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Offering a Diverse Digitalized Experience for Sustainable Business Success in the AI Era

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Indosat Ooredoo Hutchison Charts AI North Star Strategy to Excellence

China Telecom

Leading in the Intelligent Era with Cloud-Network Convergence and Artificial Intelligence

China Mobile Beijing

Building a Smart Home Ecosystem Centered around its AI Home Hub

HUAWEI

Building a Fully Connected, Intelligent World

Success Stories

All Intelligent Operations Enable New Growth

Operations Enable New Growth | O&M Assures New Experience
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Success Stories of Intelligent Operations

Maximizing New Growth Opportunities in the Mobile AI Era

"The opportunities are great. And the best time to act is now."

We are rapidly entering the mobile AI era, where artificial intelligence (AI) will become an integral part of every person's life, every home, and all industries. This trend will stimulate new demand and present incredible new growth opportunities for the ICT industry.

Multimodal AI devices will enable new forms of interaction. This will give rise to a better experience and greater productivity.

According to IDC, by 2028, global AI smartphone shipments will reach more than 900 million units, and there will be over 1,000 AI-native devices on the market. We will interact with these devices not only through touch, but also in many new ways, including voice, gestures, and even facial expressions. These interactions will be smoother and roughly 300% more efficient. For example, the newest generation of AI glasses can read lips with over 95% accuracy in noisy environments.

AI agents will change the way we work and live, bringing intelligent services everywhere. By 2030, most people will have a personal AI agent, and AI robots will play a key role in many industries. They will work nonstop to meet people's needs in all kinds of different scenarios, generating and processing over 100 times more data than we do today. This will provide a wealth of data for boosting digital and intelligent productivity.

These new forms of interaction and intelligent services will drive an unprecedented surge in data, which will drive structural changes in traffic models. For example, training large models will require incredibly rapid transmission between data centers. At the same time, AI applications and AI-generated content (AIGC) will need to transmit data between edge, cloud, and devices. This means there will be a rise in east-west traffic, and even mesh connections between multiple types of devices and hosts.

With these structural changes in traffic models, network optimization will be more critical than ever.

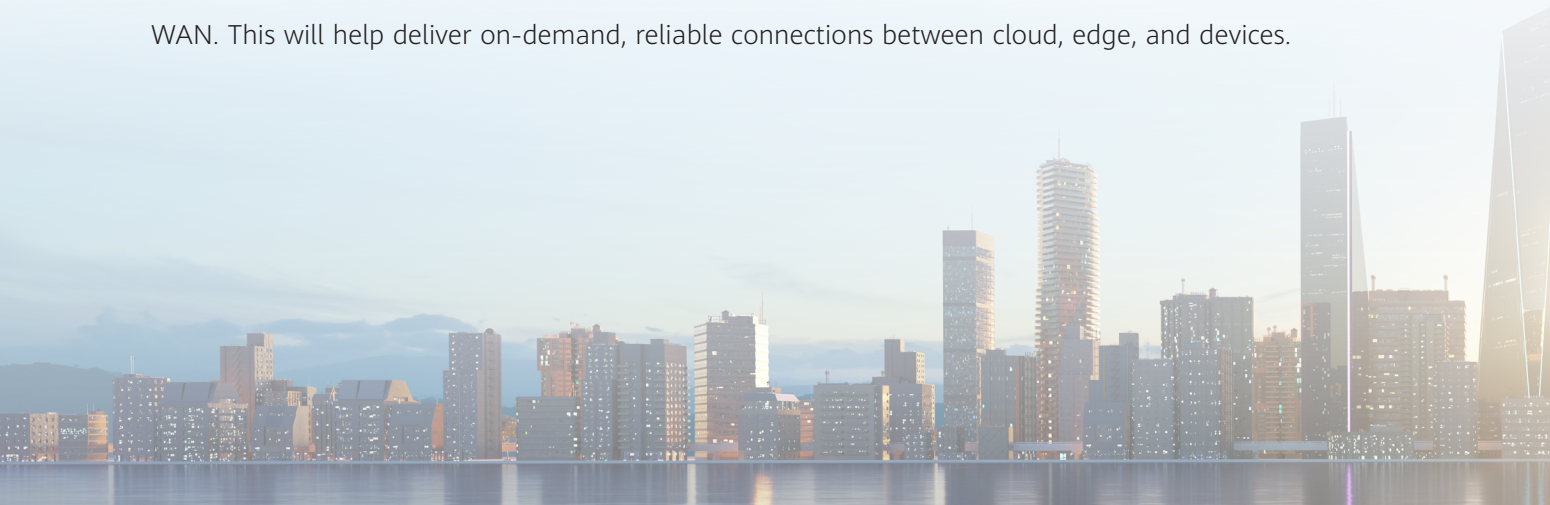
These are a few examples of the technological advancements and growing demand that we will see in the mobile AI era. If we want to seize new opportunities and pave the way for ongoing success, the industry needs to reshape capabilities across four areas: network services, infrastructure, O&M, and business models.

First, mobile products and services are the perfect access points for AI, so carriers can reshape their service portfolios to better meet demand. For individuals, homes, and vehicles, carriers can provide intelligent services via common touch points, such as calls and messaging, home services, and car cockpits.

5G New Calling is a great example. One Chinese carrier uses AI to help 24 million subscribers create their own digital avatars for voice calls and to provide real-time translation services. Moving forward, the carrier will introduce more value-added services, such as fault reporting, appointment booking, and meeting management.

There is also huge room for growth in the B2B market. Carriers can provide small and medium-sized enterprises (SMEs) with affordable AI services and devices, such as out-of-the-box kits for AI-powered shop management. These can help meet SME demand for rapid AI adoption. In addition, carriers can combine connectivity, networking, and AI capabilities to help enable the intelligent transformation of larger industry customers.

Second, carriers need to reshape network infrastructure to support a wide range of experience requirements for AI services. For example, network round-trip time (RTT) needs to be less than 50 milliseconds to ensure that AI assistants can deliver the most natural interactive experience. Carriers can also build AI-centric networks that support deterministic access, elastic scheduling, and lossless WAN. This will help deliver on-demand, reliable connections between cloud, edge, and devices.



Third, more complex networks means more challenging O&M. AI can support agile service provisioning, help guarantee user experience, and make O&M much more efficient. Carriers can use AI agents and copilots to handle O&M, gradually phasing out traditional service operations and network operations centers. For example, AI agents can automate task planning and orchestration for network maintenance, solving all software problems which account for 40% of all. At the same time, copilots can help field engineers quickly locate and fix the remaining 60% of problems which are caused by hardware.

Last but not least, carriers should consider reshaping their business models based on new capabilities in network services, infrastructure, and O&M. This will be crucial to go beyond traffic and start monetizing experience, and ultimately generate greater business value. Through AI-based services like New Calling and AI Hub, carriers can open up new revenue streams based on computing power, data storage, and VIP services. Carriers can also learn from cloud service models and expose network capabilities with open APIs. By monetizing network capabilities through open APIs, carriers can expand into the B2B2C market.

For example, some livestreaming companies and insurance companies are integrating network experience assurance and New Calling capabilities into their own services by using open APIs provided by a carrier. It's a win-win: the companies themselves can improve service quality, and the carrier has grown revenue from these companies by a factor of ten.

The journey is long, but we will reach our destination if we stay the course. In the mobile AI era, there are two things we can do to maximize new growth opportunities. First, we can use AI to automate network O&M, improve network efficiency, and deliver an unparalleled experience. Second, we can prepare networks to support AI product innovation and ecosystem development.

Huawei is ready to work with carriers and industry partners to make the most of networks for AI, and AI for networks. Together, we can unleash incredible new value.

By Li Peng,
Corporate Senior Vice President,
President of ICT Sales & Service,
Huawei

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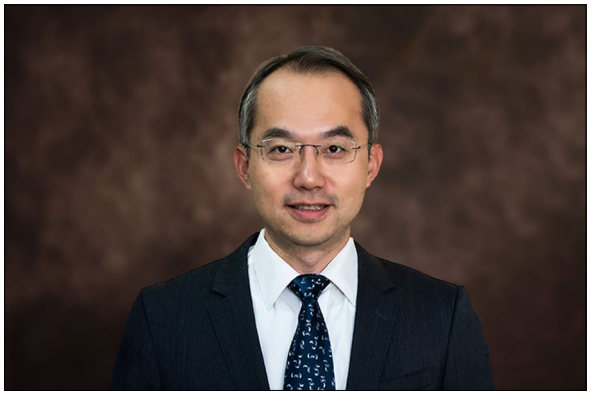
Leading in the Intelligent Era with Cloud-Network Convergence and Artificial Intelligence

By Tang Ke,
Vice President of China Telecom



With the advent of the artificial intelligence (AI) era, China Telecom has embraced a "network + AI + application" foundation, focusing its strategy on catering to customer needs to actively enhance personal and family information services. This approach has yielded notable success in expanding its broadband and mobile user bases. By mid-2024, China Telecom's broadband user base is projected to hit 193 million, featuring a gigabit broadband penetration rate of 27.3% and over 6 million fiber-to-the-room (FTTR) users. Revenues from fixed-line and smart home services are forecasted to reach 64 billion yuan, representing a year-on-year increase of 3.2%. Furthermore, the mobile user count has surged to 417 million, with mobile communication service revenues amounting to 105.2 billion yuan, an annual growth of 3.6%. These statistics not only underscore China Telecom's robust market standing but also highlight its unwavering commitment to fulfil the diverse needs of its users.

Building New Infrastructure Featuring Cloud-Network Convergence

Driven by market demands in the AI era, China Telecom is accelerating the transformation and upgrading of its digital information infrastructure. We continuously enhance our network capabilities and intelligent computing power, further strengthening its competitive edge in the market.

In terms of optical access, China Telecom and Huawei have achieved a ground-breaking milestone by verifying the world's first coexistence standard for GPON/10PON/50GPON. We've successfully established a 10G smart access network, and accomplished 10G application incubation, along with the implementation of 10G scenario. The number of 10G PON ports in the Gigabit optical network has surpassed 9 million, and the coverage rate of Gigabit residential buildings in certain towns in China has exceeded 90%.

Moreover, China Telecom has made significant efforts in optical networks to enhance the infrastructure of intelligent all-optical networks and swiftly established a 400G all-optical high-speed network, resulting in an intelligent and ultra-fast all-optical network with a flat architecture alongside intelligent operation. Additionally, we have developed the world's largest OTN network, covering 97% of cities, 98% of core aggregation nodes, and 95% of integrated access areas in China. Our 5G co-construction and shared base stations for wireless networks has surpassed 1.3 million in China as well.

China Telecom Cloud (Tianyi Cloud) has been in a leading position in the market. Its government public cloud infrastructure remains unmatched, and the exclusive cloud service has ranked first for five consecutive years. Meanwhile, the scale of China Telecom's computing power construction has also reached 21 EFLOPS.

A New Era of 10G Network for Households

AI applications have imposed heightened demands for bandwidth, latency, and device-cloud collaboration. In response, China Telecom is accelerating the development of 50GPON 10G broadband networks, edge clouds, and AI computing power, creating a 10G intelligent access network to ensure the end-to-end experience of AI services and provide more diversified applications across various scenarios. In 2024, China Telecom launched the world's first "10G Cloud Broadband Demonstration Community" and "10G Business Convergence Package" in Shanghai and formulated the 2026 Shanghai's All-optical 10 Gigabit City initiative. This ambitious plan aims to achieve comprehensive 10G network coverage across the city, establish 26 10G demonstration communities, facilitate the launch of 10G services, and spearhead the transition of home networks into the 10G era.

China Telecom employs a cloud-network convergence strategy that leverages its advantages in new metropolitan area networks and edge clouds. It has designed a converged edge architecture that maximizes network capabilities, offering high bandwidth and low latency. This enables families to access a wide range of cloud applications and cloud network services through edge clouds, facilitating the transition from traditional broadband to cloud broadband. In Guangdong, China Telecom has developed over 20 edge cloud application scenarios. For instance, when the popular Chinese game "Black Myth: Wukong" emerged recently, China Telecom developed a "gigabit broadband + edge cloud" solution by deploying hardware resources on the edge cloud. This ensures ultra-low latency from the household to the cloud, allowing consumers to enjoy the game using regular computers to connect to the edge cloud.

Innovative Digital Home Experience

For home networks, China Telecom is committed to enhancing technological advancements and infrastructure development for broadband networks. From dial-up Internet access to ADSL, LAN, and FTTH, we have seamlessly transitioned into the Gigabit FTTR era. In less than two years, the number of users utilizing China Telecom's FTTR services has soared from 230,000 to 8 million. As users enjoy enhanced network service experiences, the value of China Telecom's user base is also on the rise. These FTTR users are projected to generate additional

revenue exceeding 3.4 billion yuan (470 million US dollars).

In digital home scenarios, China Telecom leverages the capabilities of All-Optical Network 2.0, FTTR, and cloud-network convergence to achieve AI+ upgrades across four major digital platforms: digital home, device-cloud collaboration, smart community, and digital village, while comprehensively upgrading its digital home products.

