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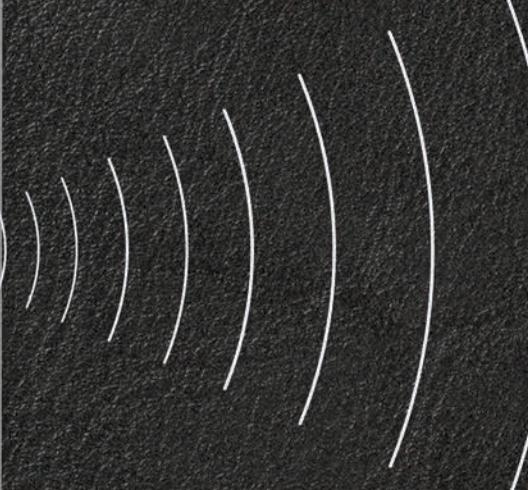
COMMUNICATIONS

NOVEMBER/DECEMBER 2017

Volume 22

Number 4

- The IoT and getting on top of smart cities
- Connecting users in the health sector
- Industry 4.0: welcome to the fourth industrial revolution



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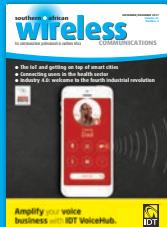
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# Zambia plans to grow market with new mobile licenses

Zambia plans to issue new network licenses following revised telecom laws approved earlier this year to enable more voice service providers in the country.

In an RFP published in late September, the Zambia Information and Communications Technology Authority (ZICTA) invited applications for international network and national service licenses.

It said that the international network license will authorise the holder to install and commission gateway facilities such as an Earth station, VSAT/hub, switching centres, nodes and servers.



Communications minister Brian Mushimba says the country needed to attract investors and create more jobs.

Meanwhile, the national service licensee will be permitted to provide services such as voice, messaging, internet, VoIP, VAS, tracking, amongst others.

Mobile spectrum will be available in: 900MHz (8MHz, FDD); 1800MHz (10MHz, FDD; 2600MHz

(30MHz, TDD); and 2300MHz (30MHz TDD). Fixed service spectrum will be in 5GHz, lower 6GHz, 11GHz and 18GHz.

The deadline for application submissions is 24 November 2017, while spectrum prices are calculated in ZICTA's revised Statutory Instruments document issued in June (*SI 48*).

The move finally paves the way for a fourth mobile operator in Zambia. In 2009, the government restricted the number of mobile voice operators in the country in order to help grow the existing companies – MTN, Airtel and state-owned Zamtel. Mobile

Broadband Zambia (Vodafone Zambia) entered the market last year but only as a data service provider. According to ZICTA, more than 12 million of the country's 16 million people are now mobile subscribers which means penetration of almost 75 per cent.

In September, Zambian communications minister Brian Mushimba reportedly told parliament that the country now needed to get rid of restrictive laws to attract investors and create more jobs. He said a new operator could be in place over the next six to 12 months and that there may even be room for a fifth operator.

## AU says continent's weak data ecosystem is preventing development tracking

More than half of the UN's' sustainable development goals (SDGs) cannot be tracked in Africa due to data constraints, according to a new study released in mid-October.

The '2017 Africa Sustainable Development Report: Tracking Progress on Agenda 2063 and the Sustainable Development Goals' was jointly published by the African Union Commission, African Development Bank, the UN Economic Commission for Africa (ECA), and the UN Development Programme. It is said to be the first comprehensive appraisal of its kind since the adoption of the SDGs and Africa's own Agenda 2030 and Agenda 2063 targets.

The report said that the continent needs to sustain efforts to eradicate extreme poverty and gender inequality and also improve its statistical capabilities to implement and track progress towards these objectives.

The study calls upon African nations to "harness the data revolution and upgrade the continent's statistical capabilities". It says they should address the gap in the region's data collection capacities, as these are seen as "critical" for the evidence-based policy-making and tracking of progress towards the goals and targets stated in *Agenda 2030* and *63*.

"Six out of every 10 SDG indicators cannot be tracked in

Africa due to data constraints," says ECA executive director Vera Songwe. "Strengthening our data ecosystem is therefore imperative not only for performance tracking but for informed policy-making."

