

chapter Cellular networks 2



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The world as we know it is becoming more digital than ever, and this is just the beginning. Emerging technologies are opening up new opportunities that were unimaginable just a few years ago and changing the way we lead our lives, both at work and during our leisure time.

Connectivity is not just limited to devices and cars, it is revolutionizing industrial sectors from transport to utilities and health care and public safety, which is changing the way we do business.

The pace of change is staggering. In the Sub-Saharan Africa region, mobile broadband subscription penetration of the population is approximately 30 percent, but – with a young and fast-growing population – it is forecast to reach over 50 percent by the end of 2025.

The increasing demand for digital services and financial inclusion is driving the growth in mobile data traffic and most of the investments, traffic and subscriptions are in 2G, 3G or 4G networks. Modernizing existing networks, improving network performance and increasing user experience continue to be at the core of every service provider's day-to-day business.

Strategies for growing data revenues include improving network quality, providing data coverage in rural areas and making data-enabled devices more accessible and affordable. For service providers, there are risks, challenges and opportunities. They now need to focus on real-time network capabilities, to provide service differentiation, and they need to do it across a broad range of subscriber segments and across industries.

Important measures when improving network quality are moving subscribers to the highest possible network layer, activation

of key software features, removal of inconsistencies and alignment of parameters supporting selected network improvements.

And there have been success stories.

During 2019, MTN rolled out more capacity and additional sites on its 3G network to drive efficiency and better customer experience in Rwanda. Steps included adding software features and parameter settings to improve voice accessibility, call set-up time, and 3G data uplink coverage and capacity.

MTN Rwanda's network improvements led to positive developments across the board, with all key network indicators improving, including call set-up success rates and dropped-call rates. Recent root cause analysis of the network NPS data indicates the positive contribution of a good, reliable, strong and fast internet connection.

The network improvements and customer satisfaction increases are reflected in solid business performance for MTN Rwanda. This includes a market share increase of 11 percentage points to 54 percent at the end of the first half of 2019, compared with the first half of 2018, as subscribers grew by 23 percent – with revenue and EBITDA up 27 percent and 24 percent respectively over the same period.

Similarly, MTN's network improvements in Ghana – which included expanding and densifying 3G and 4G, as well as optimizing each access layer in turn, steered by KPIs covering availability, retainability, quality and traffic volume – also led to better KPIs, including call set-up success rates and dropped-call rates and translated into positive business results. Comparing MTN Ghana's first half of 2019 with the first half of 2018, voice revenue was up 13 percent, and data revenue increased by 26 percent. Overall, in constant currency, revenues increased 19 percent and EBITDA increased 24 percent over the same time period.

All network improvements are carried out within the context of actively lifting users to the highest network technology possible, to optimize the cost per erlang (voice) and gigabyte (data) served.

Attracting subscribers and keeping them happy depends not just upon the promise of compelling user experiences, but on the operator being able to deliver them, too. Service providers are increasingly bundling 'over-the-top' content in their service offerings – including music, premium sport and TV optimized for mobile networks in an attempt to create an environment where everybody wins.

Everyone – content owners, network operators, equipment vendors, and device manufacturers – can work together to create attractive services and elevate user experiences. Service providers benefit from the added perceived value of bundled content, using it to augment their brands through association with carefully-selected players. On the other hand, content owners benefit from the service providers' reach as well as their established capabilities for marketing, charging, and revenue sharing.

Improved network performance paves the way for sophisticated policy control, traffic categorization and quality-of-service delivery to flexibly respond to opportunities. These features can be used to allow location-specific service access, and for the tailoring of promotions.

Together, service and application providers can prioritize traffic, reducing download times for selected premium websites. Load times for web pages can be critical in determining a user's quality of experience, especially when browsing and buying online.

Every user, from a consumer or a connected car or a doctor, has different needs and different expectations. Each one is equally valuable, and their experience of network performance is all that matters.



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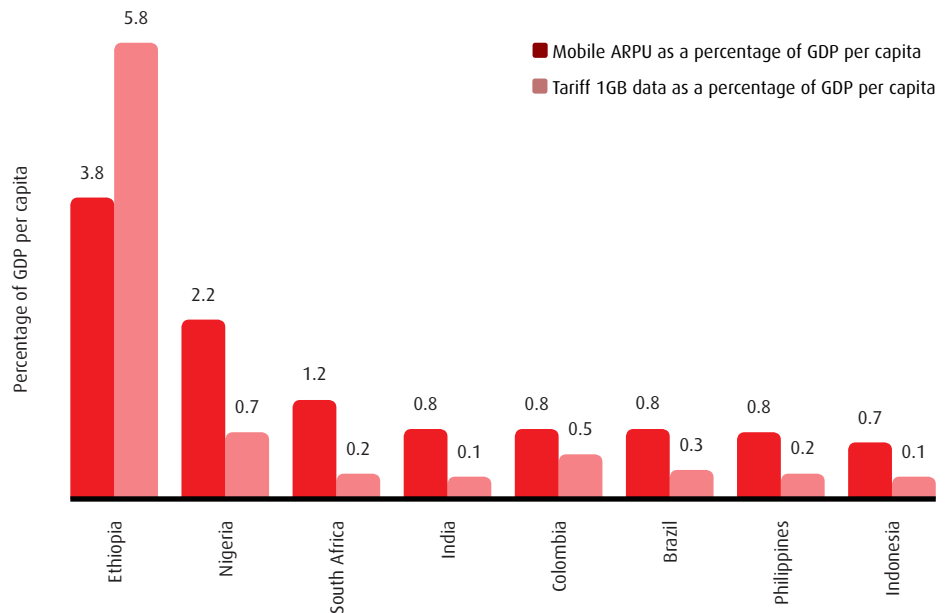
Ethiopia's telecoms market is opening up to outside investment, with interest from regional and global telecoms groups."

Ethiopia is one of the few telecoms markets worldwide that still operates under a monopoly. Government-owned Ethio Telecom (Ethiotel) controls Ethiopia's mobile market, as well

as the fixed telephony and fixed broadband markets, and the international gateway. This monopoly has resulted in an underdeveloped telecoms market: as of the end of 2018, only 42% of Ethiopians have a mobile phone, and only 14% have mobile broadband, which is low compared with other countries of a comparable size within the region, including Egypt, Sudan, Tanzania, Kenya and Uganda (see Figure 1). However, the government in Ethiopia has recently captured the wider attention of the global telecoms industry through its many initiatives to expedite the liberalisation of the telecoms market and to modernise the local telecoms infrastructure. This article discusses these initiatives in more detail.

Mobile SIM penetration of the population and mobile broadband take-up in Ethiopia are both low compared with other developing countries worldwide, and these trends are driven primarily by high mobile tariffs and the country's poor network coverage (see Figure 2). While 2G networks are widely available in Ethiopia (99% population coverage), 4G coverage is restricted

Figure 1: Comparison of mobile SIM and mobile broadband penetration in Ethiopia and in neighbouring countries, 2018



to the Ethiopian capital of Addis Ababa.

Ethiopia also has a notably low level of international connectivity, with international capacity to this landlocked country being provided exclusively by terrestrial cables. This has resulted in an average of only 0.6kbit/s of international bandwidth per capita, whereas Ethiopia's neighbour, Sudan, has nearly four times as much (2.5kbit/s per capita), and Kenya's and Egypt's international bandwidth per capita is significantly higher at 17kbit/s and 14kbit/s, respectively.



Derrick Chikanga,
senior analyst,
Africa Analysis

The Internet of Things (IoT) landscape in Africa continues to evolve as more industries adopt IoT technologies in their business processes. Key drivers of the development of this industry have been the need to increase productivity while reducing costs and eliminating potential losses. Furthermore, advancement in the ICT

JANUARY 2019

Safaricom announces its trial of new base stations for urban areas, involving new network technology with the ability to enhance urban area coverage. Tubestar base stations are claimed to be able to replace standard towers by a tubular structure occupying 75% less land area and requiring no protective perimeter, as all equipment is located within the tower. Powered by Lithium batteries and ideal for constrained spaces. Safaricom partnered with technology firm Huawei to construct its first Tubestar base station at Clay Works on the Nairobi-Thika Highway. The new base station location was previously plagued by call drops and signal convergence from other base stations causing interference and poor connectivity.

