agreements**
Establishing transparent guidelines for data handling, compliance, and risk-sharing will help align the interests of public and private stakeholders. Joint task forces or advisory boards also promote open communication.

**• Enhance Legal Frameworks**
Continuous refinement of cybersecurity laws and policies is essential to foster accountability and provide clarity on roles and responsibilities.

**• Prioritize Skills Development**
A national focus on cybersecurity education, including scholarships, internships, and training workshops, can help build a strong talent pipeline. Collaborative efforts between academia, industry, and government will be crucial.

**• Embrace Regional and Global Partnerships**
Cybersecurity is a shared challenge. Ghana can benefit from engaging with regional bodies like the African Union and international organizations to exchange best practices and resources.

**A Path Toward a Secure Digital Future**
Ghana's digital ambitions hinge on a secure foundation. Public-private partnerships provide a powerful framework to strengthen the nation's cybersecurity ecosystem by pooling resources, expertise, and innovation. While challenges persist, the progress achieved through existing collaborations offers a blueprint for future efforts.

With a shared commitment to protecting critical digital infrastructure, Ghana's government and private sector can work together to ensure the safety and resilience of the country's digital economy. By instilling trust, investing in talent, and embracing innovation, Ghana is well-positioned to navigate the complexities of cybersecurity and achieve its vision of a thriving, digitally connected society. **TR**
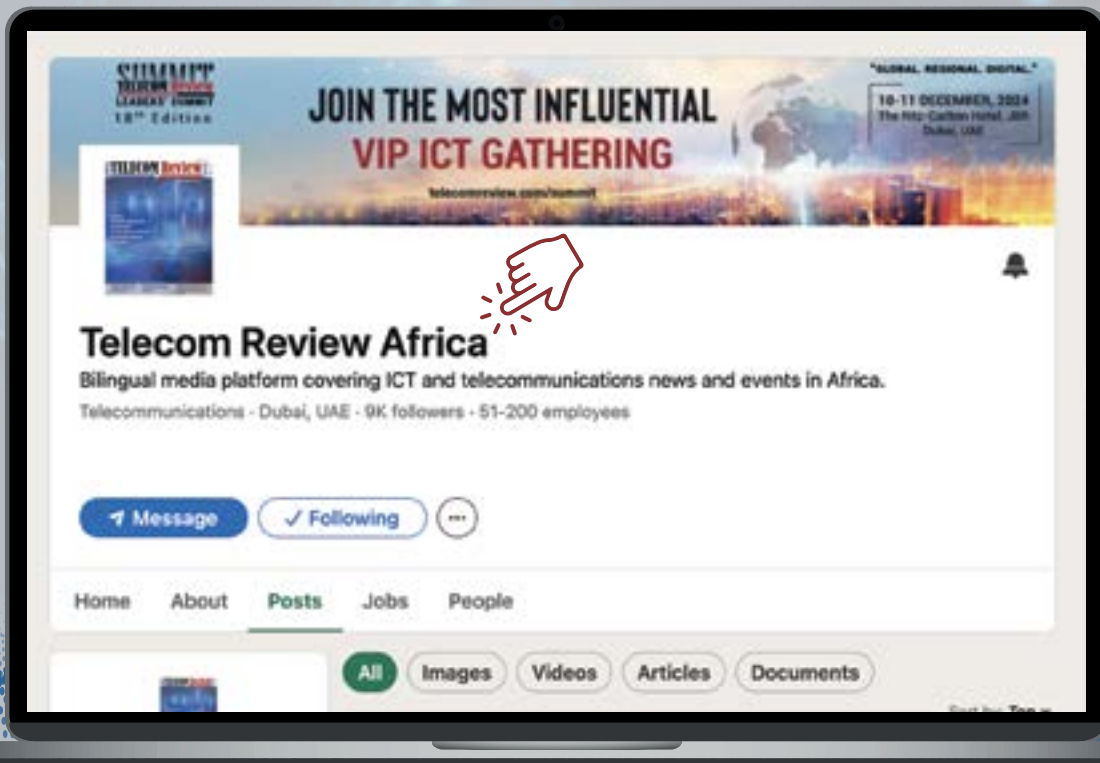
# Mastering Multi-Cloud: Streamlined Solutions for Complex Environments

