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- Hyperconnected Ecosystems in Africa: Fueling Innovation and Growth
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Paving the Long Road to 5G: Africa's Connectivity Quest

Across much of the world, 5G technology has already catalyzed transformations in industries and everyday life with lightning-fast speeds, ultra-low latency, and enhanced connectivity options. Countries in Asia, Europe, and North America are leveraging 5G for a myriad of applications, from smart cities and autonomous vehicles to advanced telemedicine and immersive augmented reality experiences. In contrast, African nations are largely still navigating the shift to 4G, with the transition from 2G and 3G networks underway but progressing unevenly. This isn't a reflection of a lack of ambition or potential; rather, it's a complex issue influenced by unique socioeconomic, regulatory, and technological challenges.

As of now, many African countries still rely heavily on 2G and 3G networks, which, while adequate for basic voice communication and SMS, cannot support the data-intensive applications that are becoming standard in today's digital age. In several regions, the average mobile internet speeds lag significantly behind the global average, posing substantial barriers to economic growth and digital inclusion. However, with Africa's burgeoning youth population, untapped economic potential, and growing demand for digital services, the continent is poised for a connectivity revolution that could reshape its future.

This feature explores the barriers African countries face in adopting 4G and eventually 5G technology, the socioeconomic drivers behind the demand for faster mobile networks, and the pathways that could accelerate Africa's digital transformation. By addressing these challenges and leveraging opportunities, Africa could not only catch up with the global digital landscape but also leapfrog to more advanced technologies, enhancing its economic resilience and overall development.

State of Connectivity Across African Countries

Africa's connectivity landscape is still largely dominated by 2G and 3G networks, which meet the basic communication needs of many people through voice calls and text messaging. However, these older technologies are increasingly inadequate for the growing data demands of digital services, e-commerce, education, and various mobile applications. As of 2023, only about 30% of Sub-Saharan Africa's mobile connections utilized 4G, with some urban centers beginning to experiment with 5G on a limited scale. This statistic highlights a significant gap compared to other continents, where 4G and 5G connectivity have become standard.

Countries like Kenya, South Africa, and Nigeria have made notable progress in rolling out 4G networks. For instance, Kenya has emerged as a regional leader in mobile money services, leveraging its 4G infrastructure to facilitate innovations like M-PESA, which has transformed access to banking. South Africa boasts a relatively advanced telecommunications infrastructure, particularly in urban areas, while Nigeria's major cities are beginning to experience faster mobile internet speeds.

However, the rollout of 4G in many African nations remains in its infancy. Countries such as Zimbabwe, Sudan, and Somalia continue to rely heavily on 2G and 3G technologies, hindered by infrastructure limitations and economic challenges. Rural populations often face unreliable connectivity, which limits their ability to participate in the digital economy.

The economic and regulatory landscapes significantly influence connectivity in Africa. Many governments struggle with funding and investment challenges in telecommunications infrastructure. High costs associated with deploying new technologies, combined with limited public funding, hinder the expansion of 4G networks into underserved regions. Regulatory environments vary dramatically, affecting the speed and effectiveness of network deployment. In countries with unstable regulatory frameworks, telecommunications companies may hesitate to invest, fearing increased costs and bureaucratic hurdles.

In contrast, nations with more stable regulatory environments, such as Ghana and Rwanda, have made significant progress in expanding their telecommunications infrastructure. By implementing policies that promote competition and innovation, these countries have attracted foreign investments, bolstering digital development. Their success serves as a model for others striving to enhance connectivity.

To bridge the digital divide, a multifaceted approach is needed. Expanding access to affordable devices and mobile data is crucial for increasing 4G adoption. Telecom operators can collaborate with manufacturers to develop low-cost smartphones, while governments can promote the import of affordable devices. Digital literacy initiatives are also essential for empowering individuals and communities to leverage improved connectivity.

Despite the challenges, the potential for a connected future in Africa is immense. The continent's youthful population is increasingly tech-savvy and demands access to digital services, presenting opportunities for growth and innovation. With the right investments and policies, African nations can advance their telecommunications infrastructure, facilitating a smoother transition from 2G and 3G networks to 4G and eventually 5G.

As connectivity improves, Africa can harness digital technologies for economic growth, social development, and an improved quality of life. Initiatives aimed at fostering public-private partnerships, regulatory reform, and infrastructure investment will be critical in shaping a more connected and equitable future. By addressing disparities in access, investing in infrastructure, and promoting digital literacy, Africa can pave the way for a future that fosters innovation and empowers communities across the continent.

Barriers to 4G Adoption in Africa

1. Affordability of 4G Devices and Data Services

In many African countries, one of the most significant barriers to 4G adoption is the cost of 4G-compatible devices. Basic feature phones, typically limited to 2G or 3G, are prevalent because they meet basic communication needs at a lower price point. In a region where average incomes are substantially

> The continent's youthful population is tech-savvy and demands access to digital services, presenting opportunities for growth and innovation

lower than global levels, affordability is a major factor in determining device choice.

While the average cost of a 4G smartphone in Africa has declined in recent years, the price remains prohibitive for many. Even low-cost 4G devices, priced around $50–$100, are beyond the reach of a substantial portion of the population, especially in areas where daily incomes are as low as a few dollars. For those who manage to acquire a 4G-compatible phone, data costs are often prohibitively high, limiting their access to internet services. The issue of affordability is compounded by heavy import taxes on electronic goods in many African countries, further raising the price of smartphones and mobile devices.

In Egypt, Ghana, and Nigeria, mobile operators have introduced financing options for purchasing 4G smartphones to lower the barrier to entry. Programs offering installment payments or discounts for prepaid users have helped increase 4G adoption, though uptake remains slower in lower-income segments.

2. Investment Gaps in Telecommunications Infrastructure
A major challenge in deploying 4G across Africa is the lack of sufficient telecommunications infrastructure. In advanced markets, where 2G and 3G infrastructure is being phased out in favor of 4G and 5G, the cost of developing and maintaining mobile networks is shared by a broad consumer base and supported by high levels of public and private investment. However, in many African countries, where a large portion of the population still relies on basic cellular services, the financial incentive for telecommunications companies to build costly 4G infrastructure is limited.

Furthermore, building telecom infrastructure in Africa is complex and often expensive. Remote areas and geographically challenging terrains—such as the Sahel region, dense rainforests, and expansive deserts—increase operational costs. Additionally, inadequate power grids force telecom companies to rely on alternative energy sources, increasing operational costs and slowing down network expansion efforts.

In countries like Mozambique, Chad, and the Democratic Republic of Congo, infrastructure investment is complicated by ongoing political instability and security concerns. For telecom companies, these factors add to the financial risk, making rural expansion less feasible and contributing to the persistent urban-rural connectivity divide.

3. Regulatory and Policy Challenges
Regulatory issues significantly impact the expansion and affordability of 4G networks across Africa. Effective spectrum allocation, which is crucial for high-quality 4G connectivity, is inconsistent across African countries, and is often delayed by bureaucratic processes or political influence. High licensing fees and complex regulatory frameworks further hinder telecom

> Initiatives aimed at fostering partnerships, regulatory reform, and infrastructure investment will be critical in shaping a more connected future

operators' ability to expand 4G networks. For instance, in Nigeria and South Africa, telcos have faced challenges in obtaining licenses or have encountered high taxes on revenue, which can limit their ability to reinvest in network infrastructure.

Another regulatory challenge comes from the mandate for SIM card registration, which, while critical for security, has often faced logistical hurdles. In countries like Uganda and Tanzania, where national IDs are required for SIM registration, delays in obtaining IDs have led to disruptions in mobile services, affecting users' access to connectivity.

The lack of a consistent policy framework across African countries also discourages cross-border investments in telecommunications infrastructure. Harmonizing telecom regulations across regional economic communities, such as the East African Community (EAC) and the Economic Community of West African States (ECOWAS), could streamline network expansion efforts and reduce costs, benefiting both operators and consumers.

4. Economic Limitations and Low GDP

Africa's economic profile directly impacts 4G adoption and the eventual transition to 5G. With GDP per capita significantly lower than in other regions, many African countries face limited public and private sector funding to support 4G infrastructure expansion. Telecom providers are often hesitant to invest heavily in regions where low-income levels may not provide sufficient return on investment.

Economic limitations also affect consumers' purchasing power. In many cases, families prioritize basic necessities over discretionary expenses like internet data or new mobile devices. This gap in disposable income, coupled with inflation and economic instability, results in lower smartphone penetration and slower adoption of 4G services.

In countries such as Burundi, South Sudan, and Niger, where GDP levels are among the lowest in the world, telecom companies focus primarily on basic communication services, so the transition to 4G remains slow and incremental. Moreover, limited government funding and strained national budgets make it difficult for public sectors to assist with infrastructure projects, leaving telecom operators to bear the costs of network development alone.

5. Corruption and Governance Challenges

In some African countries, corruption and mismanagement within public and private institutions impact the allocation and distribution of funds for telecommunications infrastructure. Government contracts for network expansion and licensing deals can be subject to bribery or favoritism, limiting fair competition and hindering the pace of technological advancement.

In countries with high levels of corruption, such as Somalia and

Guinea-Bissau, funds allocated for network development are often misappropriated, delaying projects and discouraging foreign investors from entering the market. Additionally, telecom operators in these regions are often reluctant to commit to long-term projects, fearing financial losses due to governance issues.

Technological Advancements: The Role of eSIMs in Connectivity

eSIM technology is gradually emerging as a potential solution to increase connectivity in Africa. By eliminating the need for physical SIM cards, eSIMs could streamline the process of changing carriers, particularly for people in rural and remote areas where access to SIM cards and mobile service centers is limited. However, for eSIM adoption to be successful, it requires compatible devices, stable connectivity, and regulatory support.

Currently, eSIM adoption in Africa is low due to the high cost of compatible devices and limited availability in African markets. Telcos and governments must collaborate to create policies that encourage the production and import of affordable eSIM-compatible phones to expand connectivity.

The Rising Demand: Africa's Youth as a Catalyst for Change

Africa is home to the world's youngest population, with over 60% of the continent under the age of 25. This youth demographic is digitally aware, eager for new technology, and represents immense potential for economic transformation. The growing demand from this segment of the population is pushing governments and telecom operators to expand connectivity and accelerate 4G and eventually 5G rollout.

In countries like Ghana, Nigeria, and Kenya, young people are driving the rise of tech startups, mobile banking, and e-commerce, creating a powerful digital economy that depends on high-speed internet. This demand from Africa's youth has become a strong motivator for telecom providers to invest in digital infrastructure, as a connected youth population could drive economic growth and social development across the continent.

Looking to the Future: Africa's Path to 5G

The road to 5G in Africa is undoubtedly a long one, yet there are reasons to be optimistic. Governments, international organizations, and private stakeholders are increasingly collaborating to overcome challenges and pave the way for advanced connectivity solutions. Initiatives like the African Union's Digital Transformation Strategy aim to accelerate digital inclusion across the continent by 2030, with targets for expanding mobile broadband access, internet affordability, and local infrastructure development.

Many African nations are also exploring partnerships with global tech companies and international organizations to address the financial and technological barriers to connectivity. Investments from China's Huawei and the African Development Bank, for instance, have been directed at building infrastructure in rural and underserved regions. Furthermore, mobile operators such as MTN and Vodacom are investing in pilot 5G networks in select cities, testing the feasibility and impact of higher-speed connectivity.

The availability of more affordable smartphones is also expected to improve, as companies focus on developing low-cost 4G- and 5G-compatible devices specifically for the African market. With advancements in manufacturing and import policies, affordable smartphones will likely become more accessible, allowing a larger portion of the population to connect to 4G and eventually 5G networks.

Africa's Digital Transformation on the Horizon

Africa's journey from 2G/3G to 4G, and eventually to 5G, is marked by unique challenges but also immense potential. The path forward will require substantial investment, regulatory reforms, and a focus on making devices and data more affordable. The young population's demand for better connectivity and digital services will continue to drive this transformation, pushing telecom providers and policymakers to address the barriers that have long held back network advancement.

While 5G may be on the distant horizon, the widespread adoption of 4G across the continent is already creating a more connected, economically empowered Africa. Overcoming these challenges will require a concerted effort among African governments, private sector players, and international partners to lay the groundwork for a digitally inclusive future. As Africa's 4G quest continues, the continent is inching closer to a digital transformation that could unlock unprecedented opportunities for growth and development across the region. TR

> eSIM technology is gradually emerging as a potential solution to increase connectivity in Africa

Samia Bendali Amor, Director, IT Network Services Consulting Department, Sofrecom

Circular Economy an Opportunity or an Obstacle to Africa's Digital Transformation

Information and communication technologies (ICT) have revolutionized all of our lives. The way we communicate, shop, entertain ourselves, manage administrative procedures and financial services, take care of ourselves, learn, and work has undergone an unprecedented transformation, accelerated by the COVID crisis. This digital transformation has enabled inclusion and made many previously inaccessible services available to millions of people, particularly in Africa.

The use of ICTs in Africa, which will continue to increase in the coming years at an average annual growth rate of over 6%, has already led to the import of large volumes of electrical and electronic equipment to build information highways (telecoms and computer networks) and provide access to digital services via various means (computers, mobiles, tablets, etc.).

As Africa's digital transformation continues, it is accumulating waste electrical and electronic equipment (WEEE, or WEEEW), with no effective or controlled local solutions for reducing and processing it. Today, barely 1% of WEEE is processed in Africa, and this waste has a very high carbon footprint; processing it through existing informal channels exposes those involved to serious health and environmental risks. Consequently, local management of WEEE represents a real economic, environmental and health challenge.

The circular economy makes it possible to sustainably manage product life cycles. On the one hand, it is a lever for pursuing the growth of digital technology, and on the other, it provides the raw materials needed to manufacture new products. Reconditioning products—repairing, testing, certifying, repackaging—when possible, extends their lifespan and reduces their cost. A reconditioned smartphone can cost 30 to 40% less than a new one. When repair is no longer possible, the product is then recycled—dismantling components and extracting raw materials. For example, from a dozen recycled smartphones, it is possible to extract 130g of gold and 700g of silver; 85% of a smartphone can be recycled.