FEBRUARY

The Egyptian mobile phone market saw a sign of recovery in February, according to a report by International Data Corporation (IDC). The IDC report indicated that shipments in the Egyptian market increased to 14.4 million units. The

IDC's Quarterly Mobile phone Tracker found that shipments were 7-5% up, year on year, compared with a 20.6% decline in 2017, when performance was hampered by limited foreign currency reserves and the central bank's decision to float the Egyptian pound. While smartphones accounted for 63.8% of the market's units in 2018, shipments of these devices increased by just 3.4% year-on-year according to IDC.

The overall market's growth was driven by the feature phone category, where shipments were up 15.4% over the same period. Although the main vendors, Huawei, Samsung, Oppo and Xiaomi dominated the market, a local brand SICO achieved a 2% share of the smartphone market.

MARCH

Zimbabwe announces plans to merge two of its state-owned telecoms businesses, TelOne and NetOne ahead of proposed majority stake sale, to help offset state debt. Finance and economic development minister

Mthuli Ncube told a media briefing, that the government was looking to sell a significant stake in the two state-owned telcos. Ncube said the move would make the business more attractive to would-be investors.

South African telecom providers, Telkom and MTN have reportedly previously expressed interest in the two Zimbabwean companies. Ncube intimated that an approach would be made to the South African companies along with other interested parties for the purchase of the combined Zimbabwean telcos.

APRIL

In April the Kenyan Air Force was subject of an allegation of causing structural damage to communications masts in Jaldyse Village near Afmadow. According to Somalia's Hormuud Telecom an attack took place in late March and was the tenth such attack, previously staff members had been killed by the actions. "Hormuud Telecom regrets the senseless and unlawful attack by the Kenya Air Force on

sector and governments' ambitions to achieve their Industry 4.0 targets have been some of the key market drivers recently.

Industries have started appreciating the potential benefits from increased automation and the financial rewards thereof, hence the increased adoption of IoT technologies.

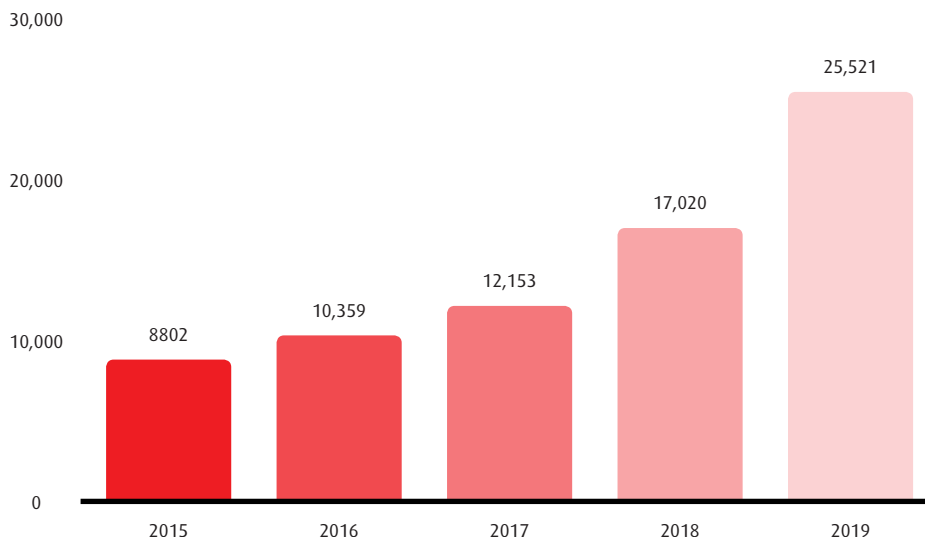
Major players such as Vodacom and MTN have continued to invest heavily in their IoT technologies to enhance their business offerings and tap into areas that present opportunities for long-term growth. As such the number of local IoT connections in South Africa, as measured by the SIM cards, has increased substantially, from approximately 7.3 million connected devices in 2015 to approximately 25.5 million devices in 2019. This represents a compound annual growth rate (CAGR) of 30.4%.

Key connectivity technologies that have been experiencing increased usage include mobile machine-to-machine (M2M) and Telemetry, as well as low-power wide-area network (LPWAN) connectivity. However, Wi-Fi and satellite connectivity have been experiencing modest growth due to the limited network coverage offered by such technology types.

LPWAN technologies that include Narrowband IoT (NB-IoT), LoRa and Sigfox continue to experience high demand in SA.

SquidNet remains the sole licensed Sigfox network operator in SA. The company has been expanding its network coverage to numerous industries that include agriculture, insurance, manufacturing, retail, transport and logistics, and utilities and energy. In the transport and logistics sector the compa-

Number of connections (thousand)



ny has enabled the development of smart logistics services that include asset tracking, warehouse security, food safety and stolen vehicle recovery. As such companies that utilise SquidNet's solutions have been able to optimise the supply chain by closely monitoring the performance of their assets as well as ensuring that transport conditions remain ideal for the products that will be transported such as agricultural produce and medicines.

Through various partnerships with companies such as IoT360, Macrocomm, Visiosoft, Adroit Technologies and Vox Technologies, SquidNet has been able to develop IoT solutions that enable the development of smart cities, smart buildings and smart retail. As such, SquidNet has

positioned itself as a major player in the South African IoT market, which is further supported by the backing that it receives from its holding company, Dark Fibre Africa (DFA).

Recent Developments

In 2019, Vodacom continued developing its IoT capabilities through upscaling its internal capabilities and acquiring emerging start-ups. Hence, in August 2019 the mobile operator acquired a 51% stake in IoT.NxT to leverage the technological capabilities of IoT.NxT in creating data-connectivity between new data sources and legacy systems. This acquisition will enable Vodacom to effectively drive its IoT strategy and transform its dedicated IoT

our masts at Jaldyse village near Afmadow," the company said. A major breakdown in communications and outage meant, residents could not access phone calls, internet and mobile money services. The company gathered forensic evidence to be handed over to any investigating authority since the actions were unjustifiable under international law. The United Nations Panel that monitors sanctions on Somalia had received reports concerning 12 attacks on towers from Hormudd Telecom. Subsequently the United Nations in a report says it has corroborated evidence of five attacks allegedly carried out by Kenya's military on communications masts in Somalia. Kenya denies the attacks, which have resulted in an estimated US\$5 million infrastructure damage.

MAY

Zambia announces implementation of biometric SIM card registration in January 2020 to combat fraud. Meeting held on May 21st, between regulator the Zambia

Information and Communications Technology Authority (ZICTA) and mobile network operators (MNOs), where the new directives were explained, and agreement achieved.

Edward Mulenga, corporate communications manager at ZICTA stated that all MNOs would be required to comply with the biometric standards, conduct regular interval verification exercises to ensure accuracy of SIM databases and furnish the authority with a report of all deregistered SIM cards.

He added that MNOs are required to relay to ZICTA the total number of subscribers with more than 10 registered MSISDNs under the same identity card.

"The authority will place obligations on the seller of SIM cards including use of identity cards for ease of identification," Mulenga said, "Failure to adhere to the directive will attract punitive measures within the law. MNOs should also send an updated dealer's register to the authority and a report on the agents responsible for any inaccurate registrations and fraudulent activities."

JUNE

At the launch ceremony in June Airtel announced Niger's first 4G LTE network. A year on from after Airtel paid US\$22m for its 4G license, the network is available nationally, making Niger the first country in Africa where Airtel's 4G network is available nationwide from launch.

Airtel, the dominant player in the country, described the feat as "a new chapter in the telecommunications revolution in Niger".

At the official launch ceremony, Niger's minister of posts, telecommunications and digital economy, said the launch chimed with the government's vision for the digitalisation of the country. Airtel believes that the implementation will promote a phase of accelerated inclusive growth. The government has the hope that a 4G LTE network will revitalise the telecom sector, improve digital services and accelerate growth of the local telecom sector.

Airtel controls more than 50% of the market, according to the Regulatory Authority for Telecommunications and the Post.

business unit into a highly profitable entity.

Vox Telecom continued to develop its IoT solutions to address the challenges that are currently faced in the farming sector. These solutions are related to livestock tracking using smart livestock collars. This has reduced animal losses and stock theft, and improved animal health. The animal collars that have been developed by Vox Telecom are linked to Sigfox towers that transmit information to Vox IoT Cloud infrastructure. This cloud infrastructure stores and relay alerts on the state and health of livestock to end-users.