The report estimates that USD1bn is needed annually to allow 77 of the world's lowest income countries to establish reliable statistical systems that are capable of measuring and sustaining SDGs. It adds: "The increasing demand for data and statistics under the 2030 Agenda and *Agenda 2063* is an opportunity for Africa to embark on the data revolution in order to improve statistical capacity in all domains."

## MTN sees some churn

MTN saw a slight fall across its group-wide users with a QoQ decline of 0.7 per cent. Total connections for 3Q17 are reported as 230,228,000.

The drop was largely driven by lower reported users in Nigeria, as well as the disconnection of around 750,000 customers in Uganda as a result of regulatory SIM registration requirements.

Subscribers in South Africa decreased by one per cent to 30.9m. MTN says the country was impacted by a 1.3 per cent decline in the pre-paid segment which was mainly the result of higher churn following the withdrawal of a 2Q17 promotion. Post-paid user numbers were "stable".

## Cloud-based learning enhances education in South Africa

Software specialist D2L claims its cloud-based learning platform, *Brightspace*, is enhancing education for more people across the EMEA region including South Africa where AFRICOLLEGES International (ACI) is now using the system.

ACI is an online college addressing the agricultural education gap in South Africa. It is introducing *Brightspace* to provide students with affordable, accessible and industry-relevant agricultural course content.

College founder and CEO Howard Blight says: "For the very first time, *Brightspace* will give our students here on the African continent the opportunity to study from anywhere, at any time, whether it's on their mobile, desktop or tablet. This provides a dynamic learning environment without the added costs of being 'on campus.' It will enable ACI to accommodate those students that may not have the financial resources associated with traditional learning models."

AFRICOLLEGES founder Howard Blight says *Brightspace* will help support students who may not be able to afford traditional learning paths.



personalised learning in a classroom or anywhere online. It's claimed to make designing courses, creating content and grading assignments easier, and also features analytics that track and deliver insights into the performance of departments, teaching programmes or individuals.

EMEA business management consultancy Visions Consulting has also partnered with D2L in South Africa, in an effort to modernise its enterprise customers' learning experiences.

## MTC tower collapses

 Following the collapse of the Leonardville tower on 30 September 2017, Namibian cellco MTC announced five days later that it had put up a temporary mobile site and that full GSM services had been restored for the town and its surrounding areas. It said the replacement site would continue to serve local subscribers whilst reconstruction of the fallen base transmitter station was ongoing. The operator did not offer a timescale for this or any reason as to why the tower had collapsed in the first place.

## Two million for Zamtel

 In mid-August, Zambian telco Zamtel said that it "continued to batter all growth barriers" as it announced that it had now reached two million subscribers. Acting CEO Sydney Mupeta said the company had recorded consistent growth since May when it became profitable for the first time in 2017. He said this was due to "prudent resource utilisation and exciting product offers". Mupeta added that Zamtel will continue to invest in its fixed and mobile business segments, and "remains focused on pushing growth barriers out of the way."

## Africa's VOD future

 Econet's new pan-African media division has launched a new IPTV video on demand service. It claims *Kwesé Play* will be "slicker and faster" than anything currently available on the continent. The firm will leverage Africa's largest fibre network available through sister company Liquid Telecom which acquired Neotel last year. According to Econet Media, Neotel holds "leading-edge" 4G and 5G spectrum capability which is being configured to carry video. The company promises more than 100 VOD services including content from Roku, Netflix, YouTube, RedBull TV, *et al.*

# New CEO has high hopes for Zanzibar

Zantel (Zanzibar Telecom) is promising to take both its customers as well as Tanzania to new heights following the completion of its network modernisation and roll out of new products and services into 2018.

At the end of September, new CEO Sheriff El Barbary told reporters that Zantel aims to improve network quality and coverage in order to deliver "best in class" services to customers and the country. He said the company is in the

final stage of its network modernisation and that it now covers 22 regions across the country with 4G infrastructure.

"We have created more than 5,000 [jobs] countrywide. This is direct and indirect employment through our *EzyPesa* platform where we have more than 2,500 agents, and also have partners providing different services who also employ staff to serve Zantel."

El Barbary added that Zantel will also work on supporting the government



CEO Sheriff El Barbary told reporters that Zantel aims to deliver "best in class" services to customers and the country.

to reach various SDG targets. Furthermore, he plans to focus on the company's wholesale and enterprises operations which he considers "key for business". Zantel manages the EASSy and SEAS submarine cables with landing points in Dar es Salaam.