Africa lacks the capacity to recondition and process waste and suffers from a clear technological gap in this area. In fact, only a small portion of used materials is collected locally, and the majority is exported to processing centers outside of Africa. As a result, local operators are deprived of access to quality reconditioned, certified and affordable equipment that meets their needs.

The circular economy is a solution for pursuing the continent's digital transformation in a sustainable way, and it's a winning approach if we provide the conditions for the success of this paradigm shift. It's an opportunity to bring the informal WEEE processing market under control, to create new jobs and to make digital technology accessible to a greater number of people in a sustainable way, while optimizing raw materials, reducing health risks, and protecting the environment.

Several circular economy initiatives are currently underway in Africa:

- The project to create a D3E recycling plant in Cameroon (Project WEEECAM) has put informal sector workers back to work in a legal and secure environment, providing them with a regular income. The plant employs around a hundred people and processes over 2,000 tons of waste a year. It's the first plant of its kind in all of Africa, and while it won't be enough to meet the needs of the entire continent, it's a model that can be replicated.
- Cooperation between the Emmaüs association, Orange, a telecom operator, and Morphosis, a D3E recycling company, enables the collection of end-of-life cell phones in Ivory Coast, Benin, Burkina Faso and Niger. The collected products are transferred to France for recycling.

To move towards an inclusive and sustainable model, Africa needs to step up its efforts to formalize the waste treatment market by regulating the informal sector, define all the regulatory tools needed to promote a green economy, provide training in responsible consumption from an early age, promote innovation and capitalize on successful experiences around the world.

The transformation towards a virtuous and circular model requires substantial funding to develop the waste reconditioning and treatment industry, educate young people, raise public awareness, and provide training to acquire the necessary skills. The UNDP and the most well-known donors are very attentive to these projects and are ready to finance them, as these are priority subjects as defined in the Paris agreements.

And finally, it's clear that the digital and circular economies are allies and need each other. More specifically, data and AI will enable us to analyze and improve the various product lifecycle models, and to robotize industrial reconditioning and recycling lines. The circular economy will optimize resources and reduce costs as the digital transformation continues. TR

James Semple, Senior Manager, Telecom, Media & Technology, PMP Strategy UK

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What Goes into the Meta Cloud?

Cloud adoption in Africa is set for rapid growth by the end of the decade. PMP Strategy forecasts suggest a >30% CAGR in hyperscaler demand from 2023-2030, resulting in over 1,400 MW of live capacity across the continent to serve the needs of hyperscalers alone. Driving these trends are a confluence of factors, including economic growth, the need for digital transformation, and the benefits of cloud computing seen for many years now in more mature markets.

Added to the inherent challenges faced by African enterprises, such as significant data center infrastructure investment required to meet demand, a range of differing regulatory environments, and limited end-to-end connectivity services, is the fact that cloud adoption is becoming increasingly complex due to the growing need for organizations to implement clouds from multiple providers.

The concept of the meta cloud, which integrates and manages multiple cloud services and environments, offers a promising solution. As

implementations of the meta cloud remain nascent, this article speculates on some of the key enablers and components of the meta cloud in the context of Africa.

Key Developments to Support the Meta Cloud in Africa

1. Cloud Services: Major cloud players like AWS, Microsoft Azure, and Google Cloud offer powerful and scalable services that can support African enterprises. While the only fully deployed cloud regions in Africa are located in South Africa, larger-scale deployment will likely soon take place across Nigeria, Kenya, Egypt, and Morocco, where hyperscaler local zones have already been deployed. Huawei, Oracle, Alibaba, and Akamai's initial deployments are also likely to grow across the continent, adding to the complexity of choice in public cloud solutions.

2. Connectivity Solutions: Reliable and high-speed internet connectivity is crucial for effective cloud operations. Investments in subsea cables and terrestrial networks are improving connectivity across the continent. For instance, the deployment of new submarine cables like 2Africa and Equiano has significantly increased the total rolled-out capacity, enhancing connectivity between Africa and other continents.

   Content Delivery Networks (CDNs) help reduce latency and improve the delivery of popular content, enhancing user experience and performance. Akamai and Cloudflare are examples of CDNs that have established a presence in Africa, providing faster and more reliable content delivery.

3. Data Centers: Over 700 MW of additional capacity has been announced to be live by 2030 to meet the rocketing demand from hyperscalers and enterprises—more announcements will undoubtedly be made. Establishing data centers within African countries helps reduce latency, comply with data sovereignty laws, and improve service reliability. Edge data centers bring computing resources closer to end-users. South Africa, Nigeria, and Kenya are leading the way with significant investments in data center infrastructure from the likes of Teraco, OADC, Africa Data Centers, Vantage, and MDXi.

Key Tools to Consider in the Meta Cloud in Africa

1. Orchestration and Management Tools: Kubernetes, Terraform, and Ansible are popular tools for managing and orchestrating cloud services across multiple providers. These tools enable seamless integration and management of services, reducing complexity and improving efficiency, and will be important for realizing the meta cloud in Africa.

   Multi-Cloud Management Platforms enable seamless integration and management of services from different cloud providers, simplifying operations and reducing complexity. For example, Cloudify and RightScale (now part of Flexera) offer multi-cloud management solutions that could support African enterprises in managing their cloud environments.

2. Monitoring and Analytics: Solutions like Prometheus and Grafana help monitor the performance and health of cloud services. These tools provide real-time insights into system performance, enabling proactive management and optimization.

   Analytics platforms provide real-time insights, enabling proactive management and optimization of cloud resources. For example, Google Analytics and AWS CloudWatch offer real-time data insights that help African enterprises make informed decisions.

3. Data Integration and Management: Tools like Apache Kafka and Talend facilitate data integration across different cloud environments. These tools ensure smooth data flow and integration, enabling better decision-making and operational efficiency.

   Ensuring data consistency and synchronization is vital for seamless operations and decision-making. African enterprises are increasingly adopting data synchronization solutions to ensure data integrity and reliability.

4. Cost Management: Solutions like CloudHealth and AWS Cost Explorer help track and optimize cloud spending, ensuring cost-efficiency. These tools provide detailed insights into cloud costs, enabling African enterprises to manage their budgets effectively.

5. DevOps and CI/CD Tools: Tools like Jenkins and GitLab CI/CD support continuous integration and deployment, enhancing development efficiency and agility. These tools enable African enterprises to streamline their development processes and deliver high-quality software faster.

The meta cloud presents a transformative opportunity for African enterprises, offering a way to manage multiple cloud environments effectively and efficiently, particularly as the cloud environment rapidly evolves across the continent. Developers need to familiarize themselves at an early stage with the evolving essential tools, infrastructure, and environment for the meta cloud in the near term. The meta cloud looks set to drive digital transformation, enhance operational efficiency, and unlock new growth opportunities across the continent. TR

Mary Kambo, Certified Cybersecurity Engineer

Empowering Women in Cybersecurity: Insights from Mary Kambo

As Africa's digital landscape grows, cybersecurity becomes increasingly vital. Mary Kambo, a Certified Cybersecurity Engineer, is leading efforts to create opportunities for women and underrepresented groups in the field. In this exclusive interview with Telecom Review, she discusses the importance of capacity building, breaking barriers in education, ethical AI integration, and the power of mentorship in shaping Africa's future cybersecurity workforce. Through her work and experiences, Mary advocates for a more inclusive and diverse cybersecurity industry.

How can capacity building programs in cybersecurity create sustainable career pathways for women and underrepresented groups?

Capacity building programs are essential in creating sustainable career pathways for women and underrepresented groups in cybersecurity. They provide targeted cybersecurity training that equips participants with the technical and non-technical skills needed to thrive in a rapidly evolving field.

In the African ICT landscape, capacity building transcends mere training; it serves as a springboard for sustainable careers. Such programs can create sustainable career pathways for women and underrepresented groups by partnering with local organizations, educational institutions, and industry leaders, to develop tailored programs that address specific challenges faced by these groups. Additionally, mentorship and networking opportunities within these programs can foster community support, enabling participants to navigate the job market effectively. This holistic approach not only enhances skills but also encourages a sense of belonging in a traditionally male-dominated space, paving the way for long-term career success.

As a beneficiary of capacity building programs like the Cybergirls Program, (Cohort 2) by Cybersafe Foundation, I've seen firsthand the transformative impact that these initiatives can have. They have been instrumental not only in my journey but also in the journeys of many young women across Africa. These programs provide essential technical skills, mentorship, and networking opportunities that empower participants to thrive in the cybersecurity field.

What barriers do women and underrepresented groups face in cybersecurity education, and how can they be overcome?

In Africa's cybersecurity education landscape, women and underrepresented groups face significant barriers, including deeply ingrained socio-cultural norms, persistent economic disparities, systemic biases within educational institutions, and limited access to mentorship opportunities and visible role models. These challenges can hinder career development and restrict exposure to industry insights. However, there is an emerging progressive culture that seeks to rise above these obstacles.

To dismantle these barriers, there is a need to implement targeted outreach initiatives that promote cybersecurity education in schools and community centers. Actively promoting this education at the grassroots level is essential to ensuring accessibility

and engagement from an early age. Offering flexible learning options can accommodate diverse schedules and needs, while fostering a supportive community is crucial to creating an inclusive environment where everyone feels welcome.

Additionally, mentorship programs and industry partnerships can provide invaluable guidance and exposure, helping to level the playing field. In my experience, I was privileged to join impactful mentorship programs early in my career, such as Women in Cybersecurity East Africa by Standard Chartered and Strathmore University, as well as the Women in Cybersecurity Mentorship Program by the ITU. These initiatives have been instrumental in shaping the careers of many African women in cybersecurity by fostering connections with experienced professionals who are passionate about supporting and advancing women in the field.

Capacity-building programs are reducing economic barriers and making access to cybersecurity educational resources and industry-recognized certifications more attainable by providing scholarships and financial aid to students. Moreover, public-private sector collaboration is essential in addressing the challenges faced by women and underrepresented groups in the African ICT landscape, ensuring that resources and opportunities are equitably distributed.

Furthermore, creating inclusive environments where diverse voices are heard and valued can help dismantle stereotypes and encourage more individuals to pursue careers in cybersecurity. Collaboration with established female professionals in the field can inspire the next generation and create a supportive network.

Ideally, industry experts can give back to the community by committing to empower the new generation of cybersecurity professionals. I'm humbled to have played this role in my career as a cybersecurity instructor, training the next generation of cybersecurity professionals who were part of a rapid tech skills program by KIEP-SKIES.

By implementing these strategies, we can empower more individuals to pursue careers in cybersecurity and build a more diverse workforce.

What approaches can be implemented to ensure AI integration in cybersecurity adheres to ethical guidelines and maintains user privacy?

Incorporating AI into cybersecurity demands a vigilant approach to ethics and privacy, particularly in the African context where data protection frameworks may be nascent. To ensure ethical AI integration in cybersecurity, we must prioritize transparency, accountability, fairness and user consent.

Fostering a culture of ethical awareness within organizations, supported by training and education on responsible AI use, can enhance compliance with privacy regulations and build trust among users. I recently had the privilege of attending the Open Source Software & Responsible AI for Public & Private Sector Training, conducted by The African Advanced Level Telecommunications Institute (AFRALTI) in partnership with Mozilla's Africa Mradi Initiative. This training provided valuable insights into the responsible development and deployment of AI technologies.

It's encouraging to see organizations taking the initiative to equip professionals with the skills and knowledge needed to navigate the complexities of AI integration. This commitment to responsible AI use will be critical as we continue to harness the power of AI in cybersecurity and beyond. You can read more about my thoughts on this in my article, "Securing AI in the Workplace: A Guide to Preventing Data Leaks While Maximizing AI Benefits."

How do AI tools contribute to enhancing cybersecurity measures, and what are the best practices for their responsible use?

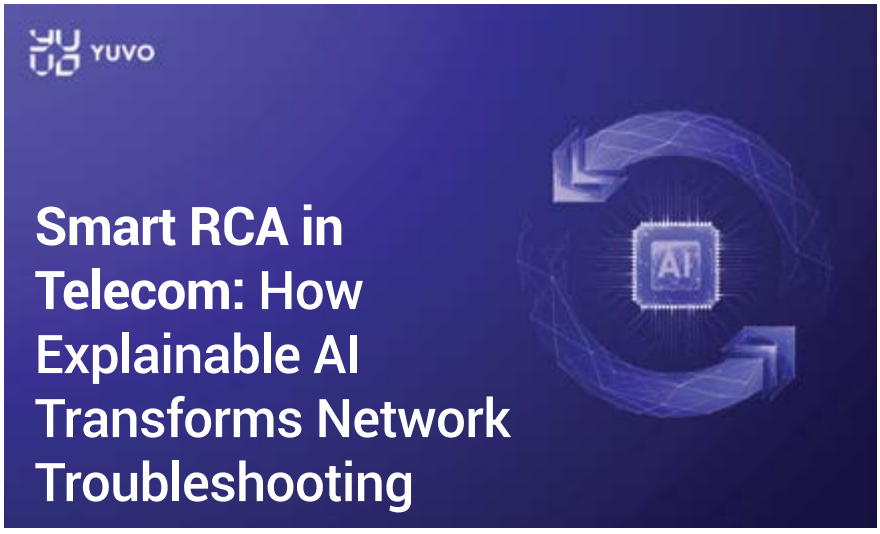
AI tools significantly enhance cybersecurity measures by automating threat detection, analyzing vast datasets in real-time, automating routine tasks and predicting potential vulnerabilities. They can identify patterns and anomalies that human analysts might miss, allowing for quicker incident response.

However, responsible use of AI is paramount and involves implementing best practices such as regular audits of AI algorithms to ensure fairness, transparency in decision-making processes, and maintaining human oversight in critical areas. Training cybersecurity professionals to understand AI's limitations is also essential, fostering a balanced approach that combines human intuition with AI efficiency. Collaboration between cybersecurity experts and AI developers is key to maximizing the benefits while minimizing the risks.