Hence users of such technologies can set geofence to closely monitor livestock within a certain area and receive notifications should the livestock breach the geofence. Other benefits include observing animal activity and closely monitoring the health of livestock.

The weather conditions in South Africa and the rest of Africa have been changing dramatically with rainfall distribution becoming increasingly erratic in recent years. The City of Cape Town has experienced recurring draughts and erratic rainfall, and this has led to the growing need to develop technologies that address the challenges presented by adverse weather conditions. Hence, key areas that have been earmarked to address the weather-related challenges include environment monitoring, equipment monitoring and animal tagging.

Other key areas where IoT usage has gained traction in Africa include supply chain and logistics, smart manufacturing, insurance telematics, utilities and energy, farming and wildlife management.

Year in review: African 5G, it's coming sometime soon?

The year saw a steady flow of announcements of commissioning, implementation and roll out of 5G networks throughout the African continent.

The promise of an enhanced broadband experience with speeds of up to 1 Gbps and latency of less than 4 milliseconds and potential for a world of Artificial Intelligence, cloud based computing and interconnected devices with the Internet of Things offers a dream of a brave new communications world for African nations.

The reality, beyond the marketing hype, is more down to earth, in that only specific African areas and regions have implemented constrained 5G footprints.

The ongoing dilemmas for African nations are can they afford to invest billions of dollars and should they employ Huawei to provide networks at risk of the wrath of the United States, or do they go with reliable and non-contentious providers such as Ericsson or Nokia.

In considering these dilemmas, African nations should consider that China is the largest financial lender to Africa while also being its largest trading partner. Huawei is the major player in Africa when it comes to telecommunications infrastructure and much of that infrastructure has been made available to African nations via Chinese loans.

Africa needs to forge ahead with next-generation mobile telecommunications systems. If it is to develop a competitive advantage, beyond mineral and metal ore extraction, and needs to do it at a financial cost it can afford.

African nations have a history of infrastructure

building prompted by colonial occupying powers, using the free labour of indigenous peoples. In the last century African nations sought their place on the world stage and have pushed forward with the infrastructure of modern communications. In this century they have been slow to implement technological change across the board, partly based on the costs of implementation, lack of skills and, lack of need, beyond the transport, extractive and security sectors.

There must be a business case for new technology implementation and for many enterprises in Africa 4G meets all their present business requirements. This is where 5G operators step in to convince and try to sell 5G to enterprises, that will not see a return on investment. 5G is promoted as being the springboard into the High-speed internet era.

With African countries suffering the impact of the world recession can many of those nations justify the cost of 5G?

Back in July, 2019, The GSMA highlighted that the trend was towards a growing demand in sub-Saharan Africa for enhanced connectivity, but also pointed out that although 5G is a natural progression, its implementation is not necessarily imminent in most parts of the continent, basically because the existing technology supports the current use cases and demand for mobile internet connectivity. The African consumer market for 5G will be a trickle until affordable 5G compatible devices become available.

Having a 5G network that can support AI, in for example health applications, in an African nation that doesn't have a health system might

JULY

At the 9th North African Suppliers' conference in Morocco in July, Huawei put forward its goal for its Moroccan operations.

Chakib Achour, the marketing and strategy director at Huawei in Morocco said, "We want the kingdom to be the first to launch 5G in Africa." According to Achour, the company is now only waiting for the green light from the government. In March 2019 rival company Ericsson organized a live 5G demonstration at Maroc Telecom headquarters in Rabat, showcasing 5G's capabilities of faster data upload, download, stable connection and wider coverage.

According to a report by the Moroccan National Telecommunications Regulations Agency, access to the internet by Moroccan households has increased three-fold over the last eight years. Some 74.2% of households now have internet access.

AUGUST

Nigeria's telecom subscriptions increased by two million to 176.9 million in August

compared with the previous month of July at 174.9 million subscriptions, as notified by the Nigerian Communications Commission (NCC). Teledensity rose from 91.65% in July to 92.67% in August and has subsequently risen to 96.7% at the end of 2019. The NCC also revealed that broadband subscriptions had risen to 67 million in August from 64.4 million in July. The NCC attributes the increases over the last 5 months to steady telecom regulation.

SEPTEMBER

Mobile Broadband Limited trading as Vodafone Zambia, was put up for sale after shareholders were unable to keep the firm above water, because of stiff competition in the southern African data market. The country had 16 ISPs all fighting for market share, according to a report released by the Zambia Information and Communications Technology Authority (ZICTA). They include Liquid Telecom Zambia, Hai, Zamtel and Paratus Telecommunications, a subsidiary of the Namibia headquartered Paratus Group Holdings. Cash

strapped Vodafone Zambia struggled to maintain operations a year after it entered the local market in 2016, citing "financial distress". In July 2019, the company issued a statement announcing that the delay in recapitalising itself by the shareholders resulted in network outages in the capital Lusaka and the Copperbelt region. Vodafone Zambia said the so-called "financial distress" triggered a petition by employees to the High Court in Lusaka for business rescue. It led to the appointment of the business rescue administrator Luwita Sayila as the firm looked to attract new shareholders. A business plan to restructure the company's affairs was put in place, but Sayila issued a notice inviting bids to secure new ownership.

OCTOBER

October saw the release of a new report at the World Bank/IMF Annual General Meetings, which posed the question as to how Africa will connect an additional 1.1 billion people online by 2030. A statement from the World Bank highlighted that by the end of 2018 Africa had crossed the 400

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not be justifiable. Though in March Microsoft opened its African Development Centre at two sites in Nairobi Kenya and Lagos Nigeria followed by Google in April 2019, opening its first Artificial Intelligence laboratory facility in Africa, based at Accra Ghana. Safaricom plans to launch Kenya's 5G internet service sometime in 2020.

GSMA gives its view of the progression of 4G to 5G in 2019

The GSMA, which represents the interests of mobile operators throughout the world, reported in 2019 that 4G had become the dominant technology, with 4 billion connections and was set to grow significantly up to 2023. Consumer awareness has increased in relation to 5G but the costs of migrating to it are still prohibitive for most Africans.

Business must consider the costs of migrating to 5G while 4G is presently adequate for their needs.

Therefore, network providers, ever eager in seeking new revenue streams must balance demand and willingness to pay, against their own financial investment in new technology and networks to provide a service, that might not be fully needed at present.

The vast financial investment needed to roll out 5G networks to support the growing Internet of Things (IoT) market might be justifiable, but network providers still need to see profits and a return on the investment they made in 4G.

The GSMA indicate that by the close of 2019 there were some 5.2 billion mobile services subscribers or 62% of world population. Almost an additional 1 billion people have been covered by mobile broadband networks in the last 5 years,

continued increases will be partly dependent on cost and content as well as the services provided. As for those in the manufacturing, power generation and aerospace sectors, GSMA indicates that they are still in the evaluation stage, as to if they will migrate to 5G for the digitisation of product assembly and general operational management. For African enterprises to capitalize on Artificial Intelligence, robotic working, sensor operation and automated production they will of course need to migrate to 5G.

MTN starts testing of 5G in West Africa

MTN started testing superfast mobile internet in the West African state of Nigeria, towards the end of 2019. Specifically, it trialed 5G in Abuja and Calabar, which naturally invoked excitement in the tech sector. Nigeria has the expectation that it will be able to roll out 5G in its larger cities in 2020. South Africa and Lesotho consolidated their small scale 5G rollouts in 2019, while Gabon starting a system trial.

AMN and ip.access partner up in Zambia for 4G/LTE

Africa Mobile Networks and ip.access announced their deployment of 4G/LTE in Zambia.

The partners stated the deployment was a progression from their 3G Small Cell deployments in order to extend rural cellular coverage across the underserved countries in Africa.

The rollout is intended to cover seven countries, Zambia being the first. The

network was constructed around the ip.access Viper™ solution, consisting of the nanoVirt™ 3G/4G virtualised gateways and management system. The company stated that the small cells are installed on a tower near, for example, the centre of a village to deliver mobile coverage to the community. African Mobile Networks (AMN) builds, owns, operates and maintains the infrastructure.