In the fast-paced digital era, businesses are increasingly turning to multi-cloud strategies to gain a competitive edge through efficiency, flexibility, and innovation. Rather than depending solely on a single cloud provider, this approach enables organizations to leverage the unique strengths and capabilities of various platforms, tailoring solutions to meet the specific demands of diverse workloads. Whether it's optimizing storage, enhancing computational power, or deploying AI-driven tools, multi-cloud environments offer unparalleled customization and scalability.

However, this flexibility comes at a cost. The advantages of multi-cloud are often accompanied by significant challenges, including complex integrations, intricate management requirements, and heightened security risks. Without proper planning and tools, these obstacles can undermine the very benefits multi-cloud seeks to deliver. To truly master the complexities of multi-cloud environments and unlock their full potential, businesses must embrace streamlined solutions designed to simplify operations, enhance oversight, and fortify security, all while ensuring seamless interoperability across platforms.

## The Rise of Multi-Cloud Adoption

Businesses are adopting multi-cloud strategies to achieve agility in a competitive market. Unlike single-cloud deployments, multi-cloud environments provide:

- **Avoidance of vendor lock-in:** Companies can diversify their cloud service providers to prevent over-reliance on one vendor.

- **Tailored solutions:** Different platforms excel in specific areas, enabling businesses to optimize performance by choosing the best-fit service for each application or workload.

- **Enhanced disaster recovery:** A distributed infrastructure allows businesses to minimize downtime and ensure data redundancy.

In practice, this means an enterprise may use one cloud provider for artificial intelligence (AI) workloads, another for storage solutions, and a third for customer-facing applications. By diversifying their cloud infrastructure, businesses can maximize their technological potential and remain competitive in a digital-first world.

## Challenges of Multi-Cloud

While the benefits of multi-cloud are clear, managing it is far from simple. Key challenges include:

- **Complexity of integration:** Ensuring seamless communication between multiple cloud platforms requires significant effort. Applications hosted on different providers must work together without sacrificing performance or user experience.

- **Lack of centralized management:** Managing multiple environments can become overwhelming without unified tools to monitor, control, and optimize usage.

- **Heightened security risks:** Each platform introduces unique vulnerabilities, increasing

the surface area for potential cyberattacks.

- **Cost management:** Without proper oversight, costs can spiral as businesses juggle pricing models from multiple providers.

## Streamlined Solutions for Multi-Cloud

To overcome these challenges, organizations need a structured approach and tools that simplify operations while maximizing the benefits of multi-cloud.

### 1.Unified Management Platforms

A centralized management system is critical to streamlining multi-cloud environments. These platforms provide a single pane of glass for monitoring usage, performance, and costs across multiple providers. Features such as automated workflows, predictive analytics, and real-time dashboards enable IT teams to stay on top of their infrastructure.

Popular tools like VMware's vRealize Suite, Google Anthos, and Microsoft Azure Arc allow businesses to integrate and manage multi-cloud environments efficiently. They provide visibility into resource allocation and help prevent over-provisioning or underutilization.

### 2. Automation and Orchestration

Manual processes can significantly slow down operations in a multi-cloud setup. Automation is a game-

changer, enabling businesses to streamline tasks such as deployment, scaling, and updates. Orchestration tools, such as Kubernetes, further enhance efficiency by automating the management of containerized applications across multiple clouds.

Automation not only reduces human error but also ensures that resources are allocated dynamically based on workload demands, optimizing both cost and performance.

### 3. Comprehensive Security Framework

Operating in multiple cloud environments increases the complexity of maintaining security and compliance. A fragmented approach to security—where each platform is managed in isolation—can leave businesses vulnerable to threats.