How can cybersecurity education integrate AI to better equip a diverse workforce for future challenges, particularly in responsible AI governance?

AI literacy is no longer optional in cybersecurity. We need to embed AI concepts and tools into cybersecurity curricula, equipping students with the skills to navigate this evolving landscape. Curricula should include foundational AI concepts alongside practical applications in cybersecurity contexts.

Emphasizing responsible AI governance—covering ethical considerations, privacy, and regulatory frameworks—will empower a diverse workforce to leverage AI's potential while upholding the highest standards of integrity. Collaborative projects that involve real-world AI implementations can provide hands-on experience while fostering teamwork and cross-disciplinary skills. By promoting diversity in these educational settings, we can cultivate a workforce that not only understands AI technology but also prioritizes ethical considerations in its application. TR



Smart RCA in Telecom: How Explainable AI Transforms Network Troubleshooting

In today's data-intensive telecom landscape, operators face constant fluctuations in key performance indicators (KPIs), alarms, and network failures. Identifying the root causes of these issues is critical to maintaining optimal network performance and ensuring high-quality service. However, this task is often complex due to the multitude of variables involved.

To address this challenge, Yuvo integrates Explainable AI (XAI) techniques into VCause Analysis (RCA) solution. This advanced approach enables telecom operators to not only pinpoint the most probable root causes but also understand why certain patterns emerge, ensuring faster and more accurate resolutions.

The Automated Root Cause Analysis Process

Our RCA solution starts with a machine learning (ML) model trained to understand the dynamics of a specific KPI—whether it be network latency, packet loss, or user throughput. Using historical network data, the model learns how various factors influence KPI behavior. Beyond merely predicting future KPI values, the model's true strength lies in explaining the underlying causes when a KPI exceeds its normal thresholds.

Once the model is calibrated, we use SHAP (SHapley Additive exPlanations) to analyze how different factors contribute to KPI anomalies, providing operators with clear, actionable insights into the root causes of network issues.

Prediction Model Development

In the telecom sector, KPIs are influenced by many interconnected variables. Factors like user traffic, configuration changes, and environmental conditions all impact performance, but their exact relationships can be difficult to define. This is where AI excels.

At Yuvo, we leverage machine learning to map these complex dependencies, effectively discovering the "formula" that drives KPI behavior. Our prediction process involves ingesting vast amounts of historical and real-time network data from multiple layers, including the control plane, user plane, and network configurations. This data serves as the foundation for training robust models that capture the intricate dynamics of KPIs.

However, AI's real value goes beyond prediction; it lies in explaining why certain network behaviors occur. This aspect is critical for telecom operators who must trust the AI-driven insights.

Explainable AI: Bridging the Gap Between Data and Decisions

While AI models can detect patterns and predict KPI trends, it's the explainability of those predictions that transforms data into actionable insights. At Yuvo, transparency is key. Our models not only forecast KPI deviations but also provide logical explanations for the factors driving these anomalies.

This level of explanation is essential for two key reasons:

1. **Building Trust:** Telecom experts—our Subject Matter Experts (SMEs)—need to understand the reasoning behind AI recommendations. XAI reveals the AI model's "thought process," aligning its logic with the real-world expertise of SMEs, fostering trust in the system.
2. **Unlocking New Insights:** Often, AI uncovers patterns that even experienced engineers might not anticipate. These "Aha" moments occur when the model reveals hidden correlations, offering fresh perspectives and opening new avenues for network optimization and management.

By providing clear explanations alongside predictions, our solution enhances decision-making, blending AI-driven insights with the deep operational expertise of telecom professionals.

SHAP: Unveiling Key Drivers Behind KPI Anomalies

SHAP is a game-theory-based technique that breaks down AI predictions, offering a transparent view of how each feature influences a KPI. In simple terms, SHAP treats every feature—such as network configuration parameters, user activity, or alarms—as a "player" in a game, distributing the model's

prediction (the "payout") among these features based on their contribution.

For instance, if there's a spike in network latency, a SHAP analysis can pinpoint whether the primary driver was a surge in user load, a configuration change, or an alarm trigger. This clear attribution helps operators quickly understand the root causes of anomalies, enabling targeted actions to resolve the issue.

By making AI model outputs interpretable, SHAP enhances trust, allowing operators to confidently address deviations in KPI behavior.

SME-Designed Decision Trees

Identifying the root cause of KPI anomalies is more complex than simply mapping factors to outcomes. Different vendors define counters in varying ways, and KPIs such as reliability, integrity, and availability each require tailored approaches. To address this complexity, Yuvo's SMEs have encoded their deep telecom knowledge into structured decision trees that guide the RCA process.

Each decision tree organizes network factors (or counters) into specific paths, with each path representing a potential root cause defined by a unique combination of counters. These paths are scored based on the aggregation of individual counters' SHAP values, allowing the system to rank potential root causes and prioritize the most likely contributors to KPI breaches. This structure generates more accurate and actionable insights, even across different vendors and network elements.

Furthermore, our decision trees are customized for different KPIs. For example, a tree designed for network reliability may focus on hardware and traffic congestion, while a tree for data integrity might emphasize transmission errors or packet loss. This customization ensures our RCA solution is precisely tailored to the needs of each network, enabling operators to act quickly and confidently.

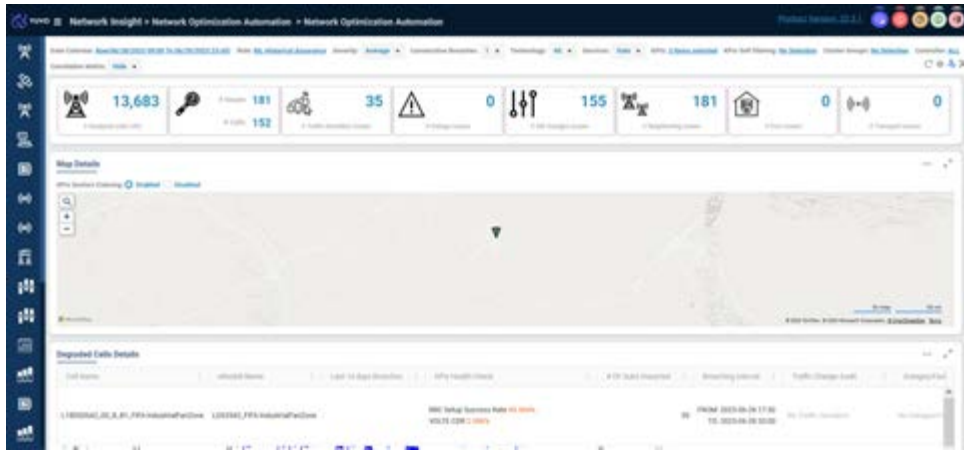
Benefits of Explainable AI in Root Cause Analysis

Yuvo's use of XAI in RCA delivers several key advantages for telecom operators:

- **Enhanced Decision-Making:** With clear explanations of how various factors impact KPIs, operators can act decisively, addressing the true drivers of network performance issues.
- **Faster Time-to-Resolution:** By identifying the root causes of anomalies, operators can directly target issues, reducing downtime and improving overall reliability.
- **Improved Trust in AI Systems:** XAI provides transparency, ensuring human operators can confidently rely on AI-driven recommendations.
- **Scalability:** The explainability framework can be applied across multiple KPIs, ensuring consistent, scalable RCA processes across different network segments.

Dashboards for Actionable Insights

Our Network Insight (NI) platform provides operators with interactive dashboards that visualize the results of the Automated Root Cause Analysis process. These dashboards offer both high-level overviews and granular details, allowing operators to quickly interpret insights and take action:



As illustrated in the above, the integration of XAI into Automated Root Cause Analysis plays a crucial role in building the trust telecom operators need to confidently embrace AI-driven solutions. By providing transparent and understandable insights into network anomalies, XAI goes beyond simple predictions, enabling stakeholders to trust and act on AI-driven recommendations.

Yuvo's solution, backed by mathematically grounded methods and decision trees crafted by telecom experts, offers a clear, data-backed approach to effectively addressing network issues. TR

South Africa's Push for Universal Broadband Access

Minister of Communications and Digital Technologies, Solly Malatsi, announced plans to prioritize broadband connectivity in South Africa's empowerment efforts. He intends to issue a policy direction to ICASA under the Electronic Communications Act, focusing on boosting investment in affordable broadband, especially for underserved and low-income communities.

World Bank data shows that a 10% increase in broadband penetration can boost GDP by 1.21% in middle-income countries like South Africa. Minister Malatsi highlighted two key initiatives: reducing regulatory barriers for broadband investment and lowering the cost of smart devices to expand 4G and 5G access.

The policy will be open for public comment after consultation with ICASA and aims to align with the Codes of Good Practice, addressing challenges multinational companies face regarding local equity ownership, while accelerating universal internet access.

Sofibanque Boosts DRC Banking with Move to OADC Texaf Tier-III Data Center

Sofibanque, a leading financial institution of the DRC, has adopted colocation services at the OADC Texaf – Kinshasa Tier-III Uptime Institute certified data center.

Sofibanque has decided to significantly upgrade and transform its IT systems, thereby improving service and customer experience, by colocating its equipment in a world-class, secure environment. The OADC Texaf – Kinshasa facility, with its 2MW capacity, has set the benchmark as the cornerstone of the DRC's emerging digital ecosystem. It is on track to achieve ISO27001 post-live certification, a first of other ISO Certifications, underscoring its commitment to the highest standards of security, operational excellence and client satisfaction. Such a facility is particularly suited for the demanding requirements of the banking sector and other corporates, which include secure, reliable, scalable and cost-effective infrastructure.

This move underscores Sofibanque's commitment to driving digital transformation in the DRC. A colocation data cener like OADC Texaf – Kinshasa enables banks to modernise their IT operations, bring agility to expand for customer acquisition and growth. By colocating their critical IT systems in a certified facility, financial institutions such as Sofibanque can benefit from enhanced physical security, sustained uptime and compliance with international standards and national regulations, all of which are crucial for supporting the expanding digital economy.

By partnering with OADC Texaf – Kinshasa, Sofibanque strengthens its digital capabilities, reinforcing its leadership in the DRC's banking sector. By leveraging the world-class colocation services at OADC Texaf – Kinshasa, Sofibanque will ensure superior service delivery to its growing customer base while also providing cost savings compared to maintaining in-house data storage and management systems. With all the leading carriers installed in OADC Texaf connectivity ecosystem, Sofibanque has direct access to connectivity services, achieving efficient connectivity in tandem with cost savings.

For OADC Texaf – Kinshasa, this partnership marks a significant milestone, establishing the facility as a critical hub in the financial infrastructure of Central Africa. As more banks follow Sofibanque, OADC Texaf – Kinshasa is set to become a cornerstone of the region's digital transformation, driving financial inclusion and innovation in the region's banking sector.

"This collective shift towards advanced infrastructure will play a critical role in the economic development of the DRC and neighbouring countries, fostering a more inclusive financial system and supporting broader socio-economic progress. We are proud to support Sofibanque in their journey towards digital transformation and look forward to welcoming other local and pan Africa banks," said Mohammed Bouhelal, Managing Director of OADC Texaf Kinshasa.

Henry Wazne, Managing Director and CEO of Sofibanque, added, "Our decision to partner with OADC Texaf Digital – Kinshasa reflects our commitment to offering the best possible service to our customers. The facility's advanced infrastructure will enhance the availability of our services, allowing us to meet the growing demands of the market and support our long-term digital strategy. This partnership is a key step in our journey towards a more powerful and agile IT environment that supports both our customers and the broader financial ecosystem in the DRC."

GSMA Africa Releases Reports to Boost Kenya's Digital Economy and Connectivity

The GSMA— alongside mobile operators, Kenya's Ministry of Information, Communication, and the Digital Economy, and the Communications Authority of Kenya —has launched three reports to accelerate the country's digital transformation. These include the Kenya Digital Economy Report, the Digital Africa Index (DAI), and the Smartphone Affordability Report, which highlight Kenya's digital progress.

Angela Wamola, GSMA's Head of Sub-Saharan Africa, noted that digital technology adoption has fueled economic growth, positioning Kenya as a leader in mobile connectivity and financial services. While 3G and 4G networks now cover nearly the entire population, over 65% of Kenyans remain unconnected to mobile internet.

Wamola emphasized Kenya's potential to attract more foreign investment by advancing digital transformation in key sectors like agriculture, transport, and manufacturing. The reports propose reducing taxes on devices and mobile services, promoting affordability, and creating a pro-investment regulatory environment to unlock further growth.

Namibia's Telecom Sector Set for Disruption as Starlink Targets Market Share

Economic analysts are concerned about the potential disruption Elon Musk's Starlink satellite internet could cause in Namibia's telecom industry. As the Namibian government explores partnerships with Starlink, local players like MTC and Telecom Namibia may face significant competition.

Last month, President Nangolo Mbumba and ICT Minister Emma Theofelus met with Musk in New York to discuss possible Tesla and Starlink investments in Namibia.

Economic analyst Mally Likukela highlighted the risk of market disruption, noting that Starlink's advanced technology and economies of scale could allow it to offer lower-cost services, threatening the market share of local giants.

However, Likukela also sees potential benefits, such as technology transfer and the upskilling of local technicians through collaboration with Starlink.

Josef Kefas Sheehama echoed these concerns but emphasized the broader opportunities Starlink could bring, particularly in improving internet access and reducing the digital divide in rural areas. He cautioned, however, that the arrival of advanced technology could lead to job losses at local providers and stressed the importance of upskilling Namibia's workforce.

Hyperconnected Ecosystems in Africa: Fueling Innovation and Growth

Africa's digital transformation has accelerated in recent years, spurred by the rapid adoption of new technologies, expanding mobile and internet penetration, and increasing innovation. Central to this transformation is the emergence of hyperconnected ecosystems, which are creating unprecedented opportunities for collaboration, innovation, and growth across various sectors.