Regarding home applications, China Telecom aims to enrich home scenarios by upgrading "AI + Products" to elevate users' smart home lifestyles. Firstly, China Telecom will advance the upgrade of "AI + Home Networking" through network AI model capabilities, achieving automatic tuning and roaming while offering high-speed, intelligent, seamless coverage, safe, reliable, and high-quality network experience. Secondly, it will upgrade the "AI+Tianyi HD" using the Telechat large model to deliver a natural, engaging, and personalized interactive experience. Thirdly, "AI+ Home Security" will be upgraded through device-cloud collaborative AI capabilities. Moreover, we will push forward the development of "AI + Family Health" utilizing a general large model. Lastly, we will upgrade the "AI + Xiaoyi Smart Home app" to better serve over 200 million users.

For families, China Telecom has updated the two major home and Internet security scenarios. The AI-powered video door lock boasts advanced stranger and delivery recognition algorithms, providing real-time and accurate "homecoming reminders for the elderly and children" while effectively monitoring strangers to ensure family safety. This system is a pioneering achievement in the industry, providing comprehensive, secured Internet access across all devices and applications. Also, it dynamically updates the AI anti-fraud strategies and analyses and identifies malicious URLs and abnormal access behaviours, thereby creating a safe and green Internet environment for the elderly and children.

In response to community needs, China Telecom leverages its smart community platform to offer a variety of smart community applications, such as street cloud and community cloud for government, property, and residents. These applications focus on scenarios including community governance, security, smart property, smart access, and 15-minute living circles. They aim to connect urban governance with smart homes to achieve refined governance and flexible property management, enhance residents' lives, and improve urban governance.

China Telecom leverages AI technology to empower Yijia Health (a smart health brand) in the healthcare sector, utilizing an industry-leading medical model to offer users with real-time AI consultation services and ensuring 24/7 access to private doctors for families. Additionally, by integrating health monitoring devices and adopting advanced AI models, China Telecom conducts intelligent analyses of user health data, location data, lifestyle, and more, while synchronizing health status among users, children, medical service organizations, and others to achieve a seamless service loop for home healthcare. In rural areas, healthcare devices and smart speakers has incorporated AI applications, such as AI Guardian and AI Consultation, to cater to the elderly. This integration links daily health monitoring data of villagers to the village committee and local physicians, facilitating prompt caregiving services.

China Telecom has developed a comprehensive rural AI visual communication application by integrating AI and visual communication in rural areas. This initiative targets governance scenarios related to water, waste management, and fire safety, employing AI alarm systems to prevent drowning, littering, and fire hazards, effectively protecting the lives and property of villagers.

For agricultural production, the Tianyi Shilian Farming Solution has been introduced. Leveraging Tianyi Shilian and IoT sensing devices, this solution employs AI functionalities, including regional intrusion monitoring, to supervise water temperature and quality in fish and shrimp

ponds. Additionally, it automatically adjusts production equipment and aids in preventing theft and illegal fishing, thereby safeguarding agricultural yields.

In terms of device-cloud collaboration, China Telecom enhances the capabilities of home networking and gigabit broadband by creating dual entry points on both the device and cloud sides, thereby enriching application scenarios. On the device side, a combination of a "small-model + digital home robot" forms an AI entrance that provides an interactive experience with visual, sound, hearing, and lighting. Meanwhile, the cloud side features a cloud AI entrance developed through "large models and edge cloud services" to deliver intelligent services for cloud protection, cloud living, and cloud work.

Create a Better Digital Life Together

China Telecom has developed the "Beautiful Home" digital life system based on cloud-network convergence and digital platforms. This system focuses on five key areas: safety, health, entertainment, low carbon, and intelligence, aiming to create a beautiful home for users in the AI era. Additionally, China Telecom continues to enhance its capabilities and services by horizontally connecting innovative communities and digital rural systems. By integrating home-community and home-rural initiatives, China Telecom ensures that the general public can live and work peacefully and happily, revitalizing rural areas while maintaining safe and orderly urban management.

Looking ahead, China Telecom remains committed to drive technological innovation, fostering industrial integration, and embracing open collaboration. We eagerly seek partnerships with all stakeholders to explore cutting-edge communication technologies and their application scenarios, establish a digital household ecosystem, share mutually beneficial outcomes, and jointly forge a brighter future together.

Indosat Ooredoo Hutchison Charts AI North Star Strategy to Excellence

Indosat Ooredoo Hutchison (Indosat or IOH) is Indonesian leading telecommunications company that has a larger purpose to empowers the nation. Having merged from two top players to one, the company has a thriving subscriber base nearly 100 million, connecting Indonesians across more than 17,500 islands. Together with its partner, Huawei, Indosat was the 2024 winner in the Telecoms Excellence category at the Glotel awards. In this article, Desmond Cheung, Chief Technology Officer at Indosat, navigates us through their journey to excellence.

By Desmond Cheung,
Chief Technology Officer of
Indosat Ooredoo Hutchison

When Indosat Ooredoo and Hutchinson merged back in 2022, we decided our vision was to empower and connect Indonesia as its preferred digital telco. In the spirit of mutual cooperation, our mission is to deliver world-class digital experiences that enrich society, and prop up the digital economy of our country. As part of our journey, we are transforming ourselves into a Techco so that we can better deliver world class digital experiences to enterprises, business, and governmental institutions, and other organizations.

The captain of every ship must navigate with precision and care to chart their course safely. Navigation is an art, of course, with many constantly shifting parts; but the

> At IOH, we must build ourselves up as an AI Native Telco, applying AI to every aspect of our business. With AI at our core, we are enhancing network services and can deliver an outstanding user experience.

one constant is the North Star, or Polaris, which does not move in the night sky. Our Polaris is the people we serve. If we use them to ground our sense of direction, we are assured to arrive at our destination.

We know people are no longer just asking for connectivity. They need more: they need access to digital services. The Internet is a need like water in modern society. And in the future, we believe AI will be as vital as air.

Following Polaris

This is why we have designed the AI North Star Strategy, oriented to the needs of the people first and foremost. Following this formula, we plan to revolutionize Indonesia's digital landscape.

Our growth strategy stands on three pillars. Firstly, at IOH, we must build ourselves up as an AI Native Telco,

applying AI to every aspect of our business. With AI at our core, we are enhancing network services and can deliver an outstanding user experience.

The second pillar is to evolve into an AI Native TechCo, which involves exploring new business, new technologies, and new industries. This will help us attract even more strategic partners and initiate collaborations similar to our relationship with Huawei to prop up the local digital economy.

Thirdly, Indosat is evolving into an AI Nation Shaper. As such, we have opened an AI Centre of Excellence so that we can create a talent ecosystem. This gives us the ability to bring in the best professionals to work in a nurturing environment that fosters growth. Through such an approach, we also lay a foundation for the development of national AI capabilities with key ecosystem partners.

The first stage of our plan has been to redefine the Digital Intelligence Operations Center (DIOC) to serve as the nerve center of Indosat's network operations. The DIOC can provide real-time insight and proactive service management, meaning we can monitor and predict issues. This way, we can solve problems quickly and work to prevent them from happening in the first place. This is

all in the name of customer experience.

Putting Customer Experience First

We have made such headway on our transformation journey thanks to centering on our customers. In collaboration with Huawei, our O&M is highly automated by AI, which allows us to perform experience-centric network consolidation. Huawei also initially helped us complete network integration using Multi-Operator Core Network (MOCN) technology in over 46,000 sites across Indonesia, which combined our separate networks when Indosat Ooredoo and Hutchinson first merged. We converged our Network Operations Center (NOC), Service Operations Center (SOC), and Network Performance Management (NPM) to bring all our data into one repository, which is essential to the new way we conduct O&M.

Following these game-changing upgrades, our mobile and broadband customers have benefited from better connectivity, lower latency and streamlined services. As a result, customer complaints have dropped by more than 30%. We can proactively predict issues and quickly spot the root causes of problems, which has fundamentally changed our technical customer support; our mean time to resolve (MTTR) is 55% faster.

Third-party reports show that our new-and-improved network leads in every dimension when it comes to voice, video, gaming and more. Huawei, as our partner, helps us bring the best user experience to the market. This has resulted in double-digit growth year on year in EBITDA, ARPU, and data traffic, as well as 23.4% growth in our Multimedia, Data Communication, Internet (MIDI) business.

Reaching for the Stars

To continue on this journey, there are two key points of orientation: people and data. Data is fundamental to future growth. The skills and abilities of our people, their knowledge, is our most important asset, the kernel of our organization. AI serves as the wind in our sails, our accelerator. This will propel our digital future.

We aim to improve our stability of operations through a data-driven approach with heightened levels of automation. This not only benefits customers but our own employees, as machine and AI assistance make their work burdens manageable even through our company's explosive growth. We look to heavily invest in research and development and provide a platform for innovation.

By making all our services cost-effective, we are pioneering to make AI a tool that is accessible to everyone. Just as we are working to eradicate the digital divide, we are also seeking to prevent a similar AI divide in the future.

At the moment, we cover about 93% of the entire nation, but are still working hard to increase that and deliver a marvelous experience to all. In particular, we think 5G will come into play here, particularly when coupled with our AI agents. Indonesia's digital economy is one of the fastest growing in the world — forecast to be worth $360 billion by 2030 — and we are excited to contribute to it.

Looking towards 2025, Indosat will continue to expand network coverage, striving to lead globally in AI applications across all facets of its infrastructure, especially combining AI capabilities with 5G technology. We are already seeing advances in AI aligning with mass 5G rollouts in Indonesia, creating optimal conditions for IOH to leverage the latest AI and 5G technology. For example, by coupling agentic AI with 5G, it will be possible for every child to have a personal tutor, every patient a personal nurse. And these are just a couple of examples of the vast potential of 5G plus AI. When state-of-the-art technology like 5G and AI is present, the ultimate goal is to democratize access, ensuring that all Indonesians—whether consumers or businesses—can fully benefit, leaving no one behind.

China Mobile Beijing: Building a Smart Home Ecosystem Centered around its AI Home Hub

By China Mobile Beijing

A significant shift in the technology world over the past year has been the rise of artificial intelligence (AI), particularly large language models (LLM), which have reached mainstream consumers and rapidly influenced various business sectors profoundly. This has revealed the great potential of AI as a groundbreaking technology to boost productivity and creativity across various sectors, making many previously unattainable scenarios or experience possible.

This is also critical for the telecommunications industry, which is pivotal in shaping ICT infrastructure. We have to think about how to constantly adapt to emerging trends and evolving demands driven by AI, focusing on building a transformative business ecosystem, seizing new opportunities, and driving sustainable growth - all while redefining and enhancing the user experience.

Launched in May 2024, China Mobile Beijing's home computing host, or AI home hub, has been well received. With the smart screen or television at the core, China Mobile combined it with the intelligent computing capabilities to build the smart home ecosystem and improve the user experience. This strategic approach has helped secure a favorable position for China Mobile Beijing as as a key player in the smart home system. It also stands out as an example of systematic approach in products, services and branding in order to find a way to sustained growth for the telecommunications industry in the age of AI. Notably, by integrating gigabit networks, fiber-to-the-room (FTTR), and advanced AI capabilities seamlessly, China Mobile Beijing has has paved the way for

upgraded smart home products offering better services and user experience, in line with the strategic move of China Mobile to market is newly created AI Home brand.

Tailoring Futuristic Products and Ecosystems for the Intelligent World

On May 21, 2024, China Mobile Beijing held the Mobile AI Smart Home Conference with the theme of "AI Home: Bringing More AI to Homes." The core technology of the new products and services launched at this conference are the AI Home Optical Network AI Suite and the AI Home Optical Network Computing Suite. They represent a key step in the efforts of China Mobile Beijing in experimenting with intelligent experience for home users.

China Mobile Beijing's AI home hub is an intelligent product that integrates communication and interactive capabilities. Its core is the precise blend of AI technology with the experiences and security needs of the home scenario, particularly for motion involved activities like AI motion sensing games that offer strong interactivity. It features high-definition sensors and connects to a large model of the visual-neural network, allowing it to recognize the movements of each family member effortlessly. Moreover, it can be expanded with set-top boxes, video phones, and smart speakers, enabling users to watch TV, make calls, listen to music, and keep an eye on their home. This transforms the house into an entertainment hub, allowing users to enjoy a private gym without leaving home. It also facilitates smooth video calls with relatives and friends while watching movies together simultaneously with synchronized audio and visuals.

The AI Home Optical Network AI Suite is fully compatible with the AI home hub. With AI home security devices and gigabit broadband at the core, it significantly optimizes home network and security. It has the intelligent capabilities to identify family members and the changes in their status, such as sending an alarm when infants and young children approach the fence or warning pets through voice when they approach areas unsuitable for them. It offers a full suite of safety services.

The launch of the AI home hub by China Mobile Beijing has been the result of long-term effrots rather a sudden leap to success. China Mobile Beijing has been trying to offer better and richer products targeting home users with upgraded user experience. The Smart Home Video connection solution, which China Mobile Beijing developed with Huawei, has wonmajor awards in China.