Biometric SIM card registration, a way forward for Africa in Fraud prevention

Fraudsters are creative in their ways, always seeking innovative methods to relieve the weary of their hard-earned wealth. Mobile phone fraud is an insidious creature and has no sympathy for the individual it harms by means of fraud.

In June Zambia announced it was to implement a plan capable of limiting some aspects of fraud. A simple plan, that some might say was invasive in relation to privacy, but one that works on information the state already holds. The Identity Card (ID) needed to register a SIM card in Zambia has been available for some time. The biometric ID cards are embedded with a secure chip containing both biographical and biometric data. The system of SIM card registration will allow the state to identify the purchaser of a SIM card and thus assume as to who is using it to send messages, download data and make calls.

The system is open to the criticism that it infringes the right to privacy and to freedom of expression, but Zambia is just joining a long list of countries that have SIM card

million mark for broadband connections at 20 times the number in 2010. The report, entitled Connecting Africa Through Broadband, A strategy for doubling connectivity by 2021 and reaching universal access by 2030, found that less than a third of Africa's population has access to broadband connectivity and achieving universal, affordable and good quality internet access by 2030 will require a US\$ 100 billion investment or close to US\$9 billion per year. In sub-Saharan Africa, nearly a third of people are out of range of 3G connectivity compared with 2% for North Africa, which is an indicator of the challenge being faced. In order to get 1.1 billion people online, the report said there was a need for exceptional and coordinated efforts from governments, the private sector development partners and that the investment is worth it.

"Additional challenges, such as the lack of access to reliable and affordable electricity, make accelerating Africa's digital transformation journey even more difficult," the organisation stated. The report further mentioned that nearly 80% of all required investments are directly

related to the need to roll out and maintain broadband networks. About 20% of required investment consists in building the user skills and local content foundations, and another 2-4% should be allocated to setting up the regulatory framework.

NOVEMBER

Gabon and Congo signed a mobile roaming memorandum of understanding (MoU), with the agreement to be implemented before December 2019. Under the terms of the deal, subscribers would not be charged for incoming calls, up to a maximum of 300 minutes per subscriber a month. Outgoing calls would be billed at the local network operator's rates, while the higher of the two national rates would be applied for calls made to both countries.

The deal was agreed and signed by the heads of Gabon's Regulatory Agency for Electronic Communications and posts (L'Agence de Regulation des Communications Electroniques et des Postes, ARCEP) and the Republic of Congo's

Regulatory Agency for Electronic Communications and Post (L'Agence de Regulation des Postes et des Communications Electroniques, ARPCE.).

DECEMBER

In December the chief executive officer of MTN south Africa warned that the nation's economy could take a hit if troubled Cell C failed, as the former continues to be linked with acquiring its rival.

Speaking to South African financial newspaper Business Report, Godfrey Motsa said MTN would offer aid to its rival if there was a clear economic value to the move, highlighting the potential loss of thousands of direct and indirect jobs if Cell C collapsed. He also cited a broader ecosystem of suppliers along with the loss of taxes as examples.

If MTN did enter the race, it would go head-to-head with local rival Telkom and the world's biggest mobile operator, China mobile. Subsequently Cell C and MTN have after a long-negotiated agreement entered a roaming deal, thought by some to be the precursor of a merger of the two entities.

registration procedures backed by legislation. South Africa is an example of one that has had such requirements since 2002 and worldwide fewer countries each year come within the non-registration arena, such as the USA and UK but they have existing sophisticated levels of establishing the identity of a SIM user.

An announcement by the Manager for Corporate Communications at ZICTA (Zambia Information and Communications Technology Authority), Edward Mulenga informed all Mobile Network Operators (MNOs) that they would have to comply with proscribed standards for the registration of biometric details of mobile phone users. They will also be required to undertake regular verification processes and provide lists to ZICTA of all SIM cards that are deactivated. Failure to comply with the new regulations would attract punitive fines. MNOs will have to provide lists of SIM card dealers as well as lists of those who hold more than 10 SIM cards registered under the same identity card.



Stuart Kelly,
VP, market
development,
Bladon Micro
Turbine

During 2019, Bladon saw a number of factors starting to drive real innovation in the telecommunications industry, says Stuart Kelly, vice president market development. “The acceleration of the rollout of capacity and coverage of broadband networks, particularly to remote and rural sites across Africa, and a grow-

ing awareness of environmental responsibility, thanks in part to the ‘Greta’ effect,” he says.

Kelly adds that the rollout to rural and extra-rural parts of Africa “really gathered pace” through 2019, with governments increasingly focusing on the need to connect the unconnected. This is being driven by the huge demand for services such as mobile financial services and media. Meanwhile, some African countries are laying the foundations for 5G.

However, Kelly says this demand is happening alongside a growing need for sustainability to support this roll-out.

“Historically the premium placed on choosing the ‘cleaner’ fuel option to power telecoms equipment has tended not to make it cost-effective,” adds Kelly. “Penalties from government, regulators and investors in Africa have been almost non-existent, reducing incentives to pick cleaner fuels. Some of the more progressive countries in Africa however are hinting at providing incentives/penalties for deploying cleaner, low-carbon emitting solutions.”

In 2019 this started to change, adds Kelly, as actions by global firms such as Blackrock, which recently informed shareholders that sustainability would be at the heart of its investment agenda, have underlined the urgency around sustainability and this is coming to the forefront of policy for the telecoms infrastructure industry in Africa.

“Bladon’s fuel agnostic approach supports both these trends: our Micro Turbine Genset (MTG) is fuel agnostic and can operate on anything from lamp oil to clean biofuels,” Kelly continues. “This means that distributed

“Penalties from government, regulators and investors in Africa have been almost non-existent, reducing incentives to pick cleaner fuels”

power can be supported anywhere, with the fuel flexibility needed to support sustainable development in a cost-effective way. Marrying this quiet, clean engine with a combination of other innovations give some options and flexibility in how to deploy discrete, but reliable and cost-effective energy where it’s needed. These complementary energy solutions include supercapacitors, flow batteries, and Li-Ion cells as well as bifacial solar panels.”



Simon Pearson,
business
development
director,
World Telecom Labs

At the start of 2019, WTL invented a new term: Deliberate Digital Exclusion, which describes the millions of people who continue to be failed by traditional MNOs in Africa – and regulators,” says Leigh Smith, MD of World Telecom Labs (WTL). “However, thankfully we felt that during the year the tide was finally moving to



Johann Adjovi,
partner,
consulting,
Analysys Mason

The year ahead: Ethiopia’s telecoms market is opening up to outside investment, with interest from regional and global telecoms groups. However, prime minister Abiy Ahmed declared in June 2019 that Ethiopia will privatise and liberalise its economy to spur competition in several critical sectors, including telecommunications. The

World Bank is also supporting the government in Ethiopia with implementing these institutional reforms. The Ministry of Finance has recently clarified that the government will adopt the following strategies to liberalise the telecoms market and open it up to foreign investment.

- An independent regulatory authority will be set up to oversee the development of the telecoms sector in Ethiopia.
- Two new licences will be issued, for which foreign operators can bid.

- A significant (minority) stake of Ethiotel will be divested and made available for foreign investors to acquire.

Many regional and global telecoms group across the value chain (including operators such as Etisalat, MTN, Orange, Viettel and Vodafone) have already expressed an interest in bidding for these licences. This liberalisation of the telecoms market is expected to introduce competition to the market and help address the key challenges around high tariffs and low mobile SIM and broadband penetration.

The liberalisation of Myanmar’s underdeveloped telecoms sector could serve as a useful predictor of how successful similar changes will be in Ethiopia. When the government in Myanmar liberalised the telecoms sector in 2013, mobile SIM penetration accelerated from 10% to 99% and mobile broadband penetration increased from 3% to 67% within only 4 years. Liberalisation paved the way in Myanmar for reduced prices and increased mobile SIM penetration and

higher international bandwidth.

- Prior to liberalisation, the only operator in the country offered SIM cards for as high as US\$300. The entry of two new players reduced the price of a SIM card to just US\$1.50.
- Mobile broadband penetration also quickly rose from 3% in 2013 before liberalisation to 67% in 2017 after liberalisation.
- International connectivity increased significantly in Myanmar, from only one international gateway and a single international submarine cable prior to liberalisation, to six international gateways and three submarine cables after liberalisation.