These ecosystems, characterized by interconnected platforms, services, and devices, are reshaping industries like finance, agriculture, and healthcare, driving economic growth and enhancing Africa's position in the global digital economy.

The Rise of Hyperconnectivity in Africa

Africa's connectivity landscape has evolved dramatically, fueled by investments in digital infrastructure, government initiatives, and private-sector involvement. Telecommunications companies have expanded their networks, with mobile internet penetration in Sub-Saharan Africa reaching 43% by 2023. The increasing affordability of smartphones and data has empowered millions of Africans to access digital services, laying the foundation for a highly interconnected environment.

Hyperconnectivity, however, extends beyond basic internet access. It involves creating ecosystems where digital platforms, devices, and services interact seamlessly. Built on cloud computing, the Internet of Things (IoT) and artificial intelligence (AI) enables businesses, governments, and individuals to collaborate in real-time, regardless of location.

Countries like Kenya, Nigeria, and South Africa have been pioneers in leveraging hyperconnected ecosystems to drive innovation and develop new business models. Kenya's fintech giant, M-PESA, for example, evolved from a mobile money service into a broader ecosystem, encompassing insurance, loans, and savings—all accessible through a single platform. This hyperconnectivity seamlessly integrates financial services into daily life, promoting financial inclusion and fueling economic growth.

Driving Innovation through Hyperconnected Ecosystems

Innovation thrives in hyperconnected ecosystems, as they facilitate the exchange of ideas, resources, and knowledge across industries and borders. In Africa, this has led to the rise of tech hubs and innovation centers,

nurturing new solutions to local and global challenges.

Agritech startups, for instance, are harnessing IoT and data analytics to enhance agricultural productivity. In countries like Ghana and Rwanda, hyperconnected platforms provide farmers with real-time information on weather, crop prices, and pest control, enabling them to make informed decisions and improve yields. This connectivity has the potential to revolutionize agriculture in Africa, increasing food security and reducing dependence on imports.

Companies like Twiga Foods (Kenya) optimize the agricultural supply chain by providing farmers with real-time insights on demand and pricing, while Farmcrowdy (Nigeria) connects small-scale farmers with investors and offers data on weather and crop growth. Zenvus (Nigeria) uses IoT sensors to monitor soil health and optimize irrigation, and Aerobotics (South Africa) provides drone-powered analytics for early disease detection in crops. Hello Tractor (Nigeria) connects farmers with mechanized services through IoT-enabled tractors, while Lori Systems (Kenya) improves agricultural logistics through data-driven solutions.

Healthcare is another sector benefiting from hyperconnected ecosystems. Telemedicine platforms are connecting patients in remote areas with medical professionals in urban centers, addressing the healthcare access gap. These platforms rely on cloud-based systems to store patient data and IoT-enabled devices to monitor vital signs, ensuring doctors can provide accurate diagnoses even from a distance. The COVID-19 pandemic accelerated the adoption of such technologies, underscoring the critical role hyperconnectivity plays in improving healthcare delivery.

Platforms like Vezeeta (Egypt) and Babylon Health (Rwanda) enable patients to connect with doctors through mobile apps, while mPharma (Ghana) combines telemedicine with pharmaceutical distribution for chronic disease management. Helium Health (Nigeria) integrates electronic medical records with telemedicine services, and Kena Health (South Africa) provides affordable virtual consultations with healthcare professionals.

Economic Growth and Job Creation

The impact of hyperconnected ecosystems on Africa's economic growth is profound. By enabling innovation, these ecosystems are driving the creation of new industries and business models, many of which are digitally native. E-commerce, for example, has flourished due to the connectivity provided by mobile phones and digital payment systems, allowing African entrepreneurs to reach customers beyond their local markets. Platforms such as Jumia and Flutterwave not only facilitate cross-border trade but also create jobs and stimulate economic activity in previously underserved areas.

Moreover, hyperconnected ecosystems are attracting significant international investment. Global tech giants like Microsoft, Google, and Amazon have recognized Africa's digital potential and are investing heavily in the region. This influx of capital is helping to build the infrastructure necessary for further digital transformation, including data centers and fiber-optic networks. As a result, African startups are scaling their operations and competing on the global stage.

Challenges to Overcome

Despite the promise of hyperconnected ecosystems, significant challenges remain. Infrastructure gaps, especially in rural areas, pose a major hurdle. While urban centers like Nairobi, Lagos, and Johannesburg are thriving, many parts of Africa still lack reliable internet access and electricity, limiting the reach of digital services.

Cybersecurity is another pressing concern. According to a study conducted by Liquid Intelligent Technologies in 2023, hacking across Africa has seen a significant increase, particularly in South Africa and Kenya, where it almost doubled over the past year from 41% in 2021 to 72% in 2022.

As businesses and individuals become increasingly connected, the risk of cyberattacks grows. To maintain trust in digital platforms, governments and companies must invest in robust cybersecurity frameworks. Cross-border collaboration between countries and industries will be essential for addressing these challenges and ensuring the security of Africa's hyperconnected ecosystems.

Regulatory frameworks also need to keep pace with rapid technological changes. Governments across Africa are working to craft policies that encourage innovation while protecting consumers and ensuring fair competition. Finding the right balance between regulation and fostering innovation will be crucial to sustaining the growth of hyperconnected ecosystems.

African nations are increasingly implementing cybersecurity policies to combat growing cyber threats and protect critical infrastructure. The African Union's Malabo Convention provides a continental framework for data protection and cybercrime governance. Countries like South Africa (National Cybersecurity Policy Framework), Kenya (National Cybersecurity Strategy), and Nigeria (National Cybersecurity Policy and Strategy) have developed comprehensive strategies focusing on securing critical infrastructure, enhancing capacity, and promoting public-private partnerships. Other nations like Ghana, Rwanda, and Mauritius have launched policies to strengthen cybersecurity awareness, legal frameworks, and international cooperation. Egypt has also introduced the Anti-Cyber and Information Technology Crimes law to address cyber offenses and protect data.

The rise of hyperconnected ecosystems in Africa marks a transformative shift, driving innovation, economic growth, and job creation across the continent. By facilitating collaboration across industries and removing geographical barriers, these ecosystems unlock new opportunities for businesses and individuals alike. While challenges remain, Africa's digital transformation is well underway. As hyperconnectivity continues to expand, it will play an increasingly central role in positioning Africa as a global hub for innovation and growth. TR

Ethio Telecom Launches Historic Public Share Sale to Drive Economic Transformation

Ethio Telecom, one of Africa's pioneering telecommunications companies, has announced the public sale of 100 million ordinary shares as part of Ethiopia's ongoing economic reform initiatives. This is the first time in history that the company is offering shares to the public, marking a significant milestone in Ethiopia's efforts to transform its economy and strengthen its capital market.

The Ethiopian government has been undertaking numerous strategic initiatives to modernize key sectors, including telecommunications, finance, and infrastructure. This share sale by Ethio Telecom comes as part of a broader plan to enable the private sector to play a larger role in the economy. It also supports the government's vision to accelerate digital transformation and financial inclusion under its Digital Ethiopia strategy.

Offering 100 Million Shares to the Public
Ethio Telecom, which serves over 79 million subscribers across Ethiopia, has modernized its services and expanded its digital and telecom infrastructure nationwide. By offering 100 million ordinary shares to the public, valued at 300 birr per share, the company seeks to expand its capital base and drive further improvements in service quality and reach.

This share sale allows Ethiopian citizens and investors to purchase shares in one of the country's most significant state-owned enterprises, now transitioning to a share company. The sale process will be carried out via the telebirr SuperApp, with shares available for a minimum investment of 9,900 birr (33 shares) and a maximum of 999,900 birr (3,333 shares). The share sale period is open from October 16, 2024, to January 3, 2025.

Prime Minister Abiy Ahmed's Vision for Ethiopia's Economic Evolution
Speaking at the launch of the share sale, Ethiopian Prime Minister Abiy Ahmed highlighted the importance of this moment in Ethiopia's economic evolution: "Today marks a significant milestone as we launch the sale of Ethio Telecom shares, an essential step in our ongoing journey from political revolution to economic evolution. With 50 million Ethiopians transacting via mobile money, this share offering lays the groundwork for Ethiopia's stock market and provides citizens with an opportunity to own part of one of the nation's leading institutions."

The move underscores the Ethiopian government's commitment to inclusive growth, economic diversification, and the promotion of domestic and foreign investment.

Telecom Egypt Launches High-Speed Internet Hubs in Cairo and Alexandria

Telecom Egypt and Colt have announced a significant strategic partnership to establish two high-speed internet transit nodes in Cairo and Alexandria. These new nodes will be hosted in Telecom Egypt's advanced data centers and leverage its expansive international infrastructure, which spans over 60 countries. Additionally, Colt's extensive IP network will be integrated to provide seamless, high-speed access to the global internet, enhancing the overall connectivity experience.

This collaboration positions both companies to deliver high-performance digital services across Africa, Asia, and the Middle East. By providing a more reliable and faster internet connection, the partnership aims to support businesses in these regions, driving their digital transformation efforts and empowering their growth in an increasingly digital economy.

With over 160 years of experience and a vast submarine cable network, Telecom Egypt has established itself as a leader in delivering advanced technology and reliable infrastructure solutions.

As a key global connectivity hub, Egypt offers unparalleled access to internet transit nodes for African, Asian, and Middle Eastern carriers, supported by 13 submarine cable systems that land on its eastern coast. By 2025, this number is expected to rise to 18, further solidifying Egypt's critical role in global internet connectivity and digital transformation across multiple regions.

Safaricom Expands M-PESA Cross-Border Transfers into Ethiopia

M-PESA Kenya expands its International Money Transfer (IMT) to Ethiopia. Customers will now be able to send money from Kenya to Ethiopia via M-PESA Global.

Safaricom has extended its M-PESA Global service to Ethiopia, allowing customers to make mobile money transactions from Kenya to Ethiopia. Through this expansion, the two companies aim to increase mobile money use and penetration across Ethiopia, boosting local economies as well as creating opportunities for individuals and businesses across the region.

Safaricom Kenya's Chief Financial Services Officer, Esther Waititu said: "This collaboration resonates with our commitment to deliver innovative financial solutions that cater to the evolving needs of our customers. By making cross-border transfers more accessible, efficient and cost effective, we are empowering individuals and businesses across the region."

Customers in M-PESA Kenya can now make mobile money transfers to M-PESA Ethiopia via the M-PESA International Remittance. Through this collaboration, customers in both countries will only require their M-PESA wallets.

Speaking during the signing ceremony, Elsa Muzzolini - Safaricom Ethiopia's Chief Financial Services Officer - stated, "We are thrilled to work with M-PESA Kenya, especially at a time when foreign exchange policy reforms made by the National Bank of Ethiopia (NBE) are encouraging a growing number of Ethiopian diaspora and business owners to embrace digital payments to send money to their loved ones and fund their operations."

"Our M-PESA Ethiopia customers should now be able to receive safe and affordable transfers from M-PESA Kenya thanks to this collaboration, which will further promote the region's adoption of digital payments. We look forward to a successful collaboration," she added.

Vodacom Business Drives the Advancement of Smart Cities in South Africa

In its commitment to digitalizing critical enterprise sectors, Vodacom Business is working with local governments to provide technology solutions to help make South African cities smarter. Announcing the partnership, which forms part of a five-year Transversal Contract with the National Treasury, Vodacom Business showcased the significant role digital solutions can play in enabling municipalities to deliver services efficiently and build an inclusive future.

"We have a proven track record in partnering with the public sector to deliver transformative digital solutions. We aim to use our experience and expertise in understanding government needs to achieve their smart city goals. This includes digitalizing utilities management, healthcare, education and security, which streamline operations, enhance efficiencies and improve the lives of citizens," says Videsha Proothveerajh, Director of Vodacom Business.

Digital solutions can help municipalities manage the consumption and delivery of services, such as water and electricity. Vodacom Business offers a smart utilities management system, which makes use of connected smart meters to provide real-time information on consumption. This can also help to improve accurate billing and revenue collection for residents and has been extended to include fleet management – saving the municipalities costs and enhancing the lifespan, value and efficiency of their assets. To further enhance service delivery, Vodacom Business has also developed and deployed the Citizen Engagement app, which enables two-way communication and collaboration between citizens and municipalities, including logging service requests and tracking their progress.

Technology has been effectively leveraged as a solution for improving critical access to healthcare. Apps, such as the secure, cloud-based Stock Visibility Solution (SVS) by Vodacom Business, can strengthen stock-level monitoring and administration by healthcare facilities to deliver greater efficiency and medication-dispensing responses. For better patient care, AitaHealth is a smartphone-based platform that empowers Community Health Workers (CHWs) to deliver preventative care services to communities on a home-based level. Other digital initiatives from Vodacom Business to support public healthcare delivery include the Computer Aided Dispatch (CAD) system, which allows users to track ambulance requests from the moment a call is logged all the way through to the final delivery of the patients at their destination.

Revolutionizing Telecom Supply Chains in Africa: Innovations and Challenges

Africa's telecom industry is expanding rapidly, driven by an increasing demand for connectivity, mobile services, and digital solutions. Yet, at the core of this progress lies a critical and often underappreciated element—the telecom supply chain. From sourcing equipment to delivering network components, telecom supply chains are undergoing significant changes driven by innovation and evolving market needs. As Africa continues its digital transformation, optimizing telecom supply chains presents both exciting opportunities and formidable challenges.

The Role of Telecom Supply Chains in Africa

Telecom supply chains encompass the end-to-end process of delivering communication services—from sourcing raw materials and manufacturing telecom equipment to logistics and infrastructure deployment. These supply chains include key elements like fiber optics, network components, mobile devices, and data centers. A well-functioning supply chain ensures that operators can expand networks, maintain uninterrupted services, and meet the growing demand for high-speed internet.