The Smart Home Video Solution connects to the IMS network through VIS, facilitating communication between large and small screens in all scenarios. It comes with a direct VoLTE connection and allows users to reach all the services on the terminals without downloading any additional apps. It offers large screen to large screen and large screen to small screen family calls, providing 1080P high-definition video quality to ensure users have a comfortable calling experience. At the same time, it enables sharing capabilities, allowing users to interact with relatives and friends in real time while watching movies, with accurate content synchronization, so they can watch movies and chat simultaneously. Such efforts in offering intelligent and interactive experience have been on the accord with the trends in the industry of going for intelligent home experience.

Moving Swiftly to Improve User Experience by Going Intelligent in Business

In terms of the user experience, China Mobile Beijing relies on the AI home hub and thenetwork products catering to the needs of households, combine them with intelligent features to improve the user experience and ultimately achieves an upgrade in its telecommunications business.

The AI home hub is the core integrating point of the smart home system. From the living room to the bedroom, China Mobile Beijing has created a convenient new experience in the smart era, including voice control for smart speakers, visualized management through smart displays, and connected, programmable home appliances, all contributing to making the home smarter, more convenient and safer. Moreover, with health

monitoring equipment added, the system can upload user health data in real time, provide alerts for abnormal physical signs and indicators, offer improvement consultations and suggestions, and deliver various services to safeguard a healthy life.

Migu, a subsidiary of China Mobile, also plays an important role. Migu and China Mobile Beijing have created a series of digital cultural applications utilizing 10G optical networks, such as 8K high-definition video, naked-eye 3D, AI motion training, and more. Migu's intelligent digital sports technology center leverages cutting-edge technologies such as 10G optical networks, computing power networks, and distributed cloud rendering to serve as a venue that integrates culture, sports, technology, and education. The facility features VR classrooms to offer children an immersive learning experience, as well as immersive sports games to provide users an unprecedented gaming experience.

China Mobile Beijing has introduced AI services to enhance the experience of its app users. Customers can easily access the service page on the app by activating the AI smart assistant, known as "Lingxi", with their

voice, allowing convenience for users. The mobile app features a large customer service model that employs AI customer service to assist customer service representatives in quickly understanding customer inquiries and improving accuracy and responsiveness. Various real-time and efficient online supports, such as autonomous troubleshooting, video customer service, remote service, and on-site visits by smart home technicians, will provide a comprehensive, multi-faceted, intelligent, and high-quality service for online and offline customers.

Building an Ecosystem and Improving Branding by Integrating Smart Home Products

China Mobile Beijing has managed to seize the business opportunities presented by increasingly diverse smart home scenarios, such as intelligent interactive experiences, which represent a major trend. The AI home hub can integrate a wide range of fitness and gaming applications, gradually forming an ecosystem. People pursuing a career would often go to the gym and kids may have to stay at home, resulting in a lack of daily sports activities. With the gradual maturing of application scenarios utilizing network technologies and intelligent capabilities, the fitness needs of family members can now often be satisfied at home. The growth of smart home experiences and ecosystem has allowed us to go beyond the traditional concept that a big screen is only for watching movies. The AI home hub thus becomes the key integrating point in the smart home ecosystem. By utilizing the computer vision, computing and bone feature recognition technologies, we can improving the accuracy of interactive applications and the real-time experience and sense of participation. China Mobile Beijing is dedicated to collaborating with industry partners to drive the comprehensive intelligent upgrade of smart displays from mere "watching" to “experiencing”, gradually building on the smart home ecosystem.

The move of China Mobile Beijing in terms of the smart home operations is consistent with the strategy of its parent group firm China Mobile. In 2024, China Mobile launched AI Jia, or “AI/Love Home”, playing on the pun of AI, which also means love in Chinese. It is fourth major consumer brand of China Mobile, after GoTone, Easy Own, and M-Zone. Marketing campaigns quickly followed, with China’s legend springboard diver Guo Jingjing as its brand ambassador. Guo has been known as for her positive attitude of hard work and sprit of striving for the better and her healthy image as a mother. Such initiatives show China Mobile’s ambition to capitalize on new business opportunities in the AI era and its fast move to act.

China Mobile Beijing launched major campaigns to promote its home products and services. China Mobile Beijing has launched special offers online, including supermarket vouchers and video memberships. Offline, it has further connected with customers by organizing various family-oriented club events such as sports, parent and kids events, and other lifestyle activities. China Mobile Bejing will continue introducing more innovative family-oriented events, allowing more and more of its mobile subscribers to enjoy the benefits of its smart home and lifestyle.

China Mobile Beijing will continue to work with industry partners to build the ecosystem of smart home operations combining the key elements such as the fibre, the network and the smart home and ushered in a new chapter in the smart home services brand of China Mobile Beijing with intelligence, warmth and assurance.

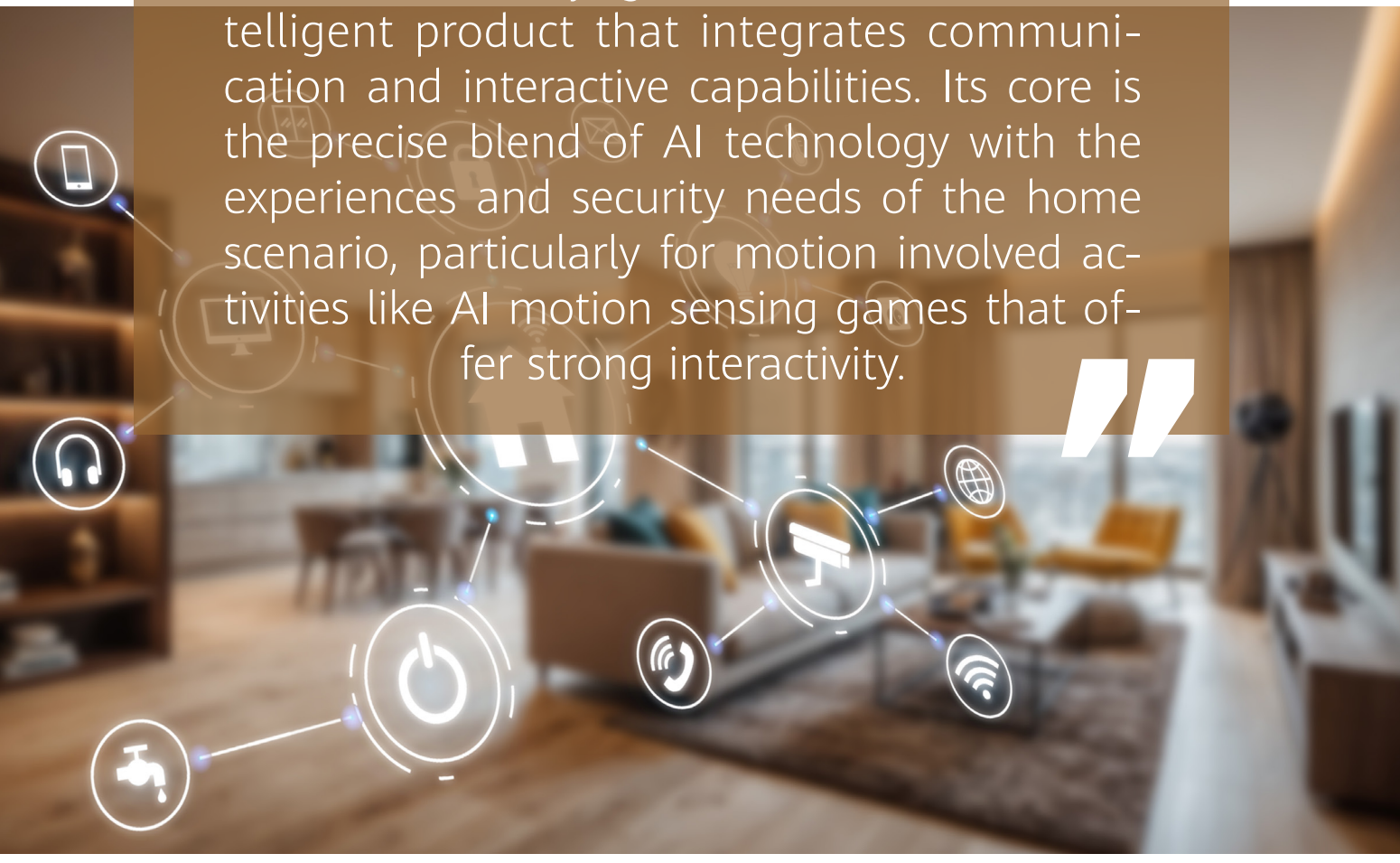
Beijing is the front runner in deploying dual-gigabit network. By the end of April 2024, there were an average of 52 5G base stations for every 10,000 people and 21.27 million 5G mobile phone users. 5G users accounted for more than 50% of the data traffic. There are 2.54 million gigabit broadband users, and a high-quality, all-optical transport network designed to achieve the lapse of "1ms within Beijing and 2ms around Beijing." As a result, the scale of Beijing's digital economy has continued to grow, consistently ranking among the front runners in the country.

Undoubtedly, AI is rapidly producing an impact on our daily lives. It is changing the way information and con-

tent are generated and the ways of interaction.It is improving efficiency by a hundred times, growing data traffic tenfold, revolutionizing the experiences of individual users, in the cars and at homes, ushering in a new era of intelligent Internet of Things, taking the industries to the age of intelligent digitalization and reshaping our life and work experiences.

AI will bring more possibilities when combined with the 10G networks and unlock new potentials and facilitate the digital transformation and intelligent advancement of society and industry. By expanding and improving the telecommunications network infrastructure, and integrating 5G-A/F5G-A and AI, we shall be able to produce great synergy, boost the productivity, and enhance the quality of life of many. China Mobile Beijing will continue working with industry partners to build the ecosystem in the 10G network era and contribute towards the industrialization and the growth of low-altitude economy. We shall continue to play a role in making Beijing a smart city and a leader in digital economy.

> China Mobile Beijing's AI home hub is an intelligent product that integrates communication and interactive capabilities. Its core is the precise blend of AI technology with the experiences and security needs of the home scenario, particularly for motion involved activities like AI motion sensing games that offer strong interactivity.



Offering a Diverse Digitalized Experience for Sustainable Business Success in the AI Era

By Dr. Ali Taha Koç,
CEO, Turkcell

As Turkcell celebrates its 30th anniversary, our financial performance demonstrates the strength and resilience of the company. In the third quarter of 2024, we achieved revenue growth of 6.9%, and our EBITDA increased by 10.4% on an annual basis to a 44.2% margin. Our net income rose to 14.3 billion TL. The solid performance was driven by strong results from both Turkcell Türkiye and our TechFin services.

We have also solidified our market position and strategically invested more in deploying advanced technologies such as 5G, enhancing fiber infrastructure, and pursuing renewable energy projects. Our focus on innovation also extends to data center and cloud services, which we envisage will give us an edge.

These achievements demonstrate Turkcell's tireless commitment to delivering value to our customers, shareholders, and the industry as a whole. We continue to pave the way for sustainable growth, leveraging our digital and technological assets to build a better future.

As we navigate an unprecedented era of intelligent trans-

formation, Turkcell is steadily advancing toward a future focused on digitalization and sustainability. By blending cutting-edge technology with strategic foresight, Turkcell continues to redefine the telecommunications landscape, proving that success in business today requires not only adaptation but also a clear vision.