Established in 1999, Zantel is currently 85 per cent owned by Millicom while the remaining shares are held by the government.

## UHP unveils 'Functionality-as-a-Service'

UHP Networks has launched what it describes as a 'Functionality-as-a-Service' (FaaS) broadband data platform. Called *RUN*, the new service is said to be optimised to take advantage of the maximum efficiency offered by Intelsat's *EpicNG* high-throughput satellite fleet.

Canada-based UHP specialises in developing and manufacturing satellite networking equipment. The company claims it has come up with the industry's first fully software-defined, high-throughput VSAT router. It says this can be used in a network of any size and any topology either as a remote or component of a VSAT hub.

*RUN* is an in-country VSAT service with a cloud-based network management system. UHP claims that the platform uses low-capex, universal routers to provide an easy-to-operate system that will initially be available in Africa, the Middle East, and Central and South Asia.

By partnering with Intelsat, the firm reckons it is "uniquely positioned" to deliver its high-efficiency solution to enterprises, telcos and government users that require a flexible, high-performance infrastructure.

"*RUN* is designed to lower the barrier of entry for deploying high-throughput, in-country VSAT services,"

says Vagan Shakhgildian, president and CEO, UHP Networks. "Combining Intelsat *EpicNG*'s improved performance with UHP's unique, software-definable VSAT platform addresses the initial cost for private network hardware and makes the service easier to manage. This enables service providers to cost-effectively deploy solutions to support both existing and emerging applications."

Intelsat adds that by powering the new service, users will be able to leverage *EpicNG* and local infrastructure to enable more traffic to "cost-effectively" originate and land in-country.

## Liquid to provide services for DataHack4FI

Liquid Telecom is supporting startups entering the *DataHack for Financial Inclusion* (*DataHack4FI*) competition by providing free high-speed internet access and cloud-based services.

*DataHack4FI* is run by insight2impact (i2i), a South African based resource centre that aims to catalyse the provision and use of data by the private and public sectors to improve financial inclusion. Now in its second year, the competition endeavours to bring together some of the continent's most innovative minds to harness the power of data science to support this aim.

The 2018 competition will be held across Tanzania, Zambia, Rwanda, Kenya, Uganda and Ghana, where startups undergo mentoring and training before presenting their data-driven solutions to a judging panel. Successful



Now in its second year, *DataHack4FI* will be run across six African countries with startups competing for seed funding for innovations that promote financial inclusion.

teams will proceed to the final competition, due to be held in Rwanda in May, where they will compete for seed funding from global investors.

Leveraging its 50,000km pan-African fibre network, Liquid says it will provide high-speed and reliable connectivity throughout most stages

of the competition, including the startup pitch events.

Entrants will also have access to a range of cloud-based products and services as part of *Go Cloud*, a new programme launched by Liquid and supported by Microsoft (see *News*, Mar-Apr 2017 issue). They will be able to use the *Microsoft Azure* platform to access critical development tools that can be utilised for data science-driven applications and hosting.

More than 120 individuals competed in the 2017 *DataHack4FI* competition, with three startups successfully attracting seed funding from investors. The overall winner of the competition was Mobiticket which aims to digitise the public transport system in Kenya by enabling vehicle operators to receive cashless payments.

# Satellite goes on safari with SatADSL

SatADSL has been helping wildlife reserves to offer Wi-Fi connectivity to tourists. The Belgium-based African VSAT specialist says it is offering a hotspot solution with multiple wireless connectivity applications to safari parks in very remote areas.

The parks often provide accommodation for tourists during safaris. These lodges are usually located within or near national wildlife reserves, and offer activities such as game drives. Different types of lodges are available, from rustic camps to luxury designs, with the latter expected to provide Wi-Fi connectivity even if they are located in remote areas.

SatADSL makes remote wireless network access possible with its *Safari Solution*. One of the latest users is Namibia Wildlife Resorts. It provides a wide range of accommodation in the Etosha National Park which covers nearly 23,000km<sup>2</sup> of savannah in the north of Namibia.

SatADSL says its solution enables visitors to stay connected, and adds that selling Wi-Fi access vouchers to tourists

also generates extra profit for the parks.