In Africa, efficient telecom supply chains are vital for supporting the continent's digital goals. With efforts underway to increase internet penetration, especially in underserved rural regions, the need

for innovative supply chain solutions has become more pronounced. The efficiency and agility of telecom supply chains are crucial for rolling out advanced technologies like 5G, fiber networks, and the Internet of Things (IoT).

Innovations Shaping Telecom Supply Chains

1. **Digitalization and Data-Driven Management**

Digitalization is transforming how telecom supply chains operate. New technologies like artificial intelligence (AI), data analytics, and blockchain are enabling operators to streamline operations and optimize logistics. AI-powered systems, for example, can predict demand, enhance inventory management, and prevent bottlenecks. With access to real-time data, telecom companies can respond faster to market changes and minimize delays.

Blockchain is also emerging as a powerful tool in enhancing supply chain transparency and security. By recording transactions on an immutable ledger, blockchain improves accountability and combats fraud in procurement processes—especially critical in markets with limited infrastructure and high regulatory hurdles.

2. **Automation and Robotics**

Automation is revolutionizing telecom supply chains by improving the speed and accuracy of operations. Warehouses are increasingly using robots to handle inventory, packaging, and shipping tasks. Automated systems can respond quickly to fluctuations in demand, ensuring equipment is readily available where and when needed. In some regions, drones are being tested for last-mile delivery of essential telecom components to remote areas, bypassing infrastructure challenges such as poor road conditions.

Automation also reduces dependency on manual labor, minimizes errors, and speeds up the deployment of infrastructure, which is essential for the rapid rollout of telecom services across Africa.

3. **Sustainability and Green Logistics**

Sustainability is becoming a key focus for telecom operators, and this extends to supply chains. As environmental concerns grow, operators are adopting eco-friendly practices such as using electric vehicles for logistics and relying on renewable energy to power warehouses and data centers. Recycling and repurposing old telecom equipment have also gained traction, with circular economy models being implemented to reduce e-waste and extend the lifecycle of telecom hardware.

This shift toward sustainability not only helps protect the environment but also positions telecom operators as socially responsible entities, a growing concern for investors and consumers alike.

Challenges Facing African Telecom Supply Chains

Despite the potential benefits of innovation, several challenges continue to hamper the efficiency of telecom supply chains across Africa.

1. **Infrastructure Deficiencies**

One of the most pressing issues facing telecom supply chains in Africa is poor infrastructure. Inadequate roads, unreliable power supplies, and limited access to key ports can significantly delay the deployment of telecom networks. These challenges are particularly pronounced in rural areas, where the demand for connectivity is growing, but the logistical support needed to deliver equipment and set up infrastructure is lacking.

2. **Regulatory Hurdles and Trade Barriers**

Telecom supply chains are also affected by complex regulatory environments. Inconsistent customs regulations, varying policies across different countries, and bureaucratic delays can disrupt the movement of goods and equipment. Navigating these regulatory frameworks can be time-consuming and costly for telecom operators. Harmonizing trade policies and simplifying customs procedures would greatly enhance the efficiency of supply chains across the continent.

3. **Cybersecurity Risks**

As supply chains become increasingly digitalized, they face heightened risks of cyberattacks. Disruptions to supply chain systems or the theft of sensitive data could have severe consequences for telecom operators. In Africa, where cybersecurity infrastructure is still developing, operators must invest in powerful cybersecurity measures to safeguard their digitalized supply chains from emerging threats.

4. **Skills Gap**

The successful implementation of innovative supply chain technologies requires a skilled workforce. However, there is a shortage of workers with expertise in operating digital systems, automation technologies, and AI-powered supply chain platforms. To bridge this gap, African countries need to invest in training programs and educational initiatives that prepare the workforce for the demands of modern telecom supply chains.

The Path Forward

Africa's telecom supply chains are undergoing a period of transformation, driven by digital innovation, automation, and sustainable practices. These advancements promise to improve efficiency, reduce costs, and support the rollout of cutting-edge telecom technologies. However, overcoming infrastructure gaps, regulatory hurdles, cybersecurity risks, and workforce shortages is critical to realizing the full potential of these innovations.

Collaboration between governments, telecom operators, and industry stakeholders will be key to addressing these challenges. By working together, they can build more agile, resilient, and sustainable telecom supply chains that support Africa's continued digital transformation and drive long-term economic growth across the continent. TR

A2P SMS Fraud: A Rising Threat to Telecom Security in Burkina Faso, Libya, and Tanzania

In recent years, Application-to-Person (A2P) SMS fraud has become a major concern for the telecommunications industry, especially in Burkina Faso, Libya, and Tanzania. This type of fraud exploits vulnerabilities in mobile networks, resulting in significant financial losses for telecom operators and compromising consumer security and privacy. As the digital landscape evolves, it is essential for stakeholders to grasp the intricacies of A2P SMS fraud and the necessary measures to combat it.

Understanding A2P SMS Fraud

A2P SMS refers to the process of sending text messages from an application to a mobile phone user. While legitimate businesses utilize A2P messaging for various purposes, such as marketing and two-factor authentication, cybercriminals have also harnessed this technology to execute fraudulent schemes. In A2P SMS fraud, attackers typically send unsolicited messages that appear to originate from reputable companies or services. These messages often contain links to phishing websites, fake promotions, or malicious downloads designed to extract sensitive information from unsuspecting users.

The Growing Threat in Burkina Faso

Burkina Faso, a landlocked country in West Africa, has witnessed a

sharp increase in A2P SMS fraud incidents in recent years. The rise of mobile penetration in the country, coupled with a lack of effective regulatory frameworks, has created an environment ripe for exploitation. Fraudsters often target vulnerable populations, including small business owners and individuals seeking financial assistance or job opportunities.

Local telecom operators have reported significant losses due to A2P SMS fraud. In response, the government and regulatory bodies have begun implementing measures to mitigate the threat. The Burkina Faso National Telecommunications Regulatory Authority (ARCEP) has initiated awareness campaigns to educate consumers about the risks associated with unsolicited messages and the importance of safeguarding personal information.

Despite these efforts, challenges remain. The rapid growth of mobile money services in Burkina Faso has also made the sector a prime target for fraudsters. As more people use their mobile devices for transactions, the risk of falling victim to A2P SMS fraud increases, making it imperative for telecom operators to adopt advanced security measures.

Libya's Vulnerability to A2P SMS Fraud

In Libya, the political instability and fragmented telecommunications infrastructure have exacerbated the problem of A2P SMS fraud. The country's ongoing conflicts have created opportunities for cybercriminals to exploit gaps in security, with many residents relying on mobile communication for essential services. As the Libyan economy struggles, scammers are capitalizing on the desperate circumstances of many citizens, luring them with promises of financial aid or employment opportunities through fraudulent A2P messages.

Telecom companies in Libya face immense pressure to enhance their security protocols and protect consumers from these threats. Some operators have begun implementing filtering systems to identify and block fraudulent messages, but the rapidly evolving tactics of cybercriminals pose a significant challenge. Collaboration between the government, telecom providers, and international cybersecurity organizations is essential to develop comprehensive strategies to combat A2P SMS fraud effectively.

Tanzania's Fight Against A2P SMS Fraud

In Tanzania, the telecommunications landscape is similarly threatened by the rise of A2P SMS fraud. With a growing mobile subscriber base and increasing reliance on digital services, the potential for fraudsters to exploit vulnerabilities has surged. Tanzanian authorities have reported a rise in complaints related to fraudulent messages, leading to concerns about consumer safety and trust in mobile services.

To combat this issue, the Tanzanian Communications Regulatory Authority (TCRA) has taken steps to enhance regulatory oversight and promote consumer education initiatives. These efforts aim to inform users about the signs of A2P SMS fraud and the importance of verifying the authenticity of messages before taking action.

Telecom operators in Tanzania have also begun investing in advanced fraud detection technologies to identify and prevent A2P SMS fraud before it reaches consumers. By implementing machine learning algorithms and real-time monitoring systems, these companies hope to reduce the number of fraudulent messages that slip through the cracks.

The Path Forward: Collaboration and Awareness

Addressing the rising threat of A2P SMS fraud in Burkina Faso, Libya, and Tanzania requires a multifaceted approach. Telecom operators, regulatory bodies, and consumers must work together to combat this issue effectively. Here are some critical strategies for moving forward:

1. **Enhanced Regulation:** Governments need to establish and enforce stricter regulations around A2P messaging, including penalties for companies that fail to protect consumers from fraud.

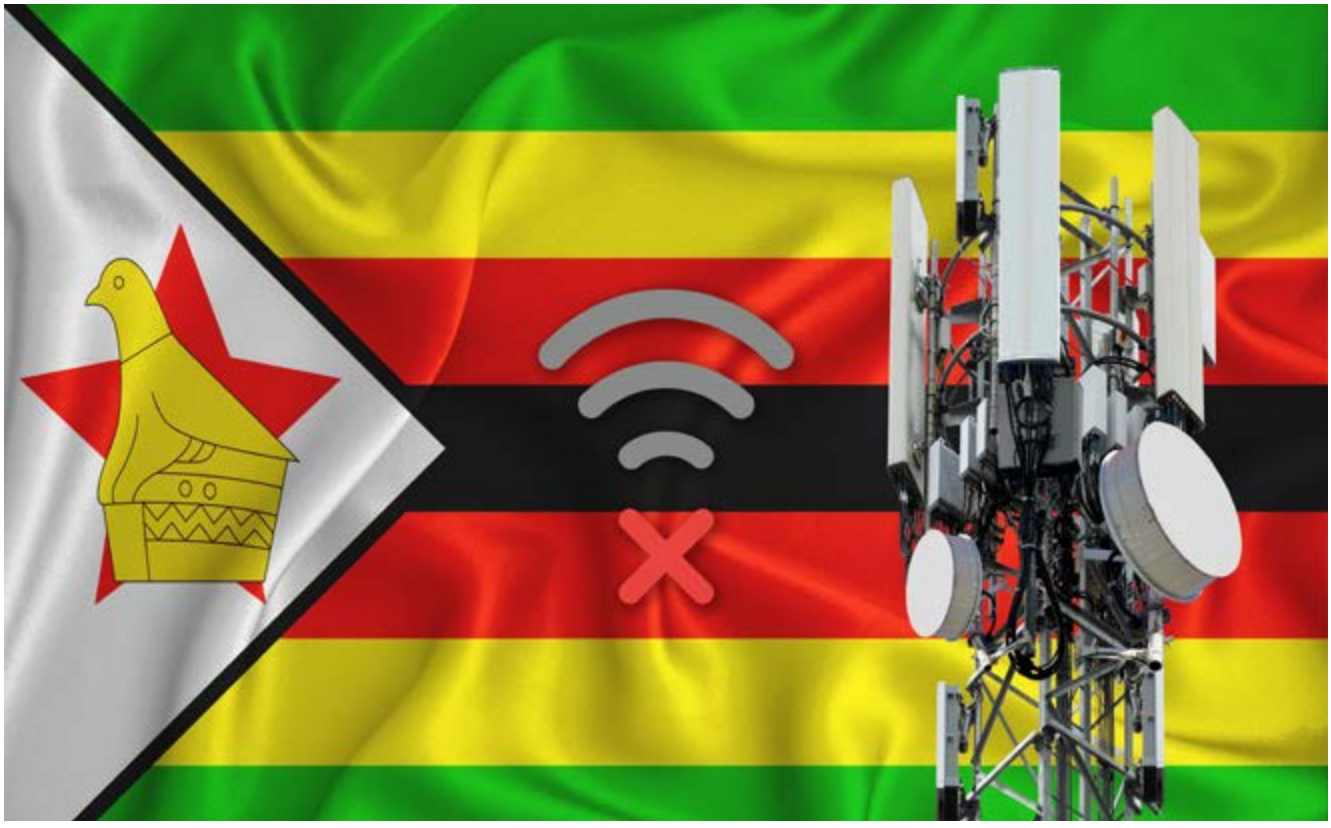
2. **Consumer Education:** Increasing awareness among consumers about A2P SMS fraud is essential. Telecom operators and regulatory authorities should launch educational campaigns to inform users about the risks and how to identify fraudulent messages.

3. **Investment in Technology:** Telecom companies should invest in advanced security measures, including machine learning and artificial intelligence, to detect and prevent fraudulent messages in real time.

4. **Collaboration:** Building partnerships between telecom operators, government agencies, and international cybersecurity organizations can facilitate knowledge sharing and the development of effective strategies to combat A2P SMS fraud.

5. **Reporting Mechanisms:** Establishing clear reporting mechanisms for consumers to report suspected fraud can help telecom operators and regulatory bodies respond more effectively to emerging threats.

A2P SMS fraud presents a rising threat to telecom security in Burkina Faso, Libya, and Tanzania. As mobile communication becomes increasingly integral to daily life, the risks associated with fraudulent messaging grow. By prioritizing collaboration, regulation, and consumer education, stakeholders can work together to mitigate the impact of A2P SMS fraud and ensure a safer telecommunications environment for all users. TR



Zimbabwe's Tough Stance: Heavy Fines to Tackle Poor Telecom Services

In a bold move to enhance the quality of telecommunications in Zimbabwe, the government has implemented stringent regulations imposing heavy fines on telecom service providers that fail to meet the required standards. This initiative reflects growing frustration among citizens regarding the declining quality of telecom services and the urgent need for improvement.

Rising Tide of Dissatisfaction

Over the past few years, Zimbabwean telecom consumers have increasingly voiced their dissatisfaction with the services offered by major providers. Complaints about dropped calls, poor internet connectivity, and slow data speeds have become commonplace. Recent surveys indicate that a significant percentage of users express frustration with their inability to access reliable communication channels, hindering both personal and professional interactions.

The government's decision to impose heavy fines comes in response to mounting pressure from consumers demanding better services. The Zimbabwean Communications Regulatory Authority (ZICTA) has been vocal in addressing these issues, reaffirming its commitment to ensuring that consumers receive the quality of service they deserve. The new regulations serve as a stern warning to telecom companies that negligence will no longer be tolerated.