Most of the major operator groups are likely to consider the investment opportunity in Ethiopia – either to acquire a stake in Ethio Telecom or to deploy greenfield operations. When assessing this opportunity, operators will need to carefully consider how the legal/regulatory environment is likely to change, as well as understand the demand characteristics and the other challenges of this market.

address the challenge of providing connectivity for everyone, regardless of where they live and work - and what their incomes are."

Smith says "there are now serious efforts being made to address the challenges of build and maintain commercially sustainable networks" in rural areas including significant announcements from MTN, Orange and Vodafone". There were challenges in 2019 and to help address Deliberate Digital Exclusion, WTL has been championing the national roaming model for several years with regulators, government ministers and other influencers. This has a two-part approach: it advocates the allocation of dedicated spectrum by the Regulator specifically for rural coverage - and the building of new open wholesale networks in rural areas where there is little or no coverage at the moment.

"The removal of the CAPEX cost of building a rural network will enable regulators to pressure previously reluctant operators to start offering services in these areas," adds Smith. "Indeed pressure might not even be needed. For-profit telcos are naturally competitive beasts and will not want to see their rivals scooping up rural customers. Pricing and customer service will, as ever, be the key differentiators.

We have also been lobbying regulators to allow open access to all existing Government-owned or sponsored telecom infrastructure."

So, what's the big push for WTL?

"We really need different operating models, different licensing and different funding sources emerging alongside regulators and MNOs with the political and commercial commitment that is needed to move forward in building rural networks," says Smith. "We will be working with all of our friends and contacts across the African ecosystem to achieve this."

He says the company is essentially pushing hard to provide low-cost, low-power small cells that can be deployed easily in remote locations. "An innovative approach we have taken is to offer our Vivada C3 rural communication hub," Smith says this changes the model by not trying to cover the whole rural landscape - which may be very expensive for minimal reward - but offers a central point for the local population to access voice, data and power provision."

Although the company has particularly focused on the ongoing monthly operating costs of a site, it also thinks that greater attention has to be given to the revenue side of the equation. "That is why we have included elements like cyber cafés, money transfer and pre-paid payphones in our rural solutions." However, Smith says WTL does not presume that phone calls and browsing from handsets will be enough on its own to make the business case sustainable.



Alp Uysal,
VP, strategy,
technology,
innovation and GIR
market area MEA,
Ericsson

Delivering the full 5G experience will involve enhancing many existing use cases and creating new ones that cannot be fulfilled using current technologies, according to Alp Uysal, vice president, strategy, technology, innovation and GIR market area Middle East and Africa.

He says decisions on where, when and how operators deploy 5G are not only driven by commercial considerations but also on the availability of spectrum, network equipment and devices. Furthermore, he says development of expert human capacity to innovate on services and creation of awareness in the consumer domain to new and innovative services should be undertaken by the 5G eco-system stakeholders.

"Internet of Things (IoT) and 5G have incredible potential to add new value for operators in the digital era. IoT will provide the means for delivering innovative solutions to meet the socioeconomic challenges and will transform businesses to enable more growth in Africa," he says. "Smart City solutions, such as using IoT to curtail water scarcity in large informal settlements, to intelligent transport solutions, are increasingly being investigated to find answers to the challenge of urbanisation."

Uysal points to the fact the first 5G devices were pocket routers and the first 5G smartphones have launched in 2019 in line with the first commercial 5G service launches in many parts of the world. "Despite challenging 5G timelines, device suppliers are expected to be ready with different band and architecture support in a range of devices given the device availability, over 10 million 5G subscriptions are projected worldwide by the end of 2019, and more substantial volumes of 5G devices in different bands are expected from 2020 onwards," he adds.

On the other hand, Uysal says modern mobile networks need a variety of spectrum with different frequencies providing different key components. "We expect that 5G will need a mix of low, medium and high frequency spectrum, some of which will be 'new' spectrum and some will be 're-farmed' spectrum, previously used by other services or even shared with existing services," he continues. "Ericsson proposes spectrum sharing as one of the techniques for improving spectrum availability in the realm of 5G."

Uysal is also of the belief that goals set by countries, though sometimes ambitious, varies and there is little basis for the sector to determine where the opportunities for

"Ericsson proposes spectrum sharing as one of the techniques for improving spectrum availability in the realm of 5G"

greater effectiveness lies and where efforts should be focused. The enabling capacity of ICT is expected to make a great contribution to areas such as mining and agriculture, which resonate with the African economy and African enterprises. These areas, he says, are interesting for us to look at.

"Current 4G cellular systems provide a high level of security and trustworthiness for users and operators. Second generation (GSM) systems were the first to have standardized, built-in security functions, which then evolved through 3G and now 4G networks," says Uysal. "Moving on, the evolution of LTE is a vital part of 5G. Building the inherently secure 5G system requires a holistic effort, rather than focusing on individual parts in isolation. This is why several organisations have worked together to jointly develop the 5G system, each focusing on specific parts."

Uysal says these enhancements come in terms of a flexible authentication framework in 5G, allowing the use of different types of credentials besides the SIM cards; enhanced subscriber privacy features putting an end to the IMSI catcher threat; additional higher protocol layer security mechanisms to protect the new service-based interfaces; and integrity protection of user data over the air interface.



Aji Ed,
chief technology
officer,
Nokia Middle
East and Africa

Last year was an interesting year for Nokia and for the whole telecommunications industry thanks to 5G, says Aji Ed, chief technology officer, Nokia Middle East and Africa. Ed says the new technology was the compass for almost all discussions, engagements, and demonstrations throughout the year. Nokia ended the year with 62 5G commercial contracts and 18 live 5G networks worldwide.

"Despite all the challenges, Africa is not far from the action," says Ed. "Telcos have been very excited to study the new world of opportunities brought by 5G and Nokia has played a leading role in consulting its customers to support them in defining their strategies for the coming years."

Nokia also has achieved many successes

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across Africa in different technology domains by securing several key deals from customers to modernize and expand their networks with the latest Nokia technologies including the Nokia AirScale portfolio which paves the road to 5G.

He says the continent hosted several interesting events demonstrating new technology innovations and telecom regulators across the continent were also very active in 2019, playing a key role in planning for the future. "The message was clear: 5G is definitely on the horizon for Africa, in spite of all the challenges," says Ed.

Penetration of 4G in Africa is still a challenge due to low ARPU and weak penetration of 4G devices. However, different forecasts show big leaps in smart handset volumes and data consumption rates in many locations around Africa. "We believe this will be a good engine for telco revenues and will urge them to think about 4G/4G+ strategies for the upcoming years," Ed adds.

Rural coverage remains a big challenge, despite it being a social responsibility. Hundreds of millions of people remain unconnected in Africa. Ed says expanding coverage is a game changer to those unconnected communities and that it has been proven that ubiquitous connectivity stimulates economic growth and it will remain a key priority to ensure that these communities are connected.

"Nokia continues to support its partners in Africa to overcome those challenges," Ed continues. "Not only by providing the latest technology and end-to-end solutions in the telecom domain but also by playing the consultative role while sharing awareness and best practices to identify the best fitting solutions."

As far as 2020 is concerned, Ed says it will be an important year for telecommunications globally. "We are waiting for more 5G networks to go live and more traction for 5G with new use cases exploiting 5G end-to-end architecture," he says. "The 5G Standalone model, SA, would come to life giving more potential to the new technology."

He says 5G does not mean to focus on data connectivity for handsets only like it was the case before but is all about machine communication now. Ed adds that going forward, 5G is going to revolutionize manufacturing again, what we call "the 4th industrial revolution".

Elsewhere, TD-LTE continues to grow in Africa and with Massive MIMO provides a magical solution to enhance radio network coverage & capacity. "It also paves the road for 5G," Ed says. "We have seen that Africa refuses to be left behind when it comes to adopting to new technology and exploring new 5G use cases. We have seen the progress achieved in South Africa and we expect more to come in 2020 and beyond. The most important aspect is to proceed with the discussions to reach answers for those vital questions such as how to benefit from 5G, what the right time to market is, which spectrum should be used and, most impor-

tantly, what the use cases are."