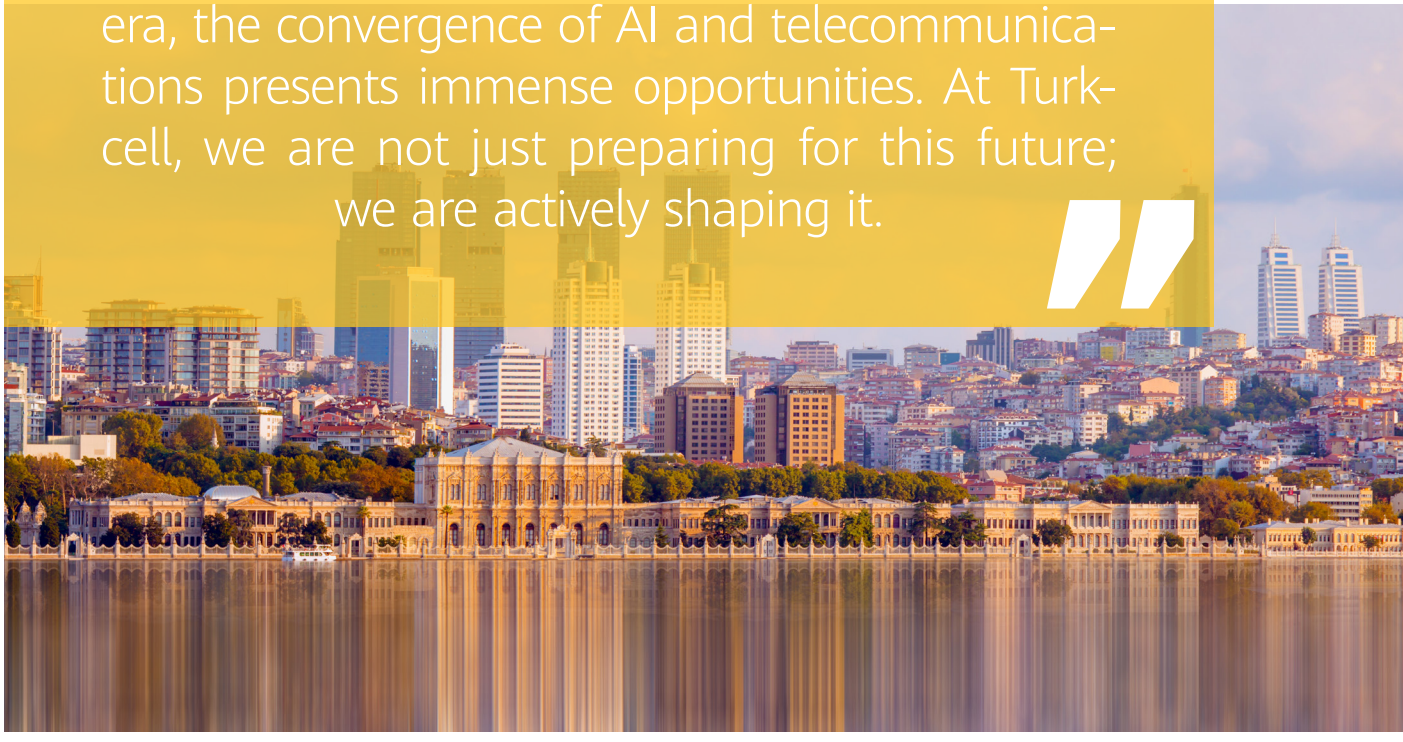
A Model of Resilience and Innovation

Turkcell's success stems from its pioneering approach to innovation, customer focus, and strategic investments. The company has gone beyond traditional telecom services by building a broad ecosystem in digital and financial technologies. With innovative solutions like Paycell and Financell, Turkcell has redefined financial services. Additionally, locally and internationally tailored platforms like TV+, lifebox, fizy, and BiP provide a wide range of digital content and services, enhancing customer loyalty. Turkcell's forward-looking investments in renewable energy, 5G infrastructure, and data centers demonstrate its commitment to maintaining technological leadership and shaping the future.

At Turkcell, we work to realize our vision for tomorrow by leveraging our operational excellence and customer-centric innovation. Moreover, strategic partnerships with global and local players have solidified our role as a key driver in Türkiye's digital transformation. As a result, Turkcell's unique ability to merge innovation with inclusivity and financial resilience makes it a standout success in the global telecom sector.

Furthermore, our strategic partnerships with global leaders like Huawei have strengthened our capabilities

> As we advance into the artificial intelligence (AI) era, the convergence of AI and telecommunications presents immense opportunities. At Turkcell, we are not just preparing for this future; we are actively shaping it.



in next-generation network technologies, including 5G and Dense Wavelength Division Multiplexing (DWDM). These collaborations enable us to deliver unparalleled service quality, aligning with our mission to provide our subscribers with the highest quality Internet service. The launch of 5G services at Istanbul Airport, a milestone reached in July 2022, further underscores our ability to lead the market with innovative solutions, setting a benchmark for operational excellence.

A Vision for the AI Era: Digital Transformation for Sustainable Success

As we advance into the artificial intelligence (AI) era, the convergence of AI and telecommunications presents immense opportunities. At Turkcell, we are not just preparing for this future; we are actively shaping it. Our strategy rests on two core pillars: 'AI for Network' and 'Network for AI.' These interdependent approaches aim to enhance the efficiency, scalability, and reliability of our networks while unlocking new layers of digital experiences for our customers.

AI for Network entails leveraging AI to optimize network operations, reduce operational costs, and improve service delivery. By integrating AI-powered solutions, we can predict and resolve network issues before they impact our users, enhancing customer satisfaction and operational resilience. These capabilities are particularly critical as we prepare for the deployment of 5G-Advanced (5G-A) services. Leveraging the predictive insights and automation capabilities afforded by AI allow, we can ensure a seamless transition to this advanced network technology. In turn, this allows us to deliver unparalleled connectivity experiences.

Meanwhile, Network for AI emphasizes the role of our network as an enabler for AI-driven applications and services. With robust infrastructure and strategic partnerships, Turkcell is well poised to support the proliferation of AI applications across industries.

The Future of 5G-A: A Gateway to Digital Transformation

The imminent launch of 5G-A in 2026 marks a significant milestone in Turkcell's journey of technological leadership. By leveraging this advanced technology, we aim to provide our subscribers with superior mobile broadband services while catalyzing Türkiye's digital transformation. Our ongoing investments in R&D and partnerships with key industry players, such as Huawei, ensure that we remain well-prepared for this transition.

5G-A brings new features and enhanced capabilities to connectivity, as well as the potential for new applications and use cases. This technology will enable unprecedented data speeds, low latency, and enhanced network reliability, facilitating the proliferation of Internet of Things (IoT) devices and unlocking new possibilities for businesses and consumers alike. With over 15 billion connected IoT devices expected within the next two years, 5G-A positions Turkcell as a key player in shaping the future of digital connectivity.

Sustaining Success Through Innovation and Collaboration

As we look to the future, Turkcell's approach to innovation is underpinned by collaboration and sustainability. By participating in global initiatives like the GSMA's Responsible AI Maturity Roadmap and playing a leading role in organizations such as the International Telecommunication Union (ITU), Turkcell is helping to define the standards and frameworks that will govern the next generation of telecommunication technologies.

Moreover, our commitment to environmental sustainability is evident in our investments in green technologies and our efforts to digitize industries across verticals such as smart cities, smart ports, and smart factories. These initiatives not only contribute to a more sustainable future but also reinforce Turkcell's role as a trusted partner in driving digital transformation across industries.

A Leader in Payment Systems

At Turkcell, we are proud to see how Paycell has become a key player in the digital payment ecosystem. Paycell stands out with its innovative services and unwavering commitment to delivering exceptional user experience. In 2024, Paycell not only sustained its strong growth momentum but also introduced transformative features that have redefined how payments are made in Türkiye.

One of the most notable achievements was the launch of the TR QR Code payment system, which allows users to make fast and secure payments by simply scanning a QR code with their mobile phones. This groundbreaking feature, which uniquely enables the use of both Paycell Card balances and 'Pay Later' limits, is a first in Türkiye. Furthermore, through strategic collaborations in sectors like e-commerce and digital gaming, Paycell has successfully expanded its ecosystem, reaching diverse consumer groups and solidifying its market leadership.

Looking ahead to 2025, we are committed to deepening Paycell's impact by focusing on open banking applications and sustainable financial technologies. With digital transformation accelerating, we aim to introduce environmentally friendly solutions while enhancing financial inclusion by offering secure, user-friendly payment methods to those without traditional banking access. Through these efforts, Paycell seeks not only to meet the evolving demands of a rapidly digitalizing society but also to drive the widespread adoption of cashless transactions. Our vision is clear: to remain a trusted guide in the realm of digital financial solutions. With a strategy rooted in innovation and a customer-centric approach, Paycell is well-positioned to continue leading the digital payment revolution, both in Türkiye and on the world stage.

The key to carrier success in the age of intelligence: New portals, new services, new experiences, and new operations

By James Chen,
President of Carrier Business, Huawei

AI has been the buzzword at recent industry events like MWC Barcelona, MWC Shanghai, and other forums and workshops. Carriers are preparing for the myriad of opportunities and challenges that will be created by AI, as they hope to harness this promising driver of business success.

New opportunities

Multiple generations of innovation have driven the telecommunications industry forward over the years. On May 24, 1844, Samuel Morse sent the world's first telegram through a wired line from the Capitol in Washington D.C. On March 10, 1876, Alexander Bell made the first telephone call at Bell Labs in Boston. On October 29, 1969, Charley Kline sent the first Internet message in Los Angeles.

Now, the industry is rapidly entering its next phase – the

> An AI agent like this intelligent assistant serves as a portal to AI and also the key to AI-driven transformation. This portal has the potential to enable the smart home ecosystem to truly take off and secure a favorable position in value distribution.

age of AI. AI-integrated networks will be key to navigating this new landscape.

Telecoms services are also evolving fast. Gigabit optical broadband already serves 300 million users in just eight years since its launch. It took 100-megabit broadband 14 years to reach the same milestone. Over 40% of global optical broadband users are expected to be on gigabit broadband by 2027. The average data rate provided by global home broadband packages has also increased dramatically over the past decade, with the nearly 600 Mbps rates of today projected to exceed 1 Gbps by 2028. In the mobile sphere, 5G has already become a mainstay, and 5G-A is just on the horizon.

The AI industry already has over 1,300 foundation models, and ChatGPT alone has 190 million active users globally. In 2024, about 300 million AI PCs and GenAI mobile phones were shipped and there were about 30,000 AI companies worldwide.

The boom in AI, underpinned by rapidly evolving networks, is driving a surge in new personalized and diversified demands. This, in turn, is promoting development within the communications industry.

AI is poised to create greater commercial value when integrated with networks. However, four factors will play a crucial role in expanding carrier markets, developing new services, enhancing market competitiveness, optimizing O&M, and creating greater commercial value. The key will lie in: new portals, new services, new experiences, and new operations.

New portals

AI agents will be the first step to creating new portals to AI. In the context of smart home services, AI agents connect people, things, and applications. They are designed to understand and respond to the needs of every family

member, control smart devices to meet home requirements, and connect AI applications to expand home service boundaries. These agents will help carriers make new business breakthroughs in the home market.

Some leading carriers have already released AI services specifically for home users. The South Korean carrier SKT, for example, has launched their own voice assistant. This intelligent assistant can provide users with a personalized schedule for the day, call a taxi to the airport, order a pizza for lunch, and even set smart devices to sleep mode.

An AI agent like this intelligent assistant serves as a portal to AI and also the key to AI-driven transformation. This portal has the potential to enable the smart home ecosystem to truly take off and secure a favorable position in value distribution.

Chinese carriers have also launched an AI host for home users. It can be connected to a TV in the living room, through which families can stay connected and engage in a range of activities, from real-time fitness coaching to fun motion-controlled gaming. Users can also make video calls with loved ones and watch live sports events with friends.

New services

AI is enabling many new services and aggregating high-quality content, which will further shape the AI-based smart home ecosystem. Smart home applications are expected to proliferate thanks to these new services and content, meaning TVs are set to become a multi-functional terminal for AI-powered services. This will be important for carriers looking to foster their own smart home ecosystems.

AI application monetization for carriers generally follows three steps. First, they can integrate AI into traditional services, such as video on demand (VOD) and home security, to improve user experience, satisfaction, and loyalty. Second, they can develop new AI-based features, such as motion-controlled gaming and interactive fitness, to enrich services and increase revenue. Third, they can integrate AI into their broader home services, such as aggregated ecosystem applications, to support home service robots that can provide services like healthcare, education, and home security. These steps allow carriers to gradually create smart home ecosystems that generate significant business value.

In the world of PC gaming, Black Myth: Wukong has not only taken the world by storm, but also proven to many how the above concept can work. The game itself was very high quality, with an excellent player experience. It sold 20 million units in just the first month after launch. However, to get the full experience, players need equipment that supports 4K resolution, ray tracing, and other such advanced technologies. This means they need high-performance PCs with high-end graphics cards that can cost nearly US$2,000. This is not an affordable solution for most. Some carriers seized this opportunity and launched cloud gaming services that allowed gamers to enjoy the same experience at just US$30 per month, or US$0.5 per hour if they opted for payment by hour.

Playing Black Myth: Wukong on the cloud requires high-bandwidth and low-latency (down to 5 ms) network connectivity, because AI rendering is done on the cloud.

New experiences

Emerging services, such as cloud gaming and smart cameras that can be used for home security, live e-commerce, and AI-based photo and video search, typically require high-quality networks, with varying levels of latency, jitter, uplink, and downlink. This presents new monetization opportunities for carriers if they can adopt novel business models. Carriers can charge by latency, uplink bandwidth, or AI features, or even by hour.

How can carriers plan their networks so they can provide a superior user experience required for new services? Simply put, 1 ms latency and 400G or 800G performance is needed for connections between data centers, while 1 ms latency is needed for connections for users to access computing power.

New operations

Another angle to this discussion is applications like driverless taxis which are already being commercially trialed in China. I tried one of these taxis in Shenzhen. They can safely move at a speed of 70 km per hour without a human driver and can deal with different road conditions with ease. These taxis also often come with self-service multimedia entertainment.

As networks become larger, they also need to be more autonomous. AI can be used to support high-level autonomous networks and improve O&M efficiency. Autonomous networks have been around for about five years, but we had not seen broad application beyond level 2 or level 3 autonomy until AI came into play. Levels 2 and 3 mean partial autonomy and conditional autonomy, respectively. With the support of AI, level-4 autonomous networks have finally become a reality.