> The new regulations have sparked a wave of investment as companies scramble to upgrade their networks and improve customer experiences

The New Regulatory Framework
Under the new framework, telecom providers will face substantial financial penalties if they fail to adhere to specified service quality standards. Fines can range from thousands to millions of Zimbabwean dollars, depending on the severity and frequency of infractions. This regulatory overhaul aims to ensure that companies prioritize service delivery and invest in infrastructure improvements.

Impacts on Telecom Providers
The introduction of heavy fines has sent shockwaves through Zimbabwe's telecom industry. Service providers are now under significant pressure to quickly enhance their infrastructure and service delivery to avoid incurring penalties. The new regulations have sparked a wave of investment as companies scramble to upgrade their networks and improve customer experiences.

TelOne, one of Zimbabwe's leading telecom companies, has already announced a significant investment plan aimed at expanding its fiber-optic network and enhancing internet connectivity in underserved areas. Similarly, Econet Wireless, the largest mobile network operator in the country, has pledged to increase its investment in infrastructure to address customer complaints and improve service quality.

However, some industry analysts express concern that the heavy fines could strain the financial resources of smaller telecom operators, potentially leading to service disruptions or even company closures. These smaller players often struggle to compete with larger providers and may find it challenging to meet the new standards set by ZICTA.

Industry Perspectives
The response from the telecom industry has been one of cautious optimism, albeit with concerns about the implications of heavy fines on operational sustainability. Executives emphasize that while the intention behind the regulations is commendable, a balanced approach is necessary to allow for growth and investment in the sector.

Some industry leaders argue that the fines should be accompanied by supportive measures that help companies enhance their service capabilities without jeopardizing their financial stability. They advocate for a collaborative approach between regulators and service providers to develop solutions that benefit both the industry and consumers.

Future Prospects
The success of the government's tough stance will ultimately depend on its enforcement and the willingness of telecom providers to comply with the new regulations. The next few months will be critical as companies work to enhance their services while navigating the challenges posed by the new financial penalties.

As Zimbabwe's economy continues to grapple with various challenges, the improvement of the telecom sector could play a crucial role in supporting economic growth and fostering innovation. Reliable communication services are essential for businesses, education, and social interactions, making it imperative for telecom providers to rise to the occasion.

In conclusion, Zimbabwe's decision to impose heavy fines on telecom service providers represents a significant step toward improving the quality of telecommunications in the country. While concerns persist regarding the impact on smaller operators and overall industry sustainability, the overall goal remains clear: to create a more reliable and efficient telecom landscape that meets the needs of all Zimbabweans. The coming months will reveal whether this bold approach will lead to the desired transformation or if additional measures will be needed to achieve lasting change in the telecom sector. TR

5G Standalone: Overcoming Barriers to Rapid Adoption

In recent years, 5G technology has emerged as a critical driver of global digital transformation, providing unmatched speed, ultra-low latency, and enhanced connectivity to fuel the next wave of technological advancements. While many countries have made significant progress in rolling out 5G networks, much of the deployment has focused on non-standalone (NSA) 5G networks, which depend on existing 4G infrastructure. However, 5G standalone (5G SA), with its fully independent 5G core, promises to unlock the full potential of next-generation connectivity. Despite its advantages, the rapid adoption of 5G standalone faces a number of barriers that need to be addressed.

The Next Frontier in Wireless Network Evolution

5G standalone (SA) represents a next-generation network architecture that functions independently of legacy 4G systems, unlike 5G NSA, which relies on 4G LTE as a foundational layer. 5G SA incorporates both a 5G core network and a 5G radio access network (RAN), built entirely on 5G-native infrastructure. This architecture unlocks advanced capabilities such as network slicing, ultra-reliable low-latency communication (URLLC), and massive machine-type communication (mMTC), which are critical for supporting high-demand applications like autonomous vehicles, smart cities, industrial automation, and enhanced mobile broadband (eMBB).

5G SA isn't a mere extension of existing networks; it's a transformative overhaul in wireless network design, operation, and optimization. It offers significant benefits, including greater scalability, flexibility in network management, improved energy efficiency, and heightened security through advanced protocols. However, realizing the full potential of 5G standalone comes with technical and financial hurdles, such as developing a robust 5G ecosystem, ensuring device compatibility, and overcoming deployment challenges, which are currently slowing its widespread adoption.

The current state of 5G SA in Africa is in its early stages, with most countries still relying heavily on 5G NSA networks, which use 4G infrastructure to deliver 5G services. Although a few telecom operators have begun exploring and rolling out 5G SA, widespread deployment faces several challenges across the continent. Here's a look at the status and factors influencing 5G SA development in Africa:

Limited Rollout of 5G Standalone

- **South Africa** is one of the most advanced countries in terms of 5G deployment, with operators like Vodacom and MTN leading the charge. However, much of the 5G network infrastructure in South Africa is still based on NSA models. Plans for 5G SA are underway, but the transition has been slow due to the substantial infrastructure upgrades required.
- In Kenya, Safaricom has also launched 5G services, though these are largely NSA-based. The company has stated its long-term ambition to move towards 5G SA, but like many other African countries, Kenya is facing high costs and infrastructure limitations.
- Nigeria, a key player in Africa's telecommunications market, has begun trials for 5G services with operators like MTN and Airtel. However, similar to other markets, the focus has primarily been on 5G NSA.

Barriers to 5G Standalone Adoption

Despite its promise, several challenges are slowing the global adoption of 5G standalone:

1. **High Infrastructure Investment:** The deployment of 5G SA requires major infrastructure upgrades. Unlike 5G NSA, which can leverage existing 4G infrastructure, 5G SA requires a complete overhaul, including new base stations, backhaul, and core networks. For many operators, especially in developing markets, the costs are prohibitive. Even in advanced markets, operators are cautious about committing large sums without a clear return on investment (ROI).
2. **High Deployment Costs:** Beyond infrastructure, the overall cost of rolling out 5G SA includes software upgrades, spectrum licenses, and operational adjustments. These factors raise the financial barrier, prompting many operators to stick with non-standalone networks for the time being.
3. **Regulatory Challenges:** The global regulatory environment remains a significant barrier. In many regions, spectrum allocation is complicated, and regulations regarding 5G-specific features like network slicing and privacy protocols are either unclear or non-existent. Without harmonized regulations, operators face uncertainty, hindering large-scale deployments.
4. **Lack of Immediate Use Cases:** While 5G SA enables advanced features like low latency and network slicing, these benefits are often unnecessary for many of today's applications. Use cases like autonomous vehicles and advanced industrial automation are still in their early stages, reducing demand for 5G SA capabilities in the short term. This delay dampens operators' enthusiasm for investing in full-scale deployments.
5. **Limited Device Compatibility:** Not all devices currently on the market are compatible with 5G SA networks. While many smartphones support 5G NSA, few are designed to take advantage of 5G's advanced capabilities. This lack of compatibility slows down the adoption of the technology, as customers cannot fully experience the benefits of 5G SA.
6. **Operator Hesitance:** Given the financial risks and the lack of compelling immediate use cases, operators are hesitant to transition to 5G SA. Many prefer to continue leveraging 5G NSA until there's clearer evidence of a substantial ROI for 5G SA.

Overcoming Barriers to 5G SA Adoption

The shift to 5G SA is vital for realizing the full potential of next-generation networks, offering unprecedented speed, low latency, and support for a massive number of devices. However, the transition to 5G SA has been slow due to substantial obstacles, including high infrastructure costs, regulatory challenges, and limited device compatibility. To overcome these hurdles and accelerate 5G SA deployment, several strategies can be employed:

Governments play a crucial role in facilitating the deployment of 5G SA. They can expedite the process by streamlining complex regulatory

frameworks, simplifying approval processes, and ensuring efficient allocation of spectrum. Spectrum is a critical resource for 5G networks, and quicker, more flexible distribution will allow operators to deploy 5G SA more effectively. Additionally, financial incentives such as grants, tax breaks, or subsidies could help reduce the financial burden on telecom companies, encouraging faster network rollouts. Public-private partnerships (PPPs) represent another avenue for exploration. Governments and private entities can work together on pilot projects that showcase 5G's capabilities, such as smart city applications, remote healthcare solutions, or advanced industrial automation. These partnerships can serve as innovation hubs that enhance 5G SA's potential across multiple sectors.

The South African government has been proactive in auctioning 5G spectrum and encouraging private-public partnerships. The Independent Communications Authority of South Africa (ICASA) allocated 5G spectrum in 2022, enabling operators like MTN and Vodacom to roll out their 5G networks. The Kenyan government, through the Communications Authority of Kenya (CA), is facilitating the deployment of 5G by releasing spectrum and encouraging investment in infrastructure. The Nigerian Communications Commission (NCC) auctioned 5G spectrum in 2021 and continues to work with telecom operators like MTN and Mafab Communications to deploy 5G services across the country.

Telecom operators must adopt new business models to justify the significant investment required for 5G SA infrastructure. One approach is partnering with enterprises to create industry-specific solutions that leverage 5G's unique capabilities. For instance, private 5G networks tailored for sectors like manufacturing, logistics, and public safety offer new revenue streams. These networks can enable real-time monitoring in factories, enhance the efficiency of supply chains, or improve emergency response times through low-latency communication. In addition to offering new services, operators can explore subscription-based models where businesses pay for dedicated network slices customized for their specific needs. By aligning business strategies with 5G applications that solve industry problems, operators can increase adoption and demonstrate tangible value.

African telecom companies like MTN, Vodacom, Safaricom, and Airtel are adopting new business models by partnering with enterprises to implement industry-specific 5G SA solutions. MTN South Africa's "5G in Mining" enhances safety and automation in mining, while Vodacom's "Connected Farmer" project uses 5G to optimize agriculture through IoT sensors and data analytics. Safaricom Kenya's "5G for Smart Manufacturing" focuses on improving production processes with 5G-powered automation, and Airtel Nigeria's "5G Telemedicine" enables remote healthcare services, improving access in rural areas.

A gradual approach to rolling out 5G SA can help operators manage the financial and operational challenges of full-scale deployment. Instead of a nation-wide launch, telecom companies can initially deploy 5G SA in high-demand areas or for targeted applications. For example, urban centers with high network congestion or industries that require ultra-low latency—such as autonomous vehicles or real-time analytics in healthcare—could benefit from early access to 5G SA. This phased approach allows operators to refine their strategies, address technical issues, and better understand customer needs prior to broader deployment. Additionally, early successes in specific markets can help build investor confidence and encourage further investment in 5G SA.

The success of 5G SA depends not only on network infrastructure but also on the development of a robust ecosystem of devices and applications. Collaboration between telecom operators, device manufacturers, and software developers is essential to ensure that devices—ranging from smartphones to IoT sensors—are compatible with 5G SA. Currently, many devices are designed to work on 5G NSA networks, limiting the capabilities that can be realized through 5G SA. By working together, stakeholders can develop and market devices that support 5G SA's advanced features, such as network slicing and ultra-reliable low-latency communication. A well-integrated ecosystem will accelerate consumer adoption, as users will be able to experience the full benefits of 5G SA through a variety of compatible devices and applications.

Educating both consumers and businesses about the benefits of 5G SA is critical for driving demand. Many industries are still unaware of the transformative potential 5G SA holds for their operations. For instance, businesses in manufacturing, healthcare, or logistics may not fully grasp how 5G SA can enable real-time data analytics, automate processes, or enhance remote work capabilities. Telecom operators need to clearly communicate how 5G SA offers significant improvements over 5G NSA, such as greater scalability, lower latency, and enhanced security. Demonstrating real-world use cases where 5G SA improves efficiency, reduces costs, or enables new services will help build trust and interest. Additionally, consumer campaigns showcasing how 5G SA can enhance everyday experiences, such as augmented reality, ultra-HD video streaming, or advanced gaming, will further boost demand and justify investment in standalone networks.

5G SA offers the promise of a fully connected future, where low latency, massive IoT connectivity, and advanced applications are the norm. However, widespread adoption will require overcoming significant challenges, from high costs and regulatory hurdles to the lack of compelling short-term use cases. By focusing on collaboration, innovative business models, and ecosystem development, the industry can gradually break down these barriers, unlocking the full potential of 5G SA and revolutionizing global connectivity in the years to come. TR

Ericsson and Nigerian Government Partner to Drive 5G Innovation and Digital Transformation

Ericsson's Nigerian unit has signed a memorandum of understanding (MoU) with the Nigerian government to establish a cooperative framework for the development, deployment, and innovation of 5G technology.

Through this agreement, Ericsson Nigeria and the government will explore how 5G can be leveraged to support the country's digital transformation, enhance economic growth, and improve public services. The MoU outlines goals such as knowledge exchange in the tech sector, capacity building, the establishment of innovation hubs and tech incubators, and efforts to boost digital literacy and skills development in Nigeria.

The MoU was signed during a visit by a Nigerian government delegation to Ericsson's global headquarters in Stockholm. The delegation, led by Vice President Kashim Shettima, included Foreign Minister Yusuf Maitama Tuggar, Communications, Innovation and Digital Economy Minister Dr. Bosun Tijani, regional state leaders, and senior officials from Nigerian ICT and communications organizations.

Patrick Johansson, head of Ericsson Middle East and Africa, expressed enthusiasm for the partnership, stating, "We look forward to working closely with the Nigerian government to harness the potential of 5G for businesses, citizens, and the nation's digital competitiveness."

Nokia Unveils Q3 2024 Interim Report

Nokia, a global leader in technological innovation, has revealed a 22% increase in net profit, amounting to EUR 358 million (USD 389 million) amid its 8% sales decline, according to its Q3 Interim Report for 2024.

This marks a significant improvement in the company's gross margin from last year's net profit of EUR 293 million, driven by a better product and regional mix, and effective product cost reduction.

Nokia's Q3 2024 financial report also indicated a decline in net sales amounting to EUR 4.326 billion (USD 4.7 billion), largely attributed to a drop in mobile network sales, particularly in India, and the impact of divestment in its cloud and network services.