In a separate announcement, the company says it recently participated in a "unique and extraordinary" pilot application that involved the use of satellite telemetry to track animals in Namibia and Kenya.

This pilot was made possible with the support of the *SATLAS* project and in collaboration with the European Space Agency (ESA) and SES.

*SATLAS* is run by the ESA and was recently concluded in September 2017. It served as an incubator for developers to test and further develop their innovative ideas over satellite, in order to verify their viability from a technical and business model perspective.

SatADSL was involved in one of five pilots that were conducted in Africa and Europe. It helped national safari parks in Namibia and Kenya

who wanted to be able to determine the number of animals, locate them for protection, monitor their movements, and quickly identify sick or abandoned ones.

The application it helped test also provides an alarm signal if an animal leaves a specific area. All information is stored in the animal's tracking device and is then communicated to orbiting satellites.

## Partnership for end-to-end IoT

Microsoft and Orange Business Services (OBS) have teamed-up to deliver large-scale, end-to-end IoT solutions that boost the digital processes of companies in the manufacturing sector.

The *Microsoft Azure IoT* suite now supports OBS' *IoT Dataview* service. *Dataview* is said to offer a comprehensive set of solutions and services to securely manage IoT projects and their integration with information systems.

OBS claims the service features 14 million connected and managed devices, and the capacity to handle more than 160 million items of technical data per minute.

The company adds that the software environment provided by Microsoft will allow for the use of advanced solutions such as the *Cortana Intelligence Suite*, *Power BI*, and the *Xamarin* app to ensure a "flawless" mobile user experience.



# Siae Microelettronica deploys “state-of-the-art” backhaul across Africa

Siae Microelettronica has almost completed a project that it began earlier this year to deploy “state-of-the-art” wireless transport networks for a pan-African mobile operator.

As part of a multimillion dollar contract announced in March, the Italy-based global wireless communication technology specialist is now due to start implementing microwave and millimetre wave radios for the operator’s new LTE backhauling deployments. While it is unable to

disclose its client’s name, Siae says the new transport networks will launch or extend 4G services in the cellco’s respective countries, thereby unifying its mobile offering across the region.

The firm’s teams started in the first half of 2017 and are on track to complete the ramp-up phase by December 2017. The complete rollout will be accomplished over three years.

Siae says the installations involve all wireless transport technologies, including its AGS20 split mount

platform, and full outdoor and trunk ALFOplus2 microwave radio for “high-capacity, pervasive coverage” in rural and urban areas.

The company is also using its ALFOplus80HD millimetre wave radio. It expects this to boost multigigabit capacity in urban areas, maximising LTE performances in terms of latency and capacity for subscribers. It adds that the operator can also use the same technology to expand coverage for its enterprise business.

In addition to its hardware, Siae is also supplying all services related to network design, optimisation, installation and commissioning.

“Hardware and services bundles offer stronger TCO model to operators,” says Nicola Bonzanino, the vendor’s international sales director, MEA. “When the available infrastructures are limited and terrain adverse, microwave radio is the best fit to bring connectivity to remote areas, with fast deployment and immediate time to service.”

## Digital Holidays a “great success” in Madagascar

The Malagasy government recently concluded its *Digital Holidays* event and hailed it as a “great success”.

Led by the Ministry of Posts, Telecommunications and Digital Development, the initiative aims

to promote digital literacy among young people.

During the *Digital Holidays*, which took place from 16 August to 22 September, various activities and training classes were organised to

give as many people as possible the chance to take advantage of the free internet that was available and become familiar with digital tools.

The event also saw contests such as a mini hackathon, and the design of a bot messenger to help galvanise the local developer community and support their projects.

In Antananarivo, the holidays were organised in collaboration with Orange Madagascar. The operator partners the Ministry of Posts, Telecommunications and Digital Development for the implementation of the government’s



The closing ceremony of the *Digital Holidays* in Antananarivo was marked by the presentation of trophies and certificates to the winners and participants of the bots for messenger contest.

*Digital for All* project. This supports initiatives for inclusive digital development in Madagascar.

## Burundi to expand mobile network with Huawei loan

Burundi’s state-owned Onatel plans to modernise its mobile subsidiary with the help of a multimillion dollar loan from Huawei.