Looking to the future, Ed says standardisation of technologies will continue through 2020 and that 3GPP Release 15 has been a key milestone, yet the upcoming releases will bring a bright future with new bands, ultra-reliable low latency communication URLLC, software defined networks (SDN), network slicing and more.

"Nokia expects a lot of dynamics in Africa with more progress towards higher data throughputs, end user experience and coverage expansions across the continent to reach the uncovered communities," says Ed. "African telecom operators still need to invest in these vital domains while keeping an eye on the future. We should be looking to define the bold lines of the digital transformation strategy. The classic model of a CSP must be transformed into DSP, Digital Services Provider, with a wide focus on services & content delivery."

One final point Ed makes is that "we can expect the rise of new models like private 4G/5G networks for different purposes" and exploiting different bands. "It's machine communications, and Artificial Intelligence, AI, that will play a key role in the transformation of other vertical sectors such as manufacturing, health, and transportation," he says.



Miriam Tuerk,
co-founder, CEO,
Clear Blue
Technologies

// The marketplace changed radically when everything went from landline to wireless," says Miriam Tuerk, co-founder and CEO, Clear Blue Technologies. "In Africa everyone has wireless capability. In Toronto when I was a kid we had one phone and now I have two kids we have four phones. So wireless unlocked and changed the world and brought the internet to us. As you look at what's happening in the marketplace today, the last cable that has to be connected to all of these sites is a power cable and that is connecting to grid that's very expensive and doesn't work well. So, what we have focussed on is 'wireless power for wireless operators' that's our tagline. Bringing off-grid power solutions to the marketplace."

She says there's a lot read about people using diesel generators, which cost a lot of money, but Clear Blue is 100% solar. "Solar is lights out, no maintenance, nobody has to go to the site – it's a complete remotely operated service," she adds. "All the power electronics at the site is our technology, then we add solar panels and batteries. Our secret sauce is that we tie that to data analytics and predictive energy and weather forecasting."

Tuerk gives an example of how the company helps African nations. "What we do is we're able to run the system in a way where instead of it going off after no sun for a few days, we control

it so it's turned off from say 1am-5am," she continues. "We make smart off-grid systems for telecom, wireless, Wi-Fi. No other vendor in the world does what we do. We provide a complete standalone system and so low-cost, reliable, high up-time, long-life and green."

Indeed, she uses Tesla as the paragon, a huge company and it has key things that make it a viable.

"If I buy a Tesla I will get 400km on a charge and the battery is going to last me at least 10 years," she says. "If it turned out that I only got 50km on that charge and I had to replace the battery after 18 months, the dog wouldn't hunt. Tesla wouldn't exist. That is the experience of telco operators in Africa. When they put in solar systems today, they think they're going to have X up time and performance, that the battery is going to last between five and 10 years. What they're finding is they get no up time. We're doing a project now for large provider where we're replacing their existing system because after 12 months it's dead."



Eric Mujera,
sales director,
Syniverse

Eric Mujera, sales director at Syniverse who is overseeing the business in Africa, says 2019 in summary was a relatively good year for the company. That's despite the tough economic challenges in some parts of the region coupled with risks associated with the foreign currency, political and regulatory compliance, most of its customers experienced growth, which in turn worked positively in our favour. "I can sum up 2019 as our year of sowing new seeds in the market by introducing new possibilities like policy management, blockchain enabled clearing, RCS and fraud management solutions, and we anticipate 2020 will be our year of reaping from these initiatives," he says. "The high was that our market experienced increase in mobile subscribers, voice and data traffic and growth in volume of roaming traffic – which was a plus for us. The low was the speed of adoption and therefore finalisation of contracts has slowed. This is due to 2019 seeing a reduction of some clients' budget in this area, which means investing in new solutions is higher risk for them and therefore, in some cases, perceived as daunting."

With regards to trends, he points to business process automation, RCS and increased traffic roaming.

"In 2019 we saw an increased demand from our customers and potential customers who saw the need to automate their internal processes – especially within the roaming departments," Mujera continues. "Ideally they want a shift from complicated manual spreadsheets, that takes days to decipher, analyse and get detailed reports, to real-time data which allows them to make quick

decisions. This presented an interesting challenge and opportunity as it pushed us to think out of the box to address this emerging need."

He says RCS is now moving from a buzz word in the African telecom space in board rooms and increasingly getting into the board and senior leadership implementation roadmaps, we saw a significant interest from the market. In addition, a significant increase in roaming traffic came especially fuelled by IoT use cases.

Mujera's thoughts on 2020? "There's expected to be a big push around blockchain enabled clearing and settlement use cases that will transform the industry in alignment with the New GSMA BCE standards," he says. "Pushing through RCS and growing more in the enterprise space with our suite of messaging solutions."



Ahmad Sayed,
regional director,
Middle East and
Africa,
Nexign

Last year was a massive year for Nexign, when the Russian-based business support system (BSS) had its first full year covering Africa.

Nexign, Ahmad Sayed as regional director, Middle East and Africa, who runs the operation from Dubai, says setting up a new team and strategy for the market over the 12 months has kept him and his team busy.

"As soon as you land in a new territory, there is a lot of expectation from the shareholders," he says. "It's a critical first 12-18 months, when you start to see how the market is reacting, what the opportunities are for you etc."

Sayed and his team have been busy with business development, which requires travelling the length and breadth of the continent.

"This has been encouraging to see that there is huge potential for us as we present the company and meet new customers," he continues. "We have also anticipated a number of roadshows, forums and exhibitions and that has given us lots of leads and lots of new ideas where to reach and touch the first low-hanging fruits.

Of course, in any business, priorities have to be made and Sayed says the African market has been a positive experience to date.

"Usually in new markets, the first thing you

"The market had been a bit stagnant in the last few years but due to 5G coming, there is huge spending and growth expected in the next year"

do to explore," he says. "In Africa we have done much more than that. Opportunities are lining up and we are starting to choose and participate."

Still, there are differences dealing with northern and sub-Saharan Africa (SSA).

"Broadband connectivity in the north is much stronger than in SA because of fibre to home," he says. "In SSA more people are dependent on wireless connectivity as there is very little fibre connectivity. This has given the edge to the north."

So, what are Nexign's plans in 2020 and beyond?

"We need to close a number of opportunities where we have been developing in the last 12 months," says Sayed. "The market had been a bit stagnant in the last few years but due to 5G coming, there is huge spending and growth expected in the next year and surely we as Nexign, as an experienced BSS vendor, with the support of our group holding and the companies in it, will help us take a good share from the market."



Femi Oshiga,
VP, service
providers of the
Middle East and
Africa,
CommScope

// There's still several network operators who are investing increasingly in 4G, so that obviously presents an investment opportunity for us in terms of sending out tenders," says vice president of service providers of the Middle East and Africa, Femi Oshiga, CommScope. Also, they want to fiberise the backhaul. Then because of the localisation of traffic, they're investing increasingly in in-building and venues, so we also have an opportunity there. We've done fairly well in exploiting in-building solutions."

CommScope works with almost every network operator across the Middle East and Africa and when it comes to 5G, Oshiga says it has gone from the over-exuberance to the reality of what it means in truth. "That realisation has been good for us," he continues. "We've gone from fancy technology, active solutions and only a few companies can do it to now there's a whole suite of solutions possible to help these services. For example, in relation to antennas – they are something the vendors want to push. However, that's only going to address up to 12% of the sites. For the rest there are passive antennas that CommScope leads the market in."

Oshiga says the mergers and acquisitions in the sector have yielded mixed results.

"Some of them have been good, but for us some have resulted in a slow down until decisions are made in the future," he adds. "There are some big tenders in the market as operators try to push volumes and look at it as a group of sales. MTN is looking to purchase as a group, Airtel is another interesting one and Orange has made a lot of

announcements and pushing its subsidiaries a lot."

So, what of 2020? "Operators need to continue to increase their investments around fibre," he says. "They have to backhaul all these sites with fibre, so that represents an opportunity for us as we have a strong portfolio that addresses these immediate and specific needs. The other is continued investment in 4G, site modernisations, base station antennas. If we see continued and steady growth in in-building solutions that would be a positive."