Reflecting on Nokia's performance in the third quarter, Pekka Lundmark, the company's President and CEO, highlighted the company's return to net sales growth in the network infrastructure segment. He noted that the fixed network segment reached 9% in constant currency and the IP networks segment reached 6%.

"I am optimistic we are now turning the corner in many parts of our business, even if some continue to experience market weakness," the Nokia CEO stated, conveying his optimism.

Nokia's Risk Factors

Nokia's interim report outlined several risk factors and uncertainties, including competitive intensity, changes in customer network investments, disturbances in the global supply chain, the impact of inflation, and the competitiveness of its product roadmaps. Geopolitical conflicts, economic impacts, and industry developments also pose risks.

In addition, Nokia's ability to meet sustainability and other environmental, social, and governance (ESG) targets, including greenhouse gas (GHG) emissions, appears uncertain.

Other risk factors and uncertainties include concerns regarding product and regional mix, brand and technology licensing, costs for intellectual property rights protection, the timing of completions and the acceptance of certain projects, and the uncertainty in forecasting long-term income tax expenses and cash outflows.

Q4 2024 Expectations

Lundmark emphasized that Nokia anticipates significant growth acceleration during Q4 in the network infrastructure segment. In the mobile networks segment, the Finnish company remains assertive in its market position to improve gross margin despite the challenges it is facing in terms of market dynamics.

Touching on Nokia's performance in the cloud and network services segment, Lundmark underscored the company's remarkable progress in 5G Core, network automation, cloudification, and network application programming interfaces (APIs).

Huawei Egypt Debuts World's First 25 Gbps E-Band Microwave Link

Huawei Egypt, in collaboration with Vodafone Egypt, is excited to announce the successful deployment of the world's first commercial 25 Gbps microwave link in the E-band spectrum. This pioneering achievement demonstrates Huawei's commitment to advancing next-generation network solutions and highlights Egypt's leadership in innovative telecom technologies across the Middle East and Africa.

The state-of-the-art microwave link, operating in the E-band (80 GHz), delivers unprecedented capacity and performance, allowing the transmission of data at 25 Gbps over long distances. This milestone strengthens Egypt's position as a hub for ultra-high-speed connectivity and underpins the future of mobile broadband services, supporting the digital transformation of both businesses and consumers.

Revolutionizing Connectivity with Vodafone Egypt

As part of the strategic partnership with Vodafone Egypt, this 25 Gbps microwave link will enable the delivery of high-demand applications such as 5G, cloud computing, and the Internet of Things (IoT). The solution ensures faster, more reliable internet access and supports the evolving needs of both urban and sub-urban environments.

"Our collaboration with Vodafone Egypt is a testament to our shared vision of driving technological innovation and providing robust, future-proof digital infrastructure," said Louis, CEO of carrier business at Huawei Egypt. "This breakthrough further empowers Egypt's digital ecosystem and accelerates the growth of mobile broadband services across the nation."

Ericsson's Q3 Results Showcase Significant Margin Expansion and Key Strategic Alliances

Ericsson's Q3 2024 report showcases major advancements in strategic and operational priorities, including growth in programmable networks and mobile network contract wins across multiple markets. A notable development was the establishment of a joint venture with leading mobile network operators to secure a global supply of Network APIs. Additionally, Ericsson signed further 5G patent licensing agreements, with projected intellectual property rights (IPR) revenues expected to reach at least SEK 13 billion in 2024.

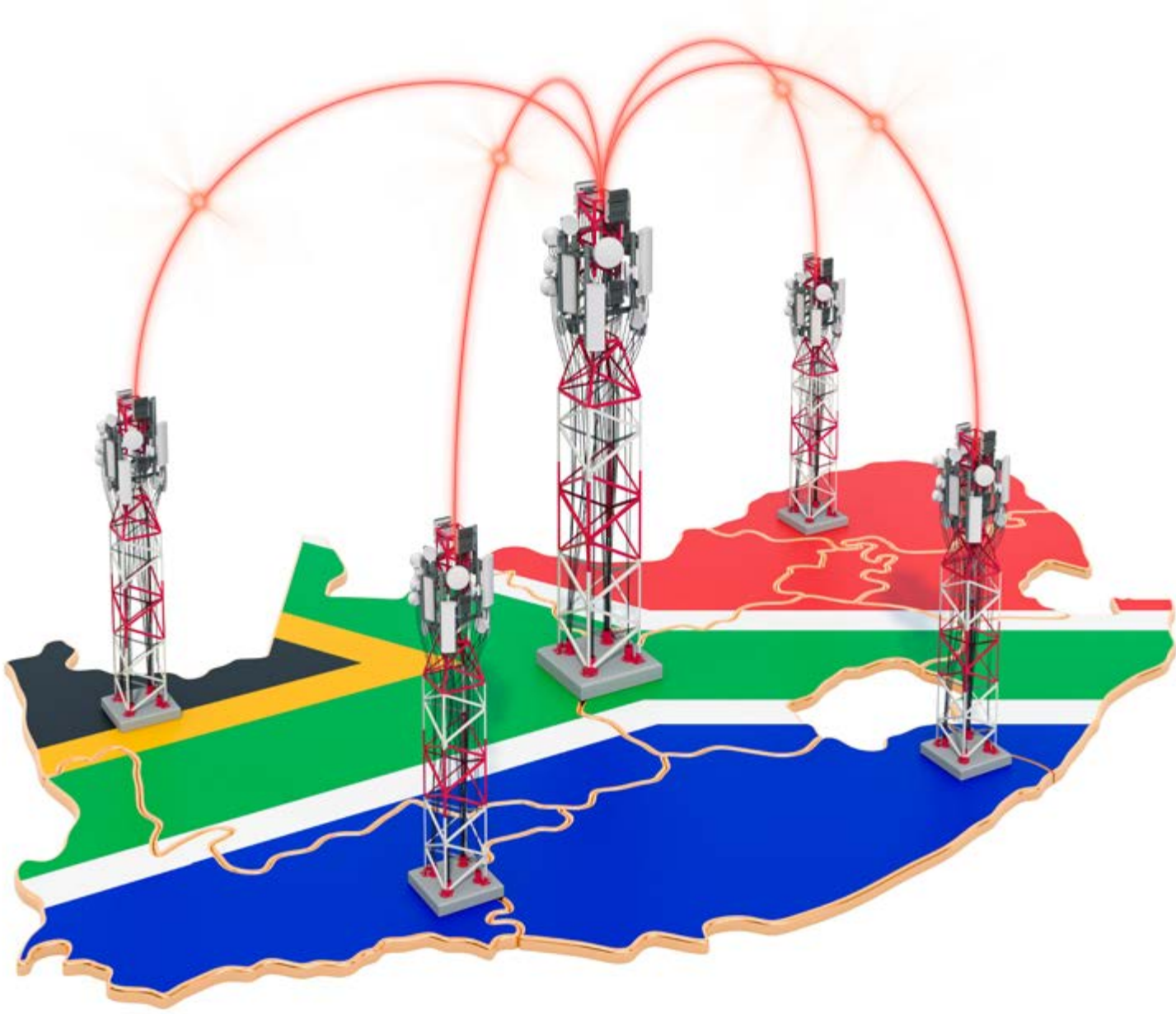
Financially, Ericsson reported a slight year-over-year sales decline of 1%, totaling SEK 61.8 billion, despite a robust 55% increase in North America. Adjusted gross income rose to SEK 28.6 billion, supported by a significant increase in Networks segment gross margin to 48.7%. The reported gross margin improved to 45.6%, reflecting effective cost management and a favorable market mix.

The adjusted EBITA reached SEK 7.8 billion, with a 12.6% margin, benefiting from cost reduction initiatives. Net income improved to SEK 3.9 billion, compared to a loss of SEK 30.5 billion in the previous year, with diluted earnings per share (EPS) at SEK 1.14. Free cash flow before mergers and acquisitions was strong at SEK 12.9 billion, highlighting effective inventory management.

Börje Ekholm, President and CEO, commented: "Q3 marks a period of intense focus on executing our strategic plan. We are seeing increasing customer momentum around programmable networks that deliver differentiated performance, and expect further traction, supported by the joint venture we've announced with 12 of the world's largest telecom operators. This JV will aggregate network APIs, accelerating commercialization and creating new opportunities for network monetization.

We're seeing signs of market stabilization, particularly in North America, which, as an early adopter market, is returning to growth. While market conditions are largely determined by our customers, we are committed to operational excellence regardless of external factors. Our Q3 results highlight our progress, with strong gross margin expansion and consistent free cash flow, driven by our commercial discipline and operational efficiency.

Looking ahead to Q4, we expect our Networks sales to stabilize year-on-year, supported by continued growth in North America. However, we anticipate near-term sales pressure in our Enterprise segment as we focus on profitable areas. To improve performance, we launched a new private 5G enterprise product portfolio in Q3, which remains a top priority for us."



Geopolitical Tensions Shaping Africa's Telecom Infrastructure Landscape

Africa's telecom infrastructure is undergoing rapid transformation as the continent strives to bridge the digital divide, improve connectivity, and foster economic growth. As mobile and internet penetration rates rise, Africa is becoming a dynamic hub for digital innovation. However, the development of this critical infrastructure involves navigating a complex landscape of partnerships with global telecom providers and technology companies.

China's Leading Role in Africa's Telecom Development

One of the most significant influences on Africa's telecom growth has been the involvement of Chinese companies like Huawei and ZTE. These companies have played a pivotal role in helping many African nations establish and expand their telecommunications networks. Offering advanced technology and cost-effective solutions, China has become a key partner for countries looking to accelerate their digital transformation.

Huawei, in particular, has been instrumental in rolling out 4G and 5G networks, helping nations build the backbone for faster internet connectivity and broader mobile access. China's ability to provide not only technology but also financing has made it an attractive partner for African governments looking for scalable and affordable telecom solutions.

Diversifying Telecom Partnerships

While China has been a dominant player, Africa is keen to diversify its telecom partnerships. Countries across the continent are working with a variety of international players to meet their specific needs. American, European, and local African companies are all contributing to the development of infrastructure, providing competition and driving innovation.

African countries recognize that diversifying their partnerships allows for greater flexibility in terms of technology choices, pricing, and service delivery. By engaging multiple global telecom companies, African governments can ensure that they are getting the best deals while also fostering competitive markets that benefit consumers.

The Rise of Local Telecom Innovation

Africa's telecom infrastructure development is not solely dependent on foreign partners. Local telecom providers are stepping up to play a significant role in shaping the continent's digital future. Companies like MTN, Safaricom, and Airtel Africa are leading the charge in expanding mobile coverage and introducing innovative digital services that cater to the unique needs of African populations.

These companies are not only expanding coverage but also investing in value-added services such as mobile money, fintech solutions, and digital education platforms. Mobile money, in particular, has revolutionized the financial landscape in Africa, with services like M-PESA leading the way in providing millions of unbanked individuals access to financial services.

Government Initiatives and Infrastructure Investments

In addition to partnerships with global telecom players, African governments are also taking an active role in driving telecom infrastructure growth. Initiatives aimed at expanding broadband access, improving regulatory frameworks, and promoting digital inclusion are being implemented across the continent.

Governments are investing in both physical infrastructure, such as fiber optic networks, and digital services to create a more connected population. Public-private partnerships are playing a critical role in financing large-scale infrastructure projects, and international development organizations are supporting these efforts with funding and technical expertise.

Building a Sustainable Digital Future

As Africa's telecom sector continues to grow, the focus is also shifting towards sustainability. Governments and telecom companies alike are exploring ways to build environmentally friendly networks, reduce carbon emissions, and improve energy efficiency. Solar-powered mobile towers and sustainable energy solutions are being deployed to ensure that telecom growth aligns with the continent's broader sustainability goals.

Moreover, telecom companies are increasingly aware of the importance of cybersecurity and data privacy. As digital infrastructure expands, the need for secure and resilient networks becomes even more pressing. Many African nations are adopting international best practices in cybersecurity and data protection to safeguard their digital assets and ensure that users can trust the infrastructure being built.

Africa's telecom infrastructure is at an exciting juncture, with tremendous opportunities for growth and innovation. The continent's telecom landscape is being shaped by a mix of global partnerships, local innovation, and government initiatives. As African nations continue to expand and modernize their networks, they are positioning themselves to unlock new economic opportunities, empower citizens through digital services, and drive sustainable development.

The future of Africa's telecom industry will be defined by its ability to harness these partnerships and innovations, ensuring that the continent remains at the forefront of global digital transformation. As connectivity increases and infrastructure develops, Africa stands poised to become a major player in the global digital economy. TR

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Inclusive AI Governance in Africa: Bridging North and South for Responsible AI Development

As Artificial Intelligence (AI) continues to transform industries, economies, and societies, the need for effective governance has become more critical. In Africa, where the potential of AI to drive economic development is significant, it is essential that AI technologies are adopted in a manner that is ethical, inclusive, and sustainable. African countries face unique challenges and opportunities as they navigate AI adoption, making it imperative to develop governance frameworks that address these complexities while fostering growth.

The Current State of AI in Africa

AI is already having a profound impact across various sectors in Africa, including agriculture, healthcare, financial services, and education. From precision farming technologies that help optimize crop yields to mobile banking solutions that improve financial inclusion, AI innovations are tackling pressing local challenges and improving livelihoods. The continent is also experiencing a surge in AI startups, particularly in regions where tech ecosystems are growing rapidly.

Governments are increasingly recognizing the role AI can play in advancing development, driving economic growth, and creating jobs. However, the rise of AI also brings significant governance challenges. Africa's digital divide, infrastructure gaps, and varying levels of digital literacy require careful consideration to ensure that the benefits of AI are widely shared. Without adequate governance frameworks, there is a risk that AI technologies could exacerbate existing inequalities.

Bridging Africa's North-South Divide in AI Development

One of the key challenges for AI governance in Africa is bridging the gap between the continent's northern and southern regions. Northern Africa, with countries such as Egypt, Morocco, and Tunisia, has made strides in AI research and development, positioning itself as a key player in the global AI landscape. These nations have invested in academic research, built tech hubs, and established partnerships with international institutions, creating a strong foundation for AI growth.