Huawei's L4 Autonomous Driving Network (ADN), which is based on the Telecom Foundation Model, can benefit carriers in five ways: reducing customer complaints, shortening complaint closure times, improving service provisioning efficiency, reducing the need for site visits for installation and maintenance, and accelerating fault rectification. This Telecom Foundation Model is a specialized model that is trained with the experience of over 10,000 experts, knowledge gathered from over 100,000 sites, and 100-billion-word corpuses on telecoms.

After just one year with L4 ADN, one carrier in China has already seen their fault rectification times reduced from 2 hours to 20 minutes, and their percentage of faults automatically rectified increased from 60% to 90%.

As we are working to seize opportunities in the AI era, the four key factors we've discussed above do more than just reflect network technology innovation. These factors will also help further unleash networks' business value. New portals, new services, new experiences, and new operations supplement each other and will serve as a cornerstone for future business success.

To translate AI opportunities into business growth, we need perseverance and determination. Networks powered by AI are set to unleash more business value, and so, we will continue working with our carrier partners to turn our shared aspirations into reality.

Net5.5G Sets New Benchmark for Bearer Networks, Facilitating Business Success in Intelligent Era

By Zuo Meng,
President of Service Router Domain,
Data Communication Product Line, Huawei

To meet the stringent requirements of AI applications for network bandwidth, latency, reliability, and security in the emerging intelligent era, fixed networks — especially data communication networks — must be extensively upgraded and optimized. The rollout of Net5.5G, the next-generation target network defined by the data communication industry, is currently underway. In tandem, Huawei has introduced AI WAN, a router solution tailored for the AI era, to redefine the IP bearer network. With it fueling the growth of new services on carriers' networks, Net5.5G is a crucial factor enabling carriers to unlock business value in the intelligent era. Building on Huawei's research and joint exploration with carrier partners, we believe that AI WAN can help carriers meet diverse experience requirements in this era by developing multiple key capabilities, covering speed, latency, and guaranteed experience. AI WAN helps carriers reduce costs, increase revenue, and improve efficiency. It also facilitates significant growth in ToC, ToH, and ToB services, enabling carriers to achieve new heights in the new era along with continuous business success.

Multiple key capabilities drive the growth of new services on carrier networks

Carriers' bearer networks face ever-evolving requirements. The widespread adoption of artificial intelligence generated content (AIGC) has led to a major surge in video upload and download traffic, driving growth in network traffic. Predictions expect a tenfold increase in network traffic within five years, with AI-related traffic accounting for 70% of the total. In light of this substantial traffic growth, carriers must consider building networks with optimal TCO to minimize costs. Additionally, critical services provided by more and more carriers require accelerated experience monetization. For instance, emerging services like cloud gaming demand a network latency of 5 ms to deliver a high-quality experience. Furthermore, as network complexity continues to increase, leading to frequent network failures, the introduction of AI technologies is needed to ensure efficient and stable network operations. Consequently, carriers must enhance the core capabilities of their bearer networks.

AI WAN comprises AI routers, AI new connections, and AI agents, providing customers with novel experiences in AI-native 800GE all-service bearer, AI-driven differentiated services, and AI-centric intelligent O&M. AI WAN fuels the growth of new services on carrier networks by leveraging key capabilities such as 400GE/800GE all services, application identification–based differentiated services, and three AI agents.

First, at the network element layer, the NetEngine 8000/ NetEngine 8800 series routers provide AI capabilities and support 400GE/800GE all-service bearer. These routers offer intelligent sensing capabilities and implement AI-powered dynamic energy saving and AI-boosted intrinsic security, enabling carriers to construct networks with optimal TCO.

Second, at the network layer, AI-powered experience guarantee and application identification enable carriers to activate scenario-specific value-added service packages and provision various value-added packages on demand. This helps carriers implement differentiated experience monetization, accelerate business monetization, and boost their revenue.

Third, at the operations layer, AI-centric intelligent O&M introduces three AI agents that deliver full-lifecycle services covering planning, construction, maintenance, and optimization, helping carriers reduce OPEX. ChangeSpirit facilitates error-free network changes; FaultSpirit enables precise troubleshooting, eliminating O&M efficiency barriers; and OptimizationSpirit delivers deterministic experiences and maximizes network ROI. The three AI agents help significantly improve network O&M efficiency and ensure efficient and stable network operations.

AI WAN enables carriers to achieve multiple business benefits

At its core, Net5.5G boasts higher data rates and lower latency, enabling a seamless and uninterrupted real-time online interactive experience. The vision of Net5.5G goes beyond just faster network connections — it aims to be the cornerstone of a new intelligent era. For carriers, AI WAN promises more business monetization opportunities and greater value to carriers in terms of ToC, ToH, and ToB services.

Regarding ToC services, traffic is increasing rapidly, with an annual growth rate of 20% to 30%. In response, carriers are accelerating their deployment of 5G infrastructure, aiming to add 1.5 billion new 5G connections. Despite this, carrier ARPU continues to decline, and the industry faces intense price competition. To address this, carriers are introducing new services like extended reality (XR), ultra-HD video, and cloud phones, aiming to boost their revenue through enhanced user experience and operations. AI WAN enables carriers to develop 5G and 5G-A services, offers optimal service experience, releases suppressed traffic, and improves DOU.

Regarding ToH services, commoditized competition is intense in developed markets, prompting carriers to shift towards experience-centric operations. In addition, carriers are launching new services such as acceleration packages and video packages, in an effort to improve the ARPU

> AI WAN promises more business monetization opportunities and greater value to carriers in terms of ToC, ToH, and ToB services.

through precision marketing. AI WAN empowers carriers to perform precision marketing, identify high-value users, and boost home broadband revenue. It also offers high-value bundles like application acceleration and GreenNet to increase the ARPU. Furthermore, it provides experience assurance for applications, enhances brand competitiveness, and reduces customer churn rates.

And regarding ToB services, enterprises are expediting their digital transformation. More and more enterprise services are being migrated to multiple clouds, and both cloud and computing power are being increasingly utilized in sectors such as healthcare, education, manufacturing, and scientific research. In addition to requiring traditional private line services, enterprises now place higher requirements on bandwidth, reliability, and security. But in terms of competitiveness, carriers' traditional IP private lines fall short. The competitive edge of differentiated B2B products can be enhanced if one-stop services can be provided, helping to drive B2B growth. To address the diverse needs of industry cloudification, AI WAN can provide new IPv6 B2B private network services, enhancing the competitiveness of industry products and increasing B2B revenue.

Differentiated service assurance facilitates the development of computing power services

The rise of ChatGPT and Sora has had a profound impact on the development of various industries, as an ever-growing number of individuals, families, and businesses leverage AI to boost production efficiency. In the intelligent era, AI WAN will facilitate the development of computing power services.

As industry digitalization and intelligence take hold, there is a pressing need for computing power services across industries. Carriers are now expected to provide not only conventional private line services, but also cloud-based private line services and intelligent computing services. Despite the Internet historically not being truly data-centric, IPv6 Enhanced applications can now facilitate data circulation and management.

First, in scenarios where massive amounts of data samples are transmitted to computing centers, enterprises engage in AI foundation model training, giving rise to transmission demands of petabyte-scale big data. However, relying on private lines raises concerns over time-consuming transmission and unaffordable high bandwidth. Carriers can meet enterprise demands by offering elastic 10 Gbps private line package services. But unlike traditional services, approximately 90% of intelligent computing service traffic consists of elephant flows. For instance, in a cluster scenario comprising 10,000 GPUs, the network throughput efficiency is merely 35%, a reduction of more than 50%. By leveraging its industry-unique built-in intelligent flow awareness engine, Huawei facilitates precise identification of elephant flows and significantly enhances network transmission capacity to more than 90% through load balancing of the flows. In lab environments, the utilization of GPUs can be boosted by 50%.

Second, in AI training scenarios that combine local storage and remote computing power, many industries mandate that sensitive data not be stored at intelligent computing centers due to stringent data security requirements. Consequently, remote computing power must be accessed on demand through networks, requiring them to transmit sample data to remote computing centers for training. In addition to providing basic private line packages, carriers can also offer new remote training services involving sensitive data. Compared with traditional services, training data is one hundred times more sensitive to packet loss — even a 0.1% packet loss rate can result in a substantial 50% decrease in training efficiency. Huawei has successfully achieved zero packet loss over distances of up to 1,000 km by leveraging its RDMA-based in-depth load balancing and network-level flow control technologies, thereby boosting computing efficiency to over 95%. Innovative technologies such as network slicing have been deployed at scale, effectively meeting differentiated service quality assurance requirements. And leveraging new capabilities such as ultra-high WAN bandwidth, high throughput, and lossless transmission, carriers in China have begun building 400GE intelligent computing networks. These carriers plan to offer basic private lines to sectors like finance, scientific research, automotive, and education, while also introducing new services such as computing power leasing, elastic private line services, and sensitive data training to increase their revenue.

With the advent of the intelligent era, how can carriers capitalize on the emerging opportunities presented by AI to drive new business growth? First, carriers must leverage "AI for Network" to enhance user experience and boost service revenue. Second, they need to harness "Network for AI" to unlock new business opportunities and stimulate fresh revenue streams. AI WAN is a pioneering solution that fully addresses these two requirements, setting a precedent in its implementation. Net5.5G represents the most significant evolutionary step forward for data communication networks and is leveraging AI to propel high-quality development in the communications sector. In this intelligent era, we believe that the communications industry remains poised for sustained business success.

Understanding the Benefits of 5G-Advanced

By Ian Fogg,
Director, Network Innovation, CCS Insight
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5G is now middle-aged. This might be surprising to many who are not closely involved in the mobile industry, but 5G-Advanced is the midpoint in the range of 5G specifications that are together branded as 5G. Every few years the 3GPP, the key standards organization, publishes a new set of specifications. The first 5G standard was Release 15, and with 5G-Advanced, which was finished earlier this year, we have reached Release 18.

5G-Advanced will be the umbrella name for all the standards for the second half of the 5G decade, starting with Release 18. As such, 5G-Advanced provides a natural milestone for operators to relaunch and reposition 5G services. It even has its own logo!

With 5G-Advanced there are three main reasons for operators to deploy Release 18:

1. New services become possible. Examples here include use of smaller spectrum channel sizes and for RedCap offerings aiming to replace narrowband 4G-era offerings such as NB-IoT. Positioning is another area of interest.

2. New technologies materially improve previously possible services. Examples here include services based on

network slicing and non-terrestrial network (NTN) connectivity. There has also been further talk of mobile extended reality and cloud AI support too.

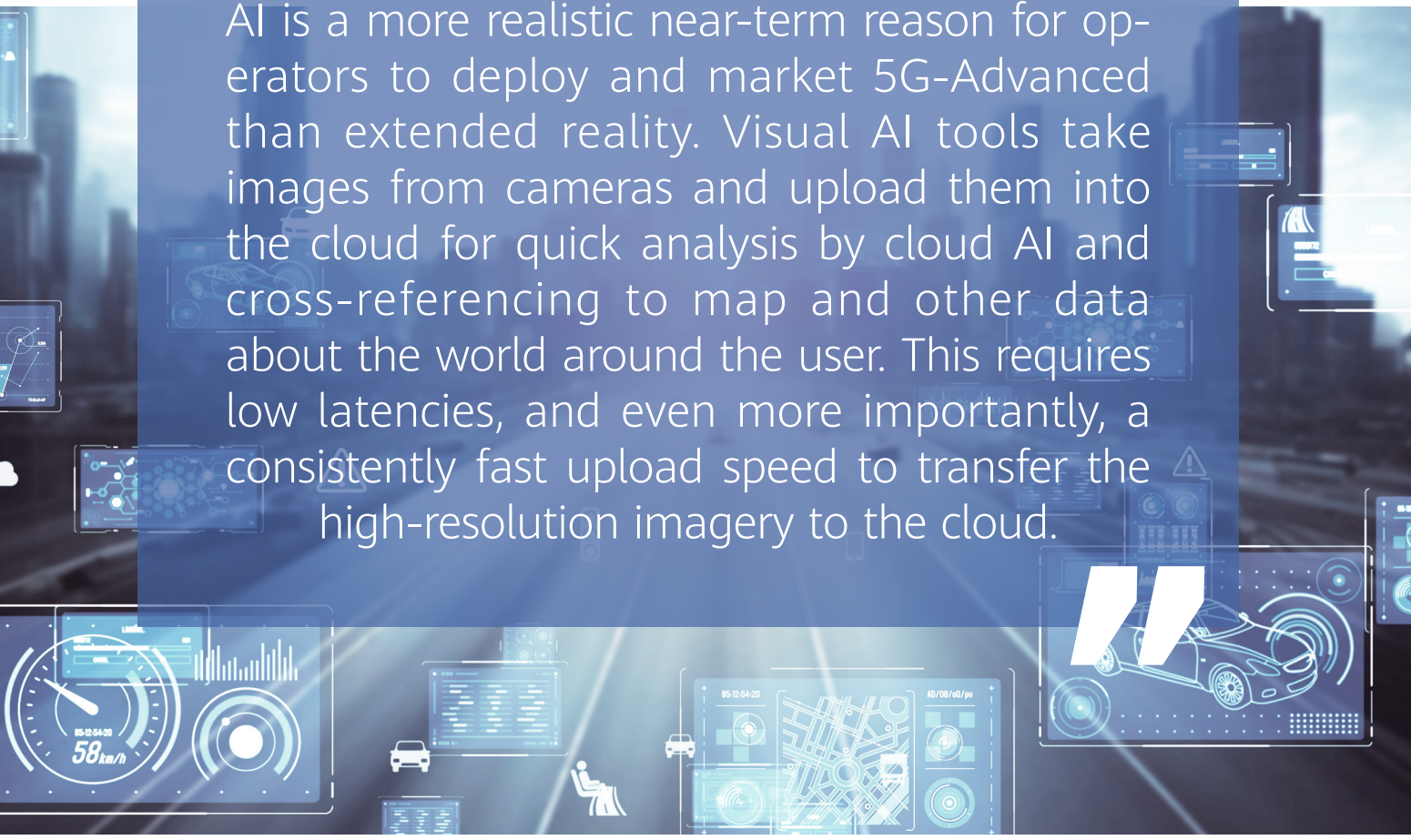
3. Improved efficiency. Release 18 brings technologies that help with better coverage and uplink performance, especially at the cell edge or in high-speed trains. There's also the potential for 5G-Advanced networks to be more energy-efficient.