To address this, companies should implement security solutions that span all their cloud environments. Zero Trust architecture, where every access request is verified regardless of its origin, is an increasingly popular approach. Additionally, solutions like Cloud Security Posture Management (CSPM) tools help identify misconfigurations and ensure compliance with regulations across multiple platforms.

Encryption, identity and access management (IAM), and continuous monitoring are also essential components of a powerful multi-cloud security strategy.

### 4. Cost Optimization

One of the biggest pitfalls of multi-cloud is cost inefficiency. Different providers have varying pricing structures, making it challenging to predict and control expenses. FinOps—a financial management approach for cloud environments—can help businesses optimize costs by aligning cloud spending with organizational goals.

Through regular cost analysis, resource tagging, and waste reduction strategies, companies can identify unused resources and adjust their usage to avoid unnecessary spending.

### Real-World Success Stories

Several organizations have successfully navigated the complexities of multi-cloud environments. For instance:

*   **A global retail company** integrated its e-commerce platforms using a combination of AWS and Google Cloud services. By leveraging the strengths of each provider, it achieved faster load times and improved customer experiences while using a centralized monitoring tool to manage operations seamlessly.

*   **A financial services firm** implemented multi-cloud security frameworks to comply with strict regulations. By adopting Zero Trust principles and CSPM tools, it reduced security risks and improved audit readiness across its platforms.

These success stories highlight the potential of streamlined solutions in enabling businesses to maximize the benefits of multi-cloud environments.

### Looking Ahead: The Future of Multi-Cloud

As businesses continue to embrace digital transformation, multi-cloud adoption will only grow. Emerging technologies such as artificial intelligence (AI), edge computing, and serverless architecture are poised to enhance the capabilities of multi-cloud environments. AI-powered analytics, for example, can predict workload demands and optimize resource allocation in real time.

Additionally, the rise of industry-specific clouds—platforms tailored to the needs of specific sectors like healthcare or manufacturing—offers further opportunities for customization and efficiency.

However, to fully capitalize on these advancements, businesses must remain proactive in addressing the inherent complexities of multi-cloud. Investing in training, fostering a culture of collaboration between IT and business teams, and staying updated on the latest tools and trends are all essential steps.

Multi-cloud environments empower businesses with agility and innovation. By enabling organizations to harness the strengths of multiple providers, they open new possibilities for optimization and growth. However, mastering multi-cloud requires overcoming challenges related to integration, management, and security.

Streamlined solutions—such as unified management platforms, automation, comprehensive security frameworks, and cost optimization strategies—are the key to simplifying complex environments. As businesses adopt these solutions, they can unlock the full potential of multi-cloud and position themselves for success in a rapidly changing digital landscape. **TR**

> By enabling organizations to harness the strengths of multiple providers, they open new possibilities for optimization and growth

# Connecting the Sahel: Innovative Telecom Strategies for Remote Areas

The Sahel region, a vast and complex landscape stretching across the southern edge of the Sahara Desert, is home to diverse cultures, unique ecosystems, and a population striving for progress amid formidable challenges. This sprawling belt, covering parts of over a dozen countries from Senegal in the west to Sudan in the east, features an arid climate, sparse vegetation, and harsh conditions. Life in the Sahel is marked by resilience, with communities adapting to extreme weather, resource scarcity, and the challenges of living in remote, underserved areas.

However, the region's remoteness is not just geographical—it extends into digital isolation. Limited infrastructure, coupled with socio-economic and political barriers, has long hindered efforts to connect the Sahel's widely dispersed populations to the broader digital world. These barriers perpetuate challenges in accessing essential services such as education, healthcare, and financial tools, widening the gap between urban centers and rural communities.

Despite these difficulties, the Sahel is undergoing a quiet revolution. A growing wave of innovative telecom strategies is reimagining connectivity in one of the world's most challenging regions. From leveraging cutting-edge satellite technologies to deploying renewable energy-powered infrastructure, stakeholders are finding creative ways to bridge the digital divide. These telecom efforts are not just transforming access to communication—they are unlocking new possibilities in education, healthcare, economic empowerment, and governance for millions of people. The promise of a digitally connected Sahel is no longer a distant dream but a rapidly approaching reality, bringing hope and opportunity to one of the most underserved regions in the world.