In contrast, southern Africa has emerged as a leader in AI-driven social innovation. Countries like South Africa are pioneering the use of AI in sectors such as healthcare, agriculture, and education. Here, AI technologies are being applied directly to solve local problems, with a focus on grassroots innovation that improves the quality of life for citizens.

Collaboration between Africa's north and south is critical for creating a unified AI governance framework that leverages the strengths of both regions. Northern Africa's research and technological capabilities can complement southern Africa's practical applications of AI, fostering a more cohesive and effective approach to governance. By working together, African countries can pool their resources and knowledge, ensuring that AI development is inclusive and addresses the needs of the entire continent.

AI Governance in Africa: Priorities for a Sustainable Future

1. Ethical AI and Inclusivity

Ensuring that AI systems are ethical and inclusive is one of the most pressing challenges in AI governance. Without proper oversight, AI technologies may inadvertently amplify societal biases, leading to discrimination against marginalized communities. In Africa, where socio-economic disparities are already significant, the need for inclusive AI is paramount.

Governments and stakeholders must prioritize the development of ethical guidelines that ensure AI systems are transparent, fair, and accessible to all citizens. This involves addressing biases in AI algorithms, promoting diversity in AI research and development, and ensuring that AI technologies are affordable and accessible to people from different socio-economic backgrounds.

Inclusivity also means that AI technologies must reflect the needs and contexts of African societies. AI solutions designed for other regions may not be suitable for Africa's unique challenges, and local knowledge must be incorporated into AI development to ensure its relevance and effectiveness.

2. The Role of Governments in Shaping AI Policy

Governments play a crucial role in shaping AI governance, and many African nations are beginning to take steps towards developing comprehensive AI policies. However, there is still much work to be done. Many countries lack the regulatory frameworks needed to guide AI development and protect citizens' rights.

African governments must take a proactive approach to AI policy, working closely with industry leaders, academic institutions, and civil society organizations to develop regulations that balance innovation with public safety. This includes setting standards for data privacy, cybersecurity, and the ethical use of AI in sensitive areas such as healthcare and law enforcement.

Investment in AI education and skills development is also essential. As AI becomes more integrated into various sectors, there is a growing demand for a workforce that understands and can work with AI technologies. By investing in education, African countries can build a pipeline of talent to drive future innovation.

3. International Collaboration and Knowledge Sharing

Africa's integration into the global AI ecosystem is essential for accessing cutting-edge AI technologies and research. However, international collaboration must be balanced with the need for African countries to maintain control over their AI strategies and ensure that AI solutions are tailored to local needs.

By participating in global AI governance discussions, African nations can ensure that their voices are heard and that global AI policies consider the unique challenges faced by developing regions. At the same time, African countries should focus on developing homegrown AI solutions that address the continent's specific needs and challenges.

Intra-African knowledge sharing is also critical. Countries that have

made significant progress in AI governance, such as South Africa and Egypt, should share their experiences and best practices with other African nations. This will help accelerate AI development across the continent and ensure that all African countries can benefit from AI advancements.

4. Data Sovereignty and Privacy
AI relies heavily on data, making data sovereignty a critical issue for African countries. With much of the AI technology used in Africa being developed by international companies, there is a risk that Africa's data could be exploited without proper safeguards.

African governments must implement strong data protection laws that prioritize the privacy and security of their citizens. This includes ensuring that AI systems adhere to strict data privacy standards and that African countries retain control over how their data is used.

Developing local AI capabilities is another important aspect of data sovereignty. By building their own AI solutions, African countries can reduce reliance on foreign technologies and ensure that AI development aligns with their values and priorities.

5. Addressing Infrastructure Challenges
One of the major barriers to AI development in Africa is the lack of digital infrastructure. Many African countries still struggle with basic internet connectivity, electricity, and technological infrastructure, particularly in rural areas. Without addressing these infrastructure challenges, the deployment of advanced AI technologies will be limited.

Governments, private sector partners, and international organizations must work together to increase investment in digital infrastructure. Expanding internet access, improving electricity grids, and building the technological backbone needed for AI to thrive will be essential for unlocking AI's potential in Africa.

The Path Forward: Inclusive AI for Africa's Future

As Africa embraces AI technologies, inclusive governance frameworks that prioritize ethical standards, data sovereignty, and equitable access will be critical. Collaboration between northern and southern Africa, investment in infrastructure, and proactive policy development will enable the continent to harness AI's transformative power while ensuring that its benefits are widely shared.

By taking a leadership role in global AI governance discussions and focusing on homegrown solutions, Africa can position itself as a key player in the global AI landscape—driving innovation, economic growth, and social progress across the continent. TR

> Governments are increasingly recognizing the role AI can play in advancing development, driving economic growth, and creating jobs

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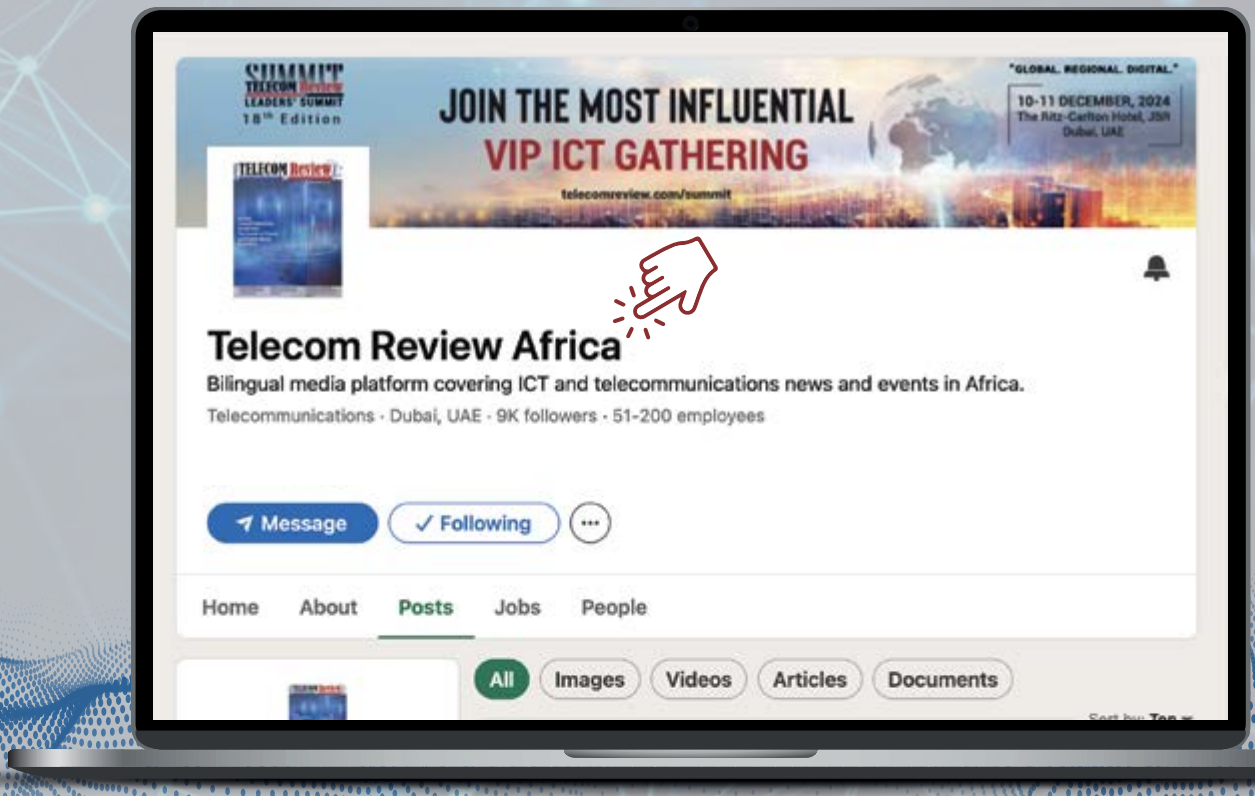

Transforming Industries through Service Providers

Service providers are at the forefront of industry transformation, driving innovation and modernizing operations across sectors such as telecommunications, finance, healthcare, and manufacturing. By delivering essential infrastructure, expertise, and technology, service providers help businesses adapt and thrive in a rapidly evolving digital age.

The emergence of next-generation networks like 5G, cloud computing, and the Internet of Things (IoT) has disrupted industries, and service providers are playing a central role in unlocking new efficiencies, enhancing customer experiences, and fueling economic growth.

As businesses become increasingly interconnected, service providers are becoming more crucial than ever. Whether it be through cloud platforms, advanced telecom networks, or data-driven solutions, these providers are the linchpins of modern industrial evolution.

The Role of Service Providers in Digital Transformation

Service providers have become key enablers of the digital economy, helping businesses transition from traditional models to more agile, technology-centric frameworks. From telecom companies to cloud platforms and IT consultancies, service providers offer unique capabilities to navigate the complexities of digital transformation.

Telecom companies, for instance, are deploying cutting-edge 5G networks, which bring unprecedented data speeds, ultra-low latency, and the capacity to support billions of IoT-connected devices. This technology opens new possibilities for industries like healthcare, manufacturing, and retail, providing opportunities for automation, innovation, and enhanced connectivity.

MTN Group has rolled out 5G services in countries like South Africa and Nigeria, offering faster speeds and improved digital services. Vodacom has launched its commercial 5G network in major South African cities, focusing on smart solutions for

businesses and consumers. Orange is trialing and preparing for broader 5G deployments, especially in Morocco and other markets, to support industry innovations and smart cities.

Cloud service providers (CSPs) offer transformative capabilities, giving businesses the flexibility to manage vast amounts of data, reduce operational costs, and improve efficiency. Liquid Intelligent Technologies delivers cloud services such as IaaS and SaaS, enabling enhanced scalability and security. SEACOM is providing hybrid cloud environments tailored to businesses, optimizing operations and reducing infrastructure costs. Dimension Data (Africa) offers managed cloud services, improving operational efficiency and reducing data storage costs. Meanwhile, Teraco is partnering with global providers to offer flexible, scalable cloud infrastructure solutions across Africa, supporting businesses' growing data needs.

Migrating to cloud platforms enables companies to streamline processes, enhance security, and foster real-time collaboration, with particularly profound impacts in sectors like finance, healthcare, and retail.

Key Industries Being Transformed

The telecommunications industry is undergoing a major transformation, with service providers leading the deployment of 5G networks, a fundamental overhaul of connectivity capabilities. This technology supports smart cities, autonomous vehicles, and advanced AI applications, revolutionizing sectors like manufacturing, transportation, and retail. Beyond consumer connectivity, telecom providers are enabling real-time IoT connections for industries like logistics and manufacturing, driving automation, efficiency, and productivity.

In the financial sector, service providers are advancing digital banking, fintech innovation, and mobile money services. Cloud providers offer scalable platforms that empower banks to provide secure mobile banking services, while telecom providers are expanding financial access in regions where traditional banking infrastructure is lacking, such as parts of Africa. Mobile money services are promoting financial inclusion by delivering accessible banking solutions to previously unbanked populations. Additionally, service providers are crucial in providing cybersecurity measures to safeguard against the rise of digital threats in the financial space.

In Africa, the healthcare industry is leveraging digital health solutions, telemedicine, and data analytics to enhance patient care. Zipline, in Rwanda and Ghana, uses drones to deliver medical supplies to remote areas, enhancing access to essential health services. Babylon Health's Babyl platform in Rwanda offers telemedicine services, allowing patients to consult doctors via mobile phones, while mPharma in countries like Ghana and Nigeria utilizes data analytics to streamline pharmaceutical supply chains. In South Africa, Hello Doctor provides telehealth consultations and personalized health advice through mobile apps, increasing access to healthcare.

During the COVID-19 pandemic, service providers were instrumental in maintaining healthcare continuity by supporting the necessary infrastructure for secure communication. IoT devices are also revolutionizing healthcare by enabling continuous patient monitoring through wearables and smart devices, improving outcomes and reducing hospital readmissions.

The rise of Industry 4.0 is transforming the manufacturing industry, where smart factories, IoT, automation, and data analytics are becoming the norm. Service providers are enabling machine-to-machine communication through 5G and IoT technologies, allowing real-time data flow that supports predictive maintenance, minimizes downtime, and improves efficiency. Cloud platforms also allow manufacturers to analyze large data sets from connected machines, helping them optimize production, reduce waste, and better respond to market demands.

Overcoming Challenges and Unlocking Opportunities

Despite the significant role service providers play in transforming industries, challenges remain. High infrastructure investment costs, particularly in developing regions, can slow down the deployment of advanced technologies like 5G. However, this challenge presents opportunities for innovation. Service providers are exploring ways to expand mobile broadband and offer more accessible cloud services to underserved markets.

Security is another critical issue as industries become more reliant on digital platforms. Service providers must implement robust cybersecurity measures to protect networks and data from increasingly sophisticated threats. Ensuring security and resilience is essential to the success of digital transformation efforts across industries.

There is also a growing demand for skilled personnel capable of managing these advanced technologies. Service providers are stepping up to address this gap by offering training programs and certifications to equip businesses with the necessary expertise to operate and maintain cutting-edge solutions. The MTN Academy provides ICT-focused programs in areas like 5G and IoT, empowering professionals to operate and maintain cutting-edge solutions. The Huawei ICT Academy collaborates with local institutions across Africa to offer certifications in cloud computing, AI, and 5G technologies. Safaricom's DigiFarm includes tech literacy training for rural farmers to leverage IoT and data analytics in agriculture.

Service providers are driving industry transformation, enabling the adoption of technologies like 5G, cloud computing, and IoT. Their ability to offer scalable, secure, and innovative solutions is modernizing sectors from telecommunications to healthcare and manufacturing. As service providers continue to evolve, their role in shaping the future of industries will only grow, paving the way for a more connected, efficient, and technologically advanced global economy. TR

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