To deploy 5G-Advanced, an operator must have a 5G core network and be able to offer 5G standalone (SA). At CCS Insight, we've seen renewed momentum for 5G SA in 2024, which we believe is because operators now see the attraction of 5G-Advanced features as a sizeable step up from what was possible with non-standalone. All operators launching 5G SA will move ahead with 5G-Advanced in time.

At the end of November 2024, 151 operators in 63 markets were investing in 5G SA — this reflects 31% of operators investing in any form of 5G. Of these, 30 operators are currently deploying 5G SA. All regions now have operators that have launched SA, notably including:

- Asia–Pacific: Dito (Philippines), Hong Kong Telecom, KDDI (Japan), M1 (Singapore), Optus (Australia), NTT Docomo (Japan), Singtel (Singapore), Smart (Philip-

> AI is a more realistic near-term reason for operators to deploy and market 5G-Advanced than extended reality. Visual AI tools take images from cameras and upload them into the cloud for quick analysis by cloud AI and cross-referencing to map and other data about the world around the user. This requires low latencies, and even more importantly, a consistently fast upload speed to transfer the high-resolution imagery to the cloud.



pines), Starhub (Singapore), Taiwan Mobile, Telstra (Australia) and TPG (Australia)
- China: China Mobile, China Telecom and China Unicom
- Europe: Three Austria, Deutsche Telekom (Germany), Elisa (Finland), Free (France), Cosmote (Greece), NOS (Portugal), Orange (Spain), TDC (Denmark), Telefonica (Spain), TeliaSonera (Finland), Virgin Media O2 (UK), Vodafone (Germany, UK) and Yettel (Hungary)
- Middle East and Africa: e& (United Arab Emirates), du (United Arab Emirates), Rain (South Africa), stc (Saudi Arabia, Kuwait, Bahrain) and Zain (Saudi Arabia)
- North America: AT&T (US), Boost Mobile (US), T-Mobile (US), Rogers (Canada), US Cellular and Verizon (US)
- South Asia: Jio (India)
- South and Central America: Claro (Brazil), Telecom Argentina, Vivo (Brazil) and TIM (Brazil)

In the rest of this piece, I will look at a selection of 5G-Advanced features and analyse the degree of importance to operators. The timing and degree of benefit of each area may differ between a public network operator offering services to smartphone users on a macro network and a private 5G network using a dedicated core network for specific machines or users.

Growing the Internet of Things with 5G-Advanced

Before Release 18, 5G technology needed a minimum channel size of 5 MHz. This was not a problem for re-using 4G spectrum bands or for new spectrum allocated specifically for 5G use. However, for low-band spectrum, especially for IoT, the amount of spectrum allocated was smaller and so 5G wasn't an option. Smart grids in the US are one example. Another is the 3 MHz channels common on GSM-R, used for railway communications. 5G-Advanced removes this limitation and makes 5G a viable upgrade path.

RedCap can also address new markets with 5G-Advanced. Although RedCap products arrived with Release 17, they targeted broadband services. With 5G-Advanced, RedCap modules can become even simpler and cheaper to target even less demanding IoT areas and replace NB-IoT.

Slicing and NTN Enhancements

5G-Advanced improves the flexibility with which operators can manage network slices, allowing these to be tailored for specific applications, for example, for augmented reality or to support autonomous vehicles. Other slicing improvements will be a long-term benefit because they rely on developments such as cross-operator slicing, where each operator will need to have deployed 5G-Advanced or NTN integration.

Improvements in orchestration to dynamically match changing traffic patterns or to ensure slice resources across core, transport and access domains will be more immediately useful for operators. Similarly, speedier slice deployment will make short-lived slices for events more practical.

AI Is Now a More Significant Driver for 5G-Advanced Than Extended Reality

Network suppliers and technologists have long positioned 5G as the ideal network to support all kinds of extended reality, from fully immersive virtual reality to smart glasses featuring augmented reality. Many of the early 5G demos back in 2016 to 2018 showed off virtual reality headsets. However, use of virtual reality is limited to a single location where Wi-Fi is good enough. Even now, many years on, there are no widely available 5G virtual reality headsets; they all continue to use Wi-Fi.

Symptomatic of this trend is SK Telecom's recent decision to close its virtual reality metaverse offering. In December 2024, the company announced it would stop taking on new customers and would close its Ifland service in

March 2025. At the same time, SK Telecom continues to drive forward as a leading member of the Global Telco AI Alliance and a range of AI-powered services.

Smart glasses are a different proposition. Wi-Fi isn't sufficient for a great experience because such lightweight glasses are a fully mobile product, moving between locations where cellular support exists but Wi-Fi doesn't — they need to work everywhere. For now, they rely on an accompanying smartphone, but this isn't ideal.

However, smart glasses are not a near-term reason for operators to deploy 5G-Advanced because of the challenges of creating compelling smart glasses hardware now. Existing devices either have a screen but no camera, such as Xreal's Air2, or a camera but no screen, such as the Ray-Ban Meta. Including both components with good enough onboard computing power and sufficient battery life would make the device too large to be a mobile offering. Apple's Vision Pro is a state-of-the-art example of this approach.

AI is a more realistic near-term reason for operators to deploy and market 5G-Advanced than extended reality. Visual AI tools take images from cameras and upload them into the cloud for quick analysis by cloud AI and cross-referencing to map and other data about the world around the user. This requires low latencies, and even more importantly, a consistently fast upload speed to transfer the high-resolution imagery to the cloud.

Release 18 improves Massive MIMO for uplink connections, improving spectral efficiency and beamforming accuracy. The impact is greater in difficult conditions at the edge of a cell. There are also enhancements in latency that benefit uplink performance, for example, improved scheduling reduces the impact of congestion on throughput, and on greater deterministic communication, which improves low-latency reliability.

Private Networks Benefit from Improved Positioning and Timing

5G networks rely on accurate positioning to enable network performance. They are also able to pass on timing information to client devices. With 5G-Advanced, a network will be able to maintain timing if a satellite service is interrupted, and use terrestrial atomic clocks and timing signals relayed by fibre links. This is a large opportunity. Already, there are 737 companies deploying private 5G networks globally.

Many private networks are indoors, such as in smart factories or warehouses, where automated machinery is managed by 5G networks. Here, precise timing and positioning is often needed and yet satellite signals do not penetrate. 5G-Advanced provides enhanced positioning, aiming at precision of less than 10 cm. Because private 5G networks are often greenfield, soon 5G-Advanced will be the norm for these deployments. CCS Insight forecasts global private network revenue will increase by a compound annual growth rate of 13% to reach $6.6 billion in 2028 (see Forecast: Private Mobile Networks, 2024-2028).

Making 5G-Advanced Work Is Critical for the Future

This represents just a selection of the many enhancements and new features in the Release 18 standard. Operators that wish to maximize their return on existing 5G investments in spectrum and networks can use 5G-Advanced to drive new revenue lines and make their network more efficient.

As a mid-life upgrade, 5G-Advanced may seem like a small step, but it's an opportunity to relaunch and reposition 5G as a far superior offering to older network technologies. It's an essential upgrade for any that wishes to expand its revenue opportunities or to expand its customer base into new industry sectors such as manufacturing, agriculture, automotive and public safety.

GenAI as a service: The 15X growth gem favouring telcos

Opportunities are most significant in banking, IT, government and retail, contributing to nearly a third ($24bn) of the total opportunity forecast in 2028.

Businesses are actively navigating through the uncertainties of new AI-fuelled innovative technologies such as genAI.

GlobalData research finds that 2023 had nearly 23,000 genAI Large Language Model (LLM) patent filings; businesses are 48-times more likely to deploy genAI than they were in 2023. Further to this, there are also ten-times as many jobs advertised for genAI-related roles than in 2022 which signals a real intent to close the skills gap. Another study found 74% of respondents in Q3 2024 believed AI would disrupt their industry, either significantly or slightly. GlobalData forecasts, genAI (a subset of AI) to generate nearly $9bn in revenue at the end of 2025 to over $75bn in 2028.

As a result of these investments, there will be the use cases which follow. On one axis, there are the industries benefitting the most, such as telecoms and media, healthcare, financial services, retail, and manufacturing. On the other, there are the cutting-edge use applications such as improvements in medical imaging diagnostics (GE Health Care); accelerating drug discovery (Pfizer) or creating individual beverage flavours tailored to regional preferences (Coca Cola). Telcos have many use cases optimising infrastructure and predictive maintenance (China Mobile); and banks are improving real-time fraud detection (JP Morgan) or improve credit scoring (Bank of America).

Recalibrating infrastructure

The question is not whether businesses will deploy, or identifying the potential business value; however, the conversation is more around making it work by address-

ing challenges related to infrastructure and skillsets.

As companies look to build their own, train or fine-tune an existing Large Language Model (LLM), each model under consideration will have a minimum of one billion parameters, powered by record levels of compute, memory, network, and storage resources. This will require networks to handle larger data sets (training and inferencing) at high throughputs. There will also be need for dramatic improvements in latency including routing optimisation and ability to scale linearly.

Telco's strengths to support genAI adoption

While most businesses stand to benefit from genAI, there are many challenges that stand in the way such as the tactical skill sets in areas such as data collection processes through to the infrastructure design. There are other broader strategic considerations such as setting up a Responsible AI framework which would consider explainability and traceability of data sources including prediction accuracy and consistency. Models will typically

> Telecom operators can mask the complexity of LLMs for businesses with capabilities already in their possession. At the infrastructure level, the industry will typically bring strong network assets including long-haul, metro, and last mile. Most will have their own data centres and metro edge nodes, which can be placed strategically to support the base level requirements for compute network, and storage with varying distance sensitivities.

need to show fairness and avoid statistical bias. Security posture should align to unique LLM risks, such as model poisoning, tampering and theft. Likewise, many of the higher growth sectors such as financial services, IT, government, health care and manufacturing, will need additional measures to meet industry specific compliance needs.

Telecom operators can mask the complexity of LLMs for businesses with capabilities already in their possession. At the infrastructure level, the industry will typically bring strong network assets including long-haul, metro, and last mile. Most will have their own data centres and metro edge nodes, which can be placed strategically to support the base level requirements for compute network, and storage with varying distance sensitivities.

The telco industry tends to be among the most heavily regulated industries which bring for themselves and customers they serve the ability to meet higher standards in areas such as compliance and customer privacy. The core network is often viewed by governments as 'critical infrastructure' which brings mature data collection and reporting processes, granularity and layered cyber defences. Furthermore, in some cases, telecom operators are sharing data with other sectors such as banking and government on areas such as threat intelligence.

Private cloud and genAI as a service

From a go to market perspective, both incumbents and leading challengers tend to have strong sales channels, partner ecosystems, customer support and operations to build out (or resell) ready-made products across the lifecycle. A strong physical presence, such as retail outlets, online channels, and direct billing relationships make them an enviable partner. Telcos will also have their own hybrid or multi-cloud capability, either direct or through partners which they use internally or sell locally. Many operators have advantages in purchasing power and experience in working across multi-vendor systems.

In terms of the commercial opportunity, there are at least two segments that stand out. Large enterprises, such as retail banking representing over 10% (or $903m) of the total opportunity in 2025. Operators can support these sectors in areas such as data centre design and connectivity and play an advisory role into compliance, governance and build these additional inputs into the reference architectures. The telecom sector also brings their own data sets, unique to each customer, that can improve the accuracy and/or security of LLMs.

The mid-market is also an attractive opportunity which can be upwards of 50% in total ICT spend and/or up to 99% of all businesses, in any given market. Mid-market segments tend to lack the internal skills to select, fine-tune, run and manage an LLM. They need to focus on improving productivity, efficiency and focussing on outcomes over technology. Budgets are also very limited. Plus, businesses with fewer than 100 employees, for example, tend not to have their own internal IT resources.