**Connectivity Challenges in the Sahel**
Spanning over a dozen countries, including Mali, Niger, Chad, Burkina Faso, and Mauritania, the Sahel faces a unique set of hurdles:

- **Dispersed Communities:** The low population density makes building and maintaining traditional telecom infrastructure, such as cell towers and fiber networks, both logistically and financially challenging.

- **Harsh Environment:** The desert climate poses technical challenges, making infrastructure installation and maintenance difficult.

- **Political Instability:** Ongoing conflicts disrupt infrastructure development and pose risks to investments and personnel.

- **Economic Limitations:** Widespread poverty reduces the commercial viability of telecom projects, with limited consumer purchasing power further discouraging investment.

**Why Connectivity Matters**
Despite these challenges, the demand for connectivity in the Sahel has never been greater. Mobile technology is emerging as a vital tool for addressing pressing socio-economic issues, such as limited access to healthcare and education. It is also driving agricultural productivity, enabling financial inclusion, and improving governance by fostering communication between governments and citizens.

Connectivity supports regional integration, enhances resource management, and promotes trade, paving the way for long-term economic growth.

**Innovative Telecom Solutions**
To bridge the connectivity gap, stakeholders are employing cutting-edge technologies, empowering communities, and encouraging collaboration.

**1.Satellite Internet Solutions**
Low-earth-orbit (LEO) satellites from providers like Starlink, OneWeb, and Eutelsat are revolutionizing connectivity by delivering high-speed internet to underserved regions. LEO satellites offer reduced latency, making them suitable for applications such as online learning and telemedicine.

**2.Solar-Powered Telecom Infrastructure**
Solar energy plays a critical role in powering mobile base stations in remote areas without reliable electricity. By reducing dependency on diesel generators, solar solutions cut costs and environmental impacts.

**3.Community Networks**
Local initiatives are training residents to build and maintain telecom networks. These community-driven projects create a sense of ownership and foster sustainable connectivity.

**4.Public-Private Partnerships (PPPs)**
Governments and private sector

players are collaborating to share resources and expertise, facilitating large-scale infrastructure projects.

### 5. Mobile-Based Services for Development

Beyond infrastructure, mobile platforms are offering targeted solutions for development:

- *mHealth:* Telemedicine apps connect patients in rural areas to healthcare professionals.

- *mAgriculture:* Farmers access real-time weather forecasts and market prices, improving decision-making and productivity.

- *mFinance:* Mobile money platforms like M-PESA enable financial transactions in areas lacking traditional banking services.

### The Role of Governments and International Support

Recognizing the transformative potential of telecom connectivity, governments in the Sahel are introducing policies that encourage investment and innovation. These measures include tax incentives for telecom operators, subsidized infrastructure development, and streamlined regulations.

International organizations and financial institutions are also stepping in to fill funding gaps. For example, the World Bank's Digital Economy for Africa (DE4A) initiative is channeling resources to enhance digital infrastructure across the continent, with a strong focus on underserved regions like the Sahel.

### Emerging Technologies Shaping Connectivity

The future of connectivity in the Sahel is being shaped by a wave of technological advancements:

• **5G Networks:** Although primarily urban at present, 5G could eventually extend its benefits to rural areas, enhancing speeds and capacity.

• **AI and IoT Applications:** Smart devices and AI-driven analytics are helping optimize agriculture and manage resources efficiently.

• **Edge Computing:** By processing data closer to users, edge computing reduces dependence on high-speed connections to centralized data centers.

### Bridging the Digital Divide

The digital divide remains a pressing challenge, despite promising technological advancements. Bridging this gap requires addressing deep-rooted socio-economic disparities, including literacy barriers, limited access to affordable devices, and unequal digital literacy levels. Policies and initiatives that prioritize inclusivity, education, and affordability are critical to ensuring that the benefits of connectivity reach everyone, especially those in underserved regions.