Oshiga opines that 5G will be very localised but it has the potential to replace fixed wireless or really provide an alternative to fibre to the home in many areas. "I actually think it won't be ubiquitous but in those areas you'd find a pretty decent pick up rate," he continues. "I remember hearing about WhatsApp in Nigeria before I did in the Gulf countries – because there was a real need. I think you'll see that kind of shift with 5G. It won't go with ARPU and wealth, it's going to go where there is demand, use cases."



Wu Jianjun,
marketing
director in Africa,
ZTE Corporation

Mobile and internet penetration in Africa has been growing rapidly over the past few years. Communication technologies and services have been responsible for a high percentage of economic growth throughout the region (~11% in 2019) and as

the supplier to over 140 operators across Africa, ZTE is an active participant in this. The enhanced connectivity of these networks has also been hugely important in improving the development of education, health, agriculture and much more. Our dedication to sustainable development in all areas of our business in Africa has been a driving force behind what we achieved in 2019 and our plans for the region moving forward.

2019 was a relatively good year for ZTE in the Middle East and Africa region, which was focused on improving customer satisfaction, industry recognition, employee engagement and judicious compliance throughout our African branches.

To this end, we continued to deepen cooperation with operators and achieved breakthroughs in multiple countries in the African region, focusing on valued customers in key countries to ensure increase in market shares. In the field of 5G, we have signed 5G contracts with the South African, Nigerian and Ugandan branches of the MTN, and co-hosted multiple 5G use-case demonstrations and conferences in these three countries.

In other areas, we have achieved in-depth

“With many African countries being currently under lockdown, we have seen a dramatic increase on the network load due to people staying at home”

operations in high-quality networks with our wireless products throughout the region. MTN South Africa and ZTE have jointly won the first P3 test in the region for four consecutive years and ZTE’s cloud & core product has already been widely applied by Airtel and Orange, marking a breakthrough in MTN. And for transport wireline access, ZTE has maintained long-term cooperation with mainstream customers in Africa, helping these countries achieve broadband speedup, including telecom customers in Egypt, Ethiopia, Algeria and Morocco.

In terms of innovation and research, ZTE has opened three innovation training centres in South Africa, Ethiopia, and Saudi Arabia – two further centres are currently under construction in Egypt and Algeria.

Looking ahead to 2020, it would be remiss of us not to mention the ongoing and evolving situation around COVID-19. With many African countries being currently under lockdown, we have seen a dramatic increase on the network load due to people staying at home. Our team is fully focused on providing the best quality of network possible and has already proposed technical analysis and solutions to quickly ease these capacity issues. Throughout the duration of this global pandemic, we are determined to secure our network service for all our customers and users in Africa to minimize any disruption to people’s lives.

There are other areas also in which ZTE plans to make advancements in the coming year. Despite a high growth in connectivity penetration in Africa, the level is still far behind other regions such as Europe and Asia. Issues around coverage – particularly in rural areas – need to be resolved quickly in order to ensure that the 33% of the region that doesn’t yet enjoy the benefits of connectivity can do so in a fast, easy and economical way. Additionally, more needs to be done to ensure that the areas of the region that are already more developed are equipped with the most cutting-edge technologies such as 5G, IoT and AI to diversify their revenue streams and fulfil their various end-users needs.

This year will be an important year for development in the region and we are keen to continue to closely engage with telecoms operators in the Middle East and North Africa who we are already in talks with to launch further 5G projects across the region.



Albrecht von der Recke,
founder & COO,
fonYou

Almost a third of adults across the world don’t have a basic transaction account. However, two-thirds of the world’s population have a unique mobile subscription, creating an opportunity for mobile operators to bring financial inclusion to these millions of unbanked citizens. Operators have access to a goldmine of personal and usage data on each of their subscribers, which they can tap into and use as a means of generating revenue.

Alternative credit data such as utility bills or mobile payment history can provide insight into a consumer’s risk profile. By providing third-party financial services providers with access to this information, operators open the door to a plethora of new digital and financial services that benefit all their subscribers – not just a privileged few.

Some operators already use artificial intelligence (AI) to mine customer data in real time in order to check whether a subscriber qualifies for a microloan. For example, a prepaid customer may run out of credit overnight when buying an over-the-counter top-up is impractical. Whether the customer has a bank account or not, by assessing their usage and payment history data the operator can offer a personalized microloan that gives the customer continuity of service and keeps them connected.

Applying advanced AI-led analytics to this data provides operators with even deeper insight into the behaviour of subscribers. Algorithms, rules and conditions can be used to calculate a customer’s propensity to repay a loan. Such alternative credit data can benefit subscribers in other aspects of their lives because the inclusion of mobile phone payment history has a positive effect on overall credit scores.

Applying alternative credit data to the issue of financial inclusion requires an “open telco” environment, in which mobile operators provide financial services providers and associated third parties with secure access to subscribers’ credit score information via dedicated application programming interfaces (APIs). Such an environment collectively unlocks a range of new digital financial services that can be accessed by anyone, whether banked or unbanked. Delivering this valuable insight and intelligence in real time enables lenders to make decisions on loan applications almost

instantaneously, either face-to-face, online or via mobile. And by establishing themselves as credit brokers, operators themselves open up new revenue streams.



Salman Tariq,
manager, Middle
East and Africa
region,
Optiva

Africa is rising — it is large, diverse, and presents amazing growth potential for information and communications technology (ICT) companies. Across the region, we are seeing improvements in connectivity and the fibre landscape, as well as increasing focus on the cloud as communication service providers (CSPs) evolve their digital transformation journey.

While public cloud data centers are currently very limited to non-existent, the big public cloud players have robust and low-latency private fiber networks that could be accessed through multiple points of presence across the region, offering the benefits of scale, availability and advanced technology. Africa understands now that we live in an open-source world, and public cloud technologies present an amazing platform to build on for the future.

In fact, forward-thinking CSPs are pushing the boundaries of traditional technology to find new ways that Africa can leverage and ride the tide of investments by major public cloud players, transforming their business by moving from traditional, on-premise BSS systems to a more agile and cost-efficient business model.

In the past, data privacy and regulation has been an issue in the region. While some of it was more about control — or letting go of it — there were some issues related to trusting the data security safeguards in place in the public cloud as well. However, security measures in the public cloud have evolved tremendously over the last few years. In fact, prominent industry analysts such as Gartner are predicting that public cloud will suffer fewer security breaches than on-prem data centers in 2020, and with that, privacy will be better managed on the public cloud. The rise of privacy regulations like GDPR also has helped to reduce subjective interpretations, alleviating concerns around data privacy.

On the other hand, the pace of innovation in the region is still being hindered by the issue of data locality, restricting certain types of customer data from leaving a geographical boundary. In a world where connected users don’t think twice about signing license agreements that allow internet giants access to their private information, data locality does not make a lot of sense. If consumers trust these companies, one would expect



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that organizations defining these locality regulations would do the same.

At Optiva, we believe in leveraging the fast-paced innovation in the public cloud space and using that to build superior products. A business model that aligns spend exactly where it is needed is a game changer — and it's only possible with a cloud-native product on the public cloud.

Indeed, Africa is rising, and so is the disruptive effect of the public cloud in the telecom space. It is time to embrace this innovation, and it is time to think big.



Kostas Kastanis,
deputy CEO,
Upstream

It's not difficult to quantify the worldwide impact of the Internet: enterprises instantly create a global marketplace for goods and services; online education reaches learners from primary schools to universities and beyond; knowledge and insight from millions of sources is immediately searchable and influences every aspect of our daily lives and lifestyles; and vertical markets like healthcare, finance, travel and entertainment continually create new services for consumers and enterprises.

Given the massive impact that the Internet has on our lives, it's difficult to reconcile the fact that 41 percent of the world's population lacks access to the Internet. The majority of people who can't access the Internet are from developing economies, where lack of Internet connectivity stymies economic opportunities, limits access to important news and stifles communication.

Moreover, hundreds of millions of people lose Internet access when financial limitations and physical restrictions limit their ability to top off data when they run out. Increasingly, these factors are leading governments and enterprises to view Internet access as a basic human right.

The disparity in Internet access creates an opportunity for mobile operators to provide an ad-funded free mobile Internet platform that ensures subscribers have a connection to the digital world even when they run out of credit. The platform provides essential Internet services, including basic information about local and international news, as well as the ability to search the web.