In these scenarios, a genAI as a service capability can be very appealing from a cost, commercial model, and risk point of view. Moreover, telecom operators should consider developing such a capability as they look for opportunities to leverage investments, diversify away from low-margin connectivity and thrust into services. A foothold into genAI as a Service should also have the potential to morph into a PaaS offer, or even marketplaces attracting many third-party offers, developers, and other participants.

Whether to support the mid-market in automating repetitive functions, or creating transformative industry plays, GlobalData shows an over $75bn opportunity in 2028 which is a 15X increase from 2023. While there is a healthy distribution across EMEA and Americas, APAC interestingly is showing just over 40% of the total opportunity. In addition, the opportunities are most significant in banking, IT, government and retail, contributing to nearly a third ($24bn) of the total opportunity in 2028.

AIS 3BB Fibre 3: A New Broadband Brand for the Smart Home Ecosystem

By Sunee Rojanaolarnrat,
Head of Broadband Business Portfolio and Planning, AIS

In 2016, AIS launched AIS Fibre, providing ultra-fast broadband to Thai homes. In November 2023, AIS merged with 3BB to create a new fiber broadband brand—AIS 3BB Fibre 3. This strategic move aims to not only elevate AIS's broadband business but also revolutionize smart living for customers across Thailand.

At AIS 3BB Fibre 3, we are dedicated to creating a better future through superior broadband services. Every innovation we introduce reflects this commitment. With the rise of AI and smart home solutions, our path forward is clear: integrating broadband with next-generation digital lifestyles.

Redefining Broadband in the Era of AI

The communications industry in Thailand is undergoing a profound transformation. Broadband is no longer just about connectivity; it is the foundation of a digital ecosystem encompassing smart homes, offices, and entertainment. As a leader in this field, AIS 3BB Fibre 3 is focused on digitalizing society by enhancing digital experiences and exceeding customer expectations. Our

> In the era of AI, broadband must deliver more than speed and reliability. It must unlock new possibilities with AI-powered intelligent network management and tailored solutions.

AI-driven strategy integrates smart home technologies with broadband services, unlocking new innovation and value-creation opportunities.

Empowering Thailand's Digital Transformation

With services reaching over 4.9 million households, AIS 3BB Fibre 3 has become a leader in Thailand's broadband market. Following the merger, our gigabit user penetration surged to 43%, driven by rising demand for high-speed, stable Internet access. Broadband now plays a pivotal role in enabling smart living across homes, businesses, and communities.

A Three-Pronged AI Strategy: Connectivity to Smart Life

AIS 3BB Fibre 3's approach to the AI era is built on three pillars: differentiated products, innovative technologies, and excellent services. Our strategy unfolds in three key phases:

1. Building a Nationwide Optical Fiber Network: Delivering high-speed broadband coverage across Thailand.
2. Expanding FTTR Services: Meeting home users' needs for stable, high-speed networking.
3. Integrating broadband with digital life scenarios for superior smart living experiences.

Differentiated Products for Smarter Living

The future of smart living demands broadband solutions tailored to diverse user needs. With an anticipated eightfold increase in smart devices and a fivefold rise in online gaming traffic, our FTTR packages deliver 1 Gbps Wi-Fi speeds to power smart homes. AI-enabled services, such as scenario-based acceleration for gamers and cloud applications, are designed to enhance user experiences in digital environments.

AI-Driven Network Intelligence

Technological innovation is at the core of our strategy. AIS 3BB Fibre 3 has developed a network platform that employs AI for intelligent monitoring and optimization. Our Wi-Fi-awareness platform analyzes application usage and network traffic, enabling precise identification and resolution of Wi-Fi issues. With the introduction of FTTR in 2023, our Home FibreLAN package provides 1 Gbps high-speed connectivity, offering seamless and stable Internet access—especially for multi-story homes. In 2024, we launched the upgraded Home FibreLAN Plus package, which combines gigabit speeds with IPTV, video content, and high-volume data plans, delivering unparalleled digital experiences.

Personalized Services for Maximum Satisfaction

Our success lies in personalized service delivery. Installation engineers conduct detailed site surveys to customize optical fiber cabling and router layouts, ensuring every room achieves stable 1 Gbps speeds. This personalized approach has improved customer satisfaction and consolidated our market leadership.

FTTR: Driving Business Growth and User Satisfaction

The launch of Home FibreLAN Plus has yielded impressive results:

- 30% increase in ARPU compared to standard broadband packages.
- 60% reduction in churn rate.
- A 70% improvement in whole-home Wi-Fi speeds and 10% reduction in latency, significantly enhancing user experience.

These advances demonstrate the potential of FTTR to drive service upgrades and meet the growing demand for smart home solutions.

The Future of Broadband in the AI Era

Despite Thailand's broadband penetration rate hovering at 37%, the rapid development of AI and cloud technologies is transforming home network demands. Consumers are seeking next-generation services such as cloud gaming, smart health, and AI applications. AIS 3BB Fibre 3 is committed to meeting these demands by providing not only basic Internet connectivity but also integrated digital and intelligent services.

In the era of AI, broadband must deliver more than speed and reliability. It must unlock new possibilities with AI-powered intelligent network management and tailored solutions. At AIS 3BB Fibre 3, we will continue to lead by focusing on innovation, customer experience, and smart home integration. By promoting digital lifestyles and advancing smart living, we aim to propel Thailand into an intelligent future.

Moving Beyond the Traffic-based Business Model

Zain Group is a leading Kuwaiti mobile telecommunications company, and a provider of innovative technologies and digital lifestyle communications. Mordi Al-Rashed, ICT Director at Zain Group, details Zain's intelligent transformation through the use of AI technology in its core network, and how this is enabling new business models to optimize user experience and improve operation efficiency.

By Mordi Al-Rashed,
ICT Director, Zain Group

Leader in Intelligent Optimization of Network and Services in 5.5G Era

Zain Group has been at the forefront of technological advancements in the telecommunications sector, playing a significant role in shaping the future of mobile networks in the Middle East and beyond. With a commitment to providing world-class services, Zain has consistently embraced cutting-edge technologies to enhance user experiences and drive service innovation. As a pioneer in the region, Zain Group has successfully deployed a wide range of solutions across its networks, ensuring that the company stays ahead of the curve in the competitive 5G landscape.

The launch of 5G services was a pivotal milestone for Zain, marking the company's commitment to enabling next-generation connectivity. In Kuwait, Zain became the

> 5G-Advanced key infrastructure investments drive refreshed market growth and industry digitalization.

first operator to launch Voice over New Radio (VoNR), a key advancement in 5G technology, which ensures seamless voice and data services in 5G environments. The deployment of the first New Calling service in Kuwait also demonstrates Zain's innovative approach, integrating AI with traditional voice services to offer richer, more personalized experiences to users.

Looking to the future, Zain is pushing the boundaries of 5G with plans to deploy Network Data Analytics Function (NWDAF) in Saudi Arabia, enhancing network intelligence and service optimization. Moreover, the company is preparing to implement Management Data Analytics Function (MDAF) as part of its strategy to drive further efficiencies in network management. These initiatives underline Zain's leadership in the 5G-Advanced era, where AI and data analytics will play critical roles in optimizing operations and delivering next-generation services.

Enabling New Business Models with Intelligent 5.5G Core

As we move beyond 5G into the 5G-A era, the role of the core network becomes even more pivotal. The evolution of the core network is key to enabling the next wave of service innovation. Zain Group recognizes that in this fast-evolving landscape, core networks must be flexible, intelligent, and capable of supporting a wide range of services, from traditional mobile connectivity to new applications driven by AI and the trend to connect all entities in the physical world and virtual world.

The core network is not just about connectivity; it's about enabling new business models. For years, the telecom industry has relied on traffic-based monetization models. However, as traffic growth slows and revenue stagnates, operators like Zain are shifting towards experience-based

operations. This transition is driven by the growing demand for ultra-high bandwidth, ultra-low latency, and personalized user experiences. Zain is leveraging the capabilities of its advanced core network, which incorporates both 5G and 5G-A features, to meet these requirements.

The integration of AI into the core network enables operators to enhance service delivery through machine learning, cognitive networks, and intent-based technologies. For example, the use of NWDAF to aggregate network data and apply machine learning algorithms allows Zain to predict and optimize network performance in real-time. This helps deliver the high-quality, low-latency experiences that consumers increasingly expect, creating new opportunities for service differentiation and revenue generation.

The introduction of AI-driven services like New Calling is also a significant milestone in this transformation. By incorporating AI into calling services, Zain is not just enhancing voice communications but transforming them into rich, multi-modal experiences. As mobile AI continues to evolve, New Calling allows operators to offer personalized, intelligent voice services that meet the unique needs of users, further driving interactive service monetization.

Service Intelligence: Enhancing the Voice Core with New Calling

One of the most exciting developments in the 5G-A era is the ability to enhance traditional voice services with intelligent capabilities.

During the Gulf Cup, Kuwait launched the screen lighting service based on the New Calling solution. During the call, on the background screen, subscribed users will see short videos such as game schedules and replays.

The New Calling platform can integrate AI apps or services, with the integrated AI technologies providing a smarter, more personalized experience for users. Whether it's through interactive calling, visualized voice, or seamless integration with third-party applications, New Calling is redefining how users interact with voice services.

New Calling's AI-powered capabilities enable operators to offer smarter calling features, such as personalized voice assistants, contextual information, and integrated media services. For example, users can receive real-time translations during international calls or access interactive voice-based services without needing to dial a number. This shift from basic voice to AI-enabled services is a game-changer, not only enhancing user experiences but also creating new business models for operators. By shifting from a voice-centric to a content-driven business model, operators can tap into new revenue streams and deliver more value to their customers.

As AI continues to develop, the opportunities for operators to enhance their service portfolios will only grow. The integration of cognitive networks, which apply mobile communications expertise to big data analytics, will allow operators like Zain to further explore things like intent-based communication and natural language interaction. AI will continuously improve the performance of voice services, enabling operators to provide a truly intelligent, dynamic service experience that evolves with user needs.

Network Intelligence: Optimizing User Experience

The 5G core network is not just about the speed and connectivity; it's about delivering a seamless, high-quality user experience. With the ever-increasing demand for high-bandwidth applications such as gaming, high uplink broadcasting, AR, and VR, network intelligence is crucial to ensuring that users receive the best possible experience across diverse use cases.

In Saudi Arabia we have focused a lot on enhancement of gaming experience. Saudi Arabia is building a global hub for the game and e-sports industry as a national strategy. In partnership with Huawei, we are working on HomePlayAccess service, part of the Mobile Home family of solutions, ensuring the gaming experience of

PSP users who are outside their homes. This is a sort of gaming VPN service that enables users to enjoy simplicity and performance of home wireless network outdoors, away from the comfort of their home.

Zain Group's focus on network intelligence centers on optimizing network performance through real-time data analytics and AI-driven insights. By leveraging NWDAF and AI, Zain can dynamically adjust network resources to meet user demands, ensuring a smooth experience even during peak traffic periods. Additionally, cognitive network technologies enable Zain to improve its network's ability to predict and respond to user needs, creating a more responsive and efficient service.

The integration of AI into the core network enhances not just the quality of the user experience but also the efficiency of the network. By continuously monitoring user behavior and network conditions, Zain can ensure that resources are allocated intelligently, preventing congestion and minimizing latency. This ability to optimize user experience in real-time is essential as applications become more demanding and user expectations continue to rise.

Automation: Improving Operational Efficiency

Operational efficiency is another critical area where AI and advanced network capabilities are making a significant impact. The rapid evolution of mobile technologies, particularly the shift to 5G and 5G-A, has increased the complexity of network operations and maintenance (O&M). However, the growth of AI and automation offers new opportunities to streamline O&M processes, reduce costs, and improve network reliability.

Zain has embraced AI to enhance its O&M capabilities, focusing on hyper-automation, self-healing, and self-optimization. These technologies allow Zain to automate routine maintenance tasks, predict potential network issues before they occur, and ensure that the network is always operating at peak performance. By using AI to monitor network health and automatically adjust configurations, Zain can reduce manual intervention and human error, leading to more efficient and reliable network operations.

Moreover, Zain is carrying out joint innovation with Huawei for AI-driven network maintenance. These AI-driven solutions will enable more proactive network management, helping Zain address the growing demands of network complexity without increasing operational costs. With these AI-powered solutions, Zain is positioning itself as a leader in network automation efficiency, ensuring that it can meet the challenges of the 5G-A era with confidence.

Moving Toward a Fully AI-Defined Future

The next-generation 5G-A network is designed to be much more versatile, connecting a wide range of services, from IoT and industrial applications to consumer mobile services. Zain recognizes that to remain competitive, it must embrace this convergence, connecting its network with a variety of industries and services to create new business opportunities.

The rise of Network as a Service (NaaS) is a key enabler of this convergence, offering industries customized network capabilities that are proactive, flexible, and resource-isolated. This approach allows Zain to deliver tailored network solutions for different sectors, whether it's smart cities, healthcare, or oil and gas industries. By le-

veraging its advanced 5G core network, Zain can provide the necessary infrastructure to support the growing demand for connected services, paving the way for a more intelligent and interconnected future. In this respect, Zain has developed its group technology blueprint that recommends open network API NaaS model development through industry standards for network APIs (3GPP, ETSI, TMF, etc.) and service APIs (Camara, GSMA, etc.).