Nowhere is this challenge more evident than in the Sahel, a region where connecting communities is not just a technological feat but a transformative endeavor. This effort has the potential to uplift entire populations, providing access to opportunities and encouraging long-term socio-economic growth. Innovative solutions like satellite internet, solar-powered networks, and mobile services are breaking down barriers, enabling even the most remote areas to integrate into the global digital ecosystem.

Fostering partnerships between governments, private companies, and local communities is key to overcoming these challenges. These collaborations bring together resources, expertise, and a shared vision for a connected future. Community-driven initiatives demonstrate the importance of local involvement in crafting solutions that meet the unique needs of the region.

As these connectivity efforts gain momentum, the Sahel is taking meaningful steps toward bridging its digital divide. The results go beyond improved internet access—communities are empowered with tools to drive innovation, access education, and improve healthcare. By embracing inclusivity and investing in sustainable connectivity, the Sahel is building a brighter, more equitable digital future for its people. ⬛
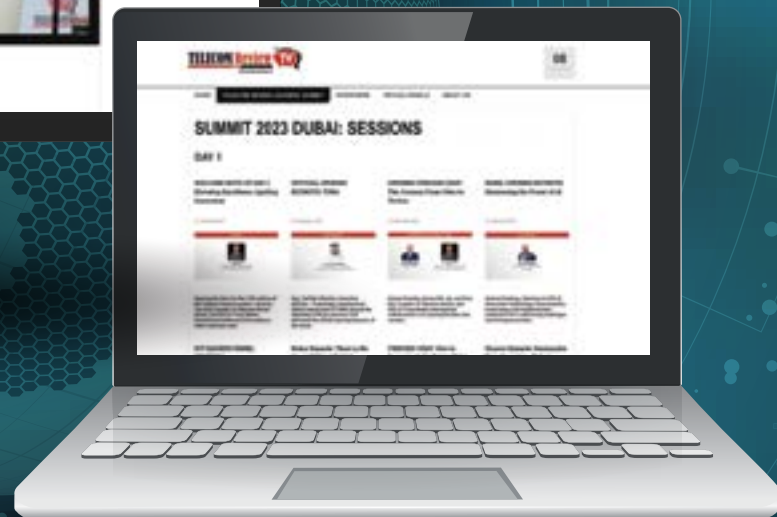
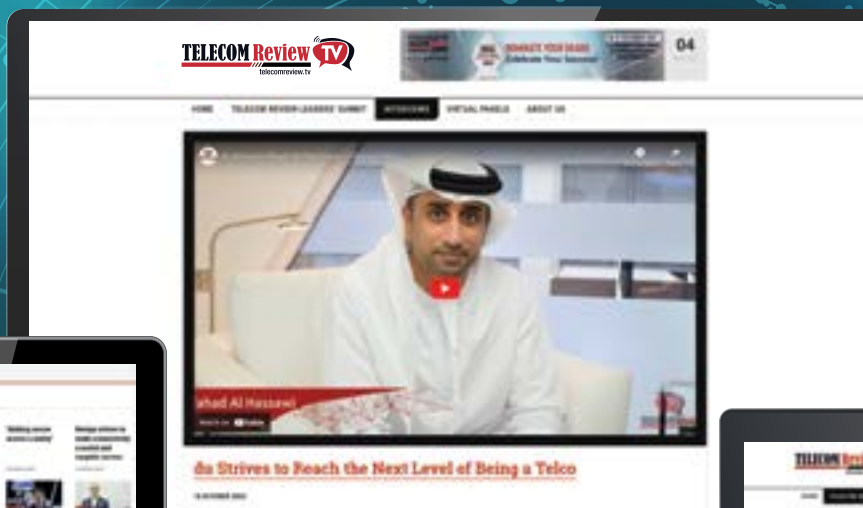## MWC Barcelona 2025



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