For mobile operators, the benefits of an ad-funded free mobile Internet platform are two-fold: The service answers a critical subscriber need for Internet coverage, while also initiating a new revenue opportunity for operators. Within the portal, subscribers are given the option of digitally topping up their service for increased airtime or data.

South Africa's largest mobile operator, recently instituted ad-funded free Internet, and in doing

so now provides Internet access to 25 million mobile users in South Africa. Already, 55 percent of the operator's subscriber base engages with the portal. Subscribers that run out of data are automatically redirected to the portal, keeping them connected. At the same time the operator improves the user experience, engagement and satisfaction, enhancing their brand perception. Funded via advertising the platform solution, behind the free captive portal, unlocks new revenue streams through ads and stimulates the adoption of digital services.

Mobile operators worldwide can emulate this example to provide uninterrupted access to the Internet and ensure millions of people have access to this basic human right via a solution that at the same time supports the digital transformation of operators.



Shanks Kulam,
co-founder,
x-Mobility

// We work with African MNOs, MVNOs and brands to help them launch their MVNO or AppVNO offering," says Shanks Kulam, Co-Founder of x-Mobility. "We are especially working with a number of travel brands and MNOs looking to target their diaspora."

The company's AppVNO – an app-based MVNO service – allows users "to be local" when travelling to the likes of the UK, France, the rest of Europe or even the US. Users subscribe to a local mobile number which also gives them the ability to make super low cost calls and texts back home.

"Both our traditional SIM-based MVNO model and our AppVNO service allow African MNOs and brands to create international revenues outside of Africa, something that excites a lot of the people we're talking to," Kulam adds.

He says what the company has seen in particular is just how agile African brands and MNOs are when it comes to the next generation, digital mobile services.

"This can be seen with the success of strong consumer brands, such as banks (e.g. FNB, Equity Bank) launching their own MVNOs and quickly acquiring millions of users," Kulam continues. "Alongside that, there was also the recent 'pivot' of the South African MNO CellC looking to become an MVNO itself."

Kulam says x-Mobility has been "very engaged" with MNOs, MVNOs and consumer brands across Africa to develop a new digital first MVNO approach with our AppVNO OTT service. "We feel like we're riding the crest of an ever larger movement for African brands to scale outside their home territories to win international revenues – be that via launching as an international MVNO or digitally via the

AppVNO offering," he adds.

Looking ahead to 2020, Kulam says his company sees a continuation of this trend, more launches and further execution scale as more and more Africans travel and more of the African diaspora have the ability to connect with their home brands via the likes of an AppVNO offering.



Mahmoud Oubraham,
sales director,
Middle East and
Africa,
EXFO

EXFO'S main priorities for Africa in 2019 were to support operators bringing the latest technologies in the most advanced countries but also to equip the operators in emerging areas with solutions to maximize the ROI on their network, according to Mahmoud Oubraham, sales director – Middle East Africa. To make it concrete, the company deployed, as an example, solutions addressing where would be the best spots for 5G early adopters or 4G next roll-out, how to prepare a network to automation and virtualisation by being able to have a real-time automated topology, from physical to logical layers, which subscribers are impacted by a network issue. "As another example of advanced technology, we supported securing the massive deployment of fiber over the continent including super high-speed backhauls which would be competitive worldwide," says Oubraham.

On the other side of the operators spectrum, EXFO helped customers define which sites are the most relevant for revenue catch-up when it comes to outage management. "In other words, for which sites is it worth better securing the energy supply to maximize revenue and reduce churn," continues says Oubraham. "As another example, we helped operators looking for niches to increase data revenue from the same subscribers' base with more relevant offering."

Although he has already named some highlights, Oubraham says that "the main one for us is to see that we are relevant to the continental market with its specificities".

As for the main struggle, EXFO sees the gap widening in certain areas of the continent vs the rest of the world. "Technology is Capex-intensive and that's hard to follow for Operators which are mainly on prepaid markets," says Oubraham. "Data is the huge revenue driver for majority of the Telecom word and we see that prepaid markets with low ARPU can hardly follow on the investments needed, as revenue to be spent is limited per capita. Video is increasing the gap there and makes the market addressable for

“We expect automation and AI to help us reduce further outages, understand better the network development needs according to subscribers usage and profiles”

satellite telecom players.”

As far as 2020 is concerned, Oubraham says the main focus is to be even more relevant to the continent, although there is a big discrepancy to be relevant to different country profiles. “So we aim to continue bringing the latest technology in a way which is relevant to our customers’ ROI, while being profitable ourselves,” he says. “We expect automation and AI to help us reduce further outages, understand better the network development needs according to subscribers usage and profiles. It is not anymore about selling an additional tool or add a source of data, it is now more about how to combine smartly all the data gathered to have relevant outcomes making an impact on operators revenue and churn.”

Oubraham says the second important focus will be on remotely securing the fibre network and its quality. “You can send a technician out in the city to check on a detected issue,” he adds. “If you need several hours to do so, you better do it remotely to save money, time, increase security but also massively decrease the time to detect and time to fix.”



Sebastien Codeville,
CEO,
KaiOS
Technologies

// The importance of offering affordable yet capable mobile devices and enriching the content ecosystem were key focuses for us in 2019, as we explored opportunities to grow in new, underserved markets,” says Sebastien Codeville, CEO of KaiOS Technologies, which has developed the mobile operating system KaiOS which

powers a new category of devices known as smart feature phones. “This meant developing regional partnerships that allowed us to expand into several new African countries, connecting previously isolated people to the internet for the first time through incredibly affordable smart feature phones, and encouraging users to go online with improved mobile resources and a better on-boarding

experience. Due to increased accessibility and awareness, we saw adoption rates of smart feature phones increase, which will lessen the digital divide in key African markets.”

Codeville says that in Africa, consumers in the entry-level segment of the market continue to push for devices that are simultaneously more affordable and capable. He adds that many of these consumers have been excluded from the digital revolution due to the high cost of entry-level smartphones, along with expensive data and a lack of digital literacy. “To combat this we’re working to expand the number of countries in which people have access to smart feature phones, while fostering a local developer community in Africa through workshops and events, which will ensure content is localized and relevant to this new user base,” he continues. “Additionally, we’ve partnered with coding schools to further facilitate the next generation of mobile developers in the region.”

KaiOS, Codeville says, was particularly excited to forge several new partnerships in Africa with brands including Vodacom, TECNO, Tigo and Africell, which introduced accessible smart feature phones to more than a dozen new countries in the region. The company was also honoured to win the Changing Lives Award at AfricaCom, and to be named one of TIME Magazine’s Best Inventions of 2019, in the social good category.

“Last year, we brought our in-house educational app, Life, to Africa, and in 2020 we’re looking to expand its reach to even more countries across the continent and other regions around the world,” Codeville says. “Education inequality is a major consequence of the digital divide, and by connecting people to the internet we intend to connect them to free, high-quality educational resources. We’re excited to continue expanding KaiOS’ global presence, and connect millions more people to invaluable digital resources for the first time through smart feature phones. Moving forward we’ll continue to partner with more content providers to ensure trusted, user-first digital resources created specifically for KaiOS users.”

Many analysts and tech firms have made predictions for 2020 and KaiOS is no different.

“We see the demand for smartphone-level features like popular apps and higher levels of connectivity continuing to grow, with consumers searching for that elevated digital experience in a more cost-effective package in emerging markets,” says Codeville. “New categories of digital content, along with new form factors, will emerge to address this demand.

In addition, there is a growing trend of minimalistic companion devices in developed countries, both for specific applications (back-up phone, construction, outdoors) and as a break

from the ultra-connectivity of smartphones.”

He believes the idea of a “Digital Detox” will continue to grow in popularity, as people increasingly see the value in reducing their contact with, or dependency on, smartphones and various forms of digital communication that can distract from their daily lives.

“Finally, the capabilities, and thus importance, of digital assistants continues to expand. Consumers use them increasingly to not only ask basic questions, but control other devices and complete a range of tasks on their phones,” Codeville adds. “This development streamlines the user experience for smartphone users, but also more importantly enables first-time users to complete previously complex tasks without any prior knowledge of, or experience with, digital devices.” ■

“Education inequality is a major consequence of the digital divide, and by connecting people to the internet we intend to connect them to free, high-quality educational resources”