As mobile computing power becomes more integral to the 5G experience, Zain is exploring the use of distributed edge computing to support a variety of business use cases. From video streaming and cloud gaming to industrial IoT applications, Zain's 5G-A network will provide the necessary computing resources to support these demanding services. Additionally, AI-driven scheduling and resource management will ensure that these services receive the appropriate computing power, improving resource efficiency and service quality.

Moreover, with the integration of AI, Zain is positioning itself to offer more personalized, intelligent experiences to users. By understanding individual preferences and behaviors, Zain can tailor its services to meet the specific needs of each user, further enhancing user satisfaction and driving new business opportunities.

Looking toward the future, Zain is committed to leading the change in creating an AI-defined future. Through its innovative approaches to 5G and beyond, Zain is laying the foundation for a new era of mobile connectivity, one that integrates AI, automation, and personalized services to meet the needs of a rapidly evolving world.

Zain's focus on enhancing core networks, service delivery, and operational efficiency through AI will enable the company to continue offering exceptional user experiences while driving business innovation. As AI continues to evolve, Zain is well-positioned to lead the telecommunications industry into a more connected, intelligent, and efficient future, where services are more personalized, intelligent, and accessible to everyone, everywhere.

By embracing the AI-driven future of 5G and beyond, Zain is not just transforming its own network — it is setting the stage for an entirely new era of intelligent connectivity.

Paving the Way to a Cashless Society: du Pay's Road to Success

du, the leading telecom operator in the country, launched the du Pay app in April 2024, catering to a large population not well served by traditional banks. It has made its mark by offering six languages, the only app on the UAE market to do so. Its explosive popularity has garnered it international attention. In this article, Nicolas Levi, CEO of du Pay, delves into the creation and vision of du Pay, and what the future holds for a cashless society.

By Nicolas Levi,
CEO, du Pay

When we talk about what it means to be a cashless society, people generally think of three major things: convenience, the environment, and traceability. There's never a worry you're carrying too much or too little, and with card and mobile payment, you're always carrying the correct amount. The ecological impact of using less paper and plastic is invaluable. And by creating a digital footprint with our accounts, transactions become entirely traceable. The UAE has made its own commitment that by 2031, its entire economy will be cashless. This is where du Pay comes in.

Mobile Money: The Natural Next Step

Though telecom operators are not banks, operators

across the world have launched successfully mobile financial service. They already have an enormous customer base across an immense distribution network, which has left them in the unique position to fill a gap in the market prime for mobile payment services. The cost of customer acquisition is much lower than for traditional banks, and they already have an established brand and data that can be capitalized on by empowering their fintech company. The telecom company can hence bring a unique value proposition to consumers to use their financial services, which is why we launched du Pay. Our journey started with getting the license from the Central Bank of the UAE and creating the company along with an app. Customer experience is key, and we built this app upon it as a foundation.

The Road to Financial Inclusion

Currently, with a population of 10.2 million people, about 60 to 70% of the UAE is not well served by traditional banks. Many are migrants who use salary cards and manage their finances entirely in cash, sending a large portion home each month. In fact, 88% of the entire population are migrant workers, making the UAE the second largest remittance market in the world after the US.

Surveys show that migrant workers have found financial services and remittance frustrating. The threshold for opening a bank account or heavy journey to go to physical branches are still painful. The government initiative to support unbanked workers, the Wage Protection System, was a step in the right direction, but did not provide remittance services. This meant they still had to spend their time and money trekking to a remittance agent.

While most of these customers may not have cards or lending capabilities, all of them will have a smartphone. Our app is very easy to use, and is the only one on the market to offer six languages, making it accessible and convenient. By offering bundles to our mobile custom-

> The modus operandi as a fintech, telecom operator, or bank should simply be to start where you can bring real value. This is how you can really build on your strengths and cater to a customer's needs.

ers who choose to use our financial services, it's great value for money, with attractive tariffs for remittance when sending money back home. du Pay offers the convenience of peer-to-peer transfers, mobile top-ups, bill payments and salary deposits, as well as a digital payment card. This even opens the gate to e-commerce for many who have never had the means to benefit from it.

Paving the Way to Success

Having a strong team and fostering strategic partnerships were key components to our successful launch in the market. Take for example our partnership with Huawei, by leveraging its technical expertise, we were able to develop an app with advanced and reliable core functionalities, which allowed us to focus on ways to adapt du Pay for the UAE market and accelerated our rollout.

The modus operandi as a fintech, telecom operator, or bank should simply be to start where you can bring real value. This is how you can really build on your strengths and cater to a customer's needs. We've realized just what we can do for this particular population, and in providing something different that's truly useful, we have had roaring success as a result and have received incredible feedback from our customers. Of course, this is just the beginning. du Pay can also be used to pay domestic workers and beyond. We are looking into how we can innovate in other financial services becoming at some point a super app for financial services.

Even Greener Pastures

It makes sense for customers to have both du as a mobile network and du Pay as their mobile wallet. du Pay gives the unbanked access to a convenient and safe digital alternative. We provide bundles with perks like additional gigabytes, and are the only one in the market doing so. With a large range of benefits, there's something for everyone; not just those who meet a traditional bank's threshold.

The link between du and du Pay is quintessential to all of this. Leveraging on each other's strengths is beneficial to both of us. From here, the only way is up.

MTN: Offering SASE to Capitalize on the Combined Needs for Network and Security

By Ibrahim Senyonga,
General Manager, Enterprise Business Unit (EBU), MTN Uganda

MTN has recently announced the commercial launch of its SASE solution, marking yet another key milestone in its efforts to capitalizing on the growing business opportunity that arises along with the increasingly complex needs of network access and, on top of it, security. A key strength of the solution offered by MTN is the intelligent features and the easy-to-deploy nature of the solution aimed to help the vast amount of enterprises in the region, small and medium enterprises included.

We expect the needs for digital solutions such as network and various other services to continue to proliferate as we usher in the era of artificial intelligence. Accordingly we shall try our best to offer the best products and solutions to meet such demands and grow our business in the enterprises market. We see it as an example of what we are trying to do in the digital services market on top of the network business.

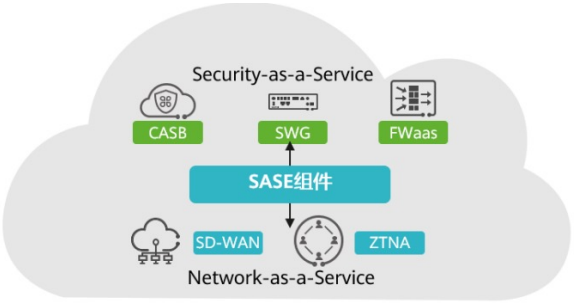
Growing needs of enterprises for network and security

MTN aims to be a leader in not just telecommunications network but also digital services. We have been steadfast in this strategy as we believe that the needs of enterprises have grown more and more sophisticated nowadays.

It has been an overwhelming trend in recent years to see the needs of enterprises for network and security services becoming more sophisticated as the digital transformation deepens and more and more companies deploy their operations on the Cloud. First, there has been a paradigm shift in the visitor traffic as more and more of the enterprise operations are put on the Cloud. Their maintenance teams have to manage and maintain the needs in terms Cloud, Network and Security, stretching the IT human resources. Second, remote work and home office have been more popular, and this has brought more risks as the employees log in to the internal network from various environment. There is a growing demand for secure network access. Third, network and security have traditionally been separate, resulting in larger costs as compared with integrated solutions combining both network and security services.

SASE, or Secure Access Service Edge, does exactly that. As a new type of architecture that provides Cloud-native network and security services, it meets the needs of the enterprises by addressing the challenges they face. The concept was first put forward by Gartner in 2019 and the leading service providers have since rolled out solutions meeting the demands of the enterprises. Typically, it combines the Network-as-a-Service (NaaS) comprising SD-WAN and ZTNA at the bottom, and Security-as-a-Service comprising CASB, SWG and FWaas on the top.

Small and medium enterprises in the Southern African market needs it, too. Given the rapid pace of migration to cloud, with the advancement of corporate intelligence, enterprise service data access needs have increased. Office traffic has increased from the headquarters to the branch. The security barrier has been indefinitely stretched. On top of that, there is the increase in pace of threats posed by multiple variants of ransomware



and viruses thus stretching traditional security systems in keeping up. The skillset of the enterprises in addressing the complex and evolving security threats is limited. Enterprises in general face the problem of security alarm fatigue.

Huge growth market where MTN has a strength

According to the Worldwide Security Spending Guide released by International Data Corporation (IDC), the IT investment in network security worldwide totaled 215 billion US dollars in 2023, and is expected to hit 373.29 billion US dollars in 2028, with a five-year compound annual growth rate (CAGR) of 11.7%. To seize the growth opportunity, MTN is vigorously deploying enterprise network security services.

Network operators have an inherent advantage in providing network security services for customers because all traffic is transmitted over their networks. It has the brand awareness, market experience, and extensive network coverage in Africa. The viability of MTN SASE solution has been verified in the finance industry.

It's worth noting that MTN has evolved from being a Telco to a Techco. We do provide end-to-end ICT solutions to enterprises under 5 main towers, including unified communications, IoT, managed network services, cloud, and security.

We expect the trend of increasingly complex network and security environment to continue as we move to the age of AI. The increasing trend of generative AI and

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ransomware industrialization has enhanced the viral variant pace.

With this vast solution portfolio coupled with ubiquitous state-of-the-art connectivity solutions, we have an innate advantage in providing network security services to our customers. That's why we are introducing the security solution, SASE, which is gradually changing the network security pattern of enterprises with its efficient, flexible, and unified network security management. Eventually we aim to be a one-stop provider for all round ICT solutions needed in the ever-changing digital world.

Joint innovation combining strengths of partners

In the process of bringing the SASE solution to the market, we have found a niche for MTN based on its strength such as the strong brand and the extensive operations across the Southern African region. We are the largest mobile network operator in Africa, bringing modern connected life to 288 million customers in 18 markets. We have been serving the enterprises customers in many countries, too.

Equally important is that we have been working close-

ly with Huawei by leveraging the capabilities of Huawei Xinghe Intelligent SASE Solution. The recent launch of the SASE solution is a joint action, too.

Huawei has a strength in its vast portfolio of ICT technological products and solutions, including its technologies in security and the Cloud. In fact, by leveraging AI-powered detection technologies, Huawei Xinghe Intelligent SASE Solution leads the industry with an unknown threat detection rate of 91%. Thanks to the Xinghe Intelligent SASE Solution, Huawei has won multiple awards including the Network Security Innovator of the Year given by the ITP Media Group.

The cooperation between MTN and Huawei will benefit the many enterprise users, including the small and medium enterprises in industries like education and retail. Our SASE solution will bring more efficient, intelligent, and secure protection capabilities to enterprises in Africa while opening up a wider growth market for us.

We expect to see the needs of enterprises to be more sophisticated as the trends of digital transformation and the needs for Cloud-native capabilities grow, even as AI further accelerates the pace of technological innovation across the world. We believe that by offering digital services where we have a niche, we can continue to capitalize on the new growth opportunities and achieve sustained business success.

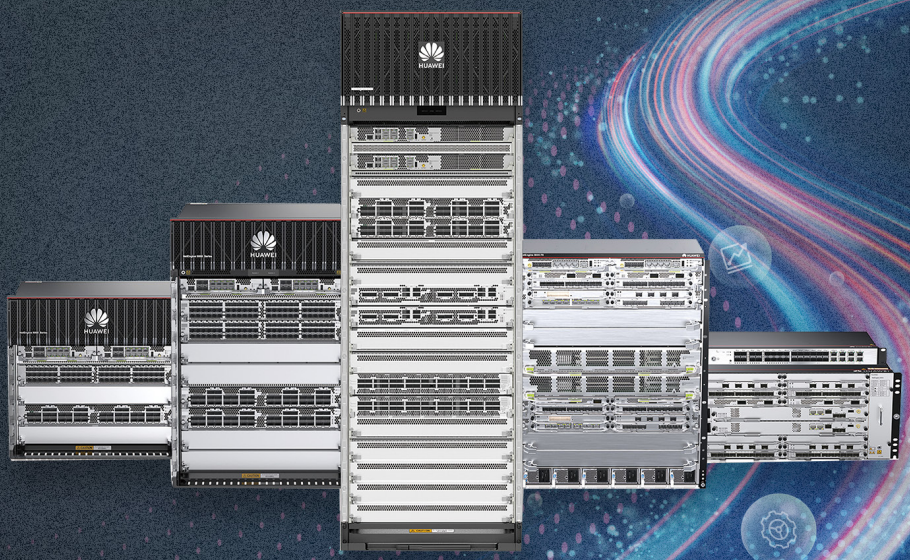
HUAWEI

Building a Fully Connected, Intelligent World

Huawei AI WAN

AI routers | AI connections | AI agents

Driving IP Bearer Network Upgrades in the Intelligent Era



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