ONAMOB is one of four mobile operators in the country. Together with its rivals – Econet Leo, Smart and Vietnam’s Lumitel – it shares a mobile subscription base that currently stands at 4.8 million connections which represents 43 per cent SIM penetration (according to GSMA Intelligence).

Built in 2004, the network was expanded once in 2010 but has struggled to compete with rivals who invest in more modern and efficient network infrastructure and services.

In 2013, it was widely reported that the government wanted to offload a

majority stake in ONAMOB. At the time, *TeleGeography* stated that the mobile operator was running 51 sites in Burundi with claimed coverage of around 80 per cent of the population. It added that in order to achieve total coverage, ONAMOB’s new owners would need to deploy a further 50 sites.

The government now hopes that with Huawei’s backing, the modernisation and network extension will enable ONAMOB to better compete and improve revenues. Huawei is financing the project via a USD30m 10-year loan which government secretary-general and spokesman Philippe Nzobonariba reportedly described as “a survival investment”.

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# Ecobank and Visa give all Africans the right to join the digital economy

Ecobank and Visa have joined forces to launch Ecobank's *Scan+Pay* system with *mVisa* solutions to customers across 33 African countries.

According to the partners, their strategic tie-up signals interoperability on a cross-border level. It will enable consumers to use their mobiles to directly access their bank account funds for person-to-merchant or person-to-person transactions.

It's claimed *Ecobank Scan+Pay* with *mVisa* delivers instant and secure cashless payments for goods and services. Customers use the service by scanning a QR code with a smartphone, or entering a unique merchant identifying code into either a feature phone or smartphone. The payment goes straight from the customer's bank account into the merchant's account, and provides real-time notification to both parties.

Ecobank believes that the new service will accelerate digital commerce and overcome some of the challenges merchants have faced using traditional point of sale systems, such as the cost of installation and the need for electricity and internet connectivity.

"We are fulfilling our commitment to give every African the right to participate effectively in the global economy at an affordable price and in a convenient manner," says Ecobank CEO Ade Ayeyemi. "*Scan+Pay* with *mVisa* helps merchants – particularly small and micro merchants – to grow their sales without the risks of carrying cash, whilst also giving consumers the ability to pay for goods and services in a cashless manner from their phones."

Ecobank *mVisa* solutions also enable users to send money instantly to any Visa cardholder worldwide. The companies reckon this is a "major innovation" that serves the need of Africans in the diaspora by enabling them to simply link their Visa card to the Ecobank unified mobile app to send money home to another Visa cardholder quickly and securely.

Customers use the service by scanning a QR code at the point of sale with a smartphone, or entering a unique merchant identifying code into their feature phone.



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## Model for roaming costs

 The Communications Regulators' Association of Southern Africa (CRASA) has launched a tender for the development of a model for regional roaming costings in which all SADC companies can participate. In a note published on its website, the association says interested companies may qualify for the competition by requesting the tender documentation via an email to [crasa@it.bw](mailto:crasa@it.bw). Once the requirements have been met, all respective documentation must be submitted to CRASA by 10am on 30 November 2017.

## Monet lands in Fortaleza

 The *Monet* undersea cable that will directly connect Brazil and the US has now arrived in Fortaleza. Angola Cables, one of its owners, says the arrival of *Monet* is an important milestone in its strategy as the cable will interconnect to its *South Atlantic Cable System (SACS)* that is currently under construction. The company is building a data centre in Fortaleza, two submarine cable stations, and says it has advanced the construction of *SACS* which should be ready for commercialisation in 2018.

## Mobile fees and taxes

 Lumitel has claimed a "giant leap" for Burundi's economy as subscribers can now pay government duties and fees via its *Lumicash* mobile banking service. Developed with the country's Office of Revenue, the operator reckons *Riha OBR via Lumicash* will make life "easier" for citizens. It says instead of "waiting all day in front of the OBR offices", subscribers can use their mobiles to pay taxes and fees remotely. But it adds that the service can only be used for "small" sums.

# Teledata de Moçambique backhauls using satcoms

Teledata de Moçambique will use satellite technology to backhaul its 2G, 3G and banking application sites across Mozambique.

The state-owned telco will utilise two Ku-band spot beams on *Intelsat 33e* to provide web access and file transfer capability along with equipment from Newtec. The latter includes the vendor's *Dialog* platform with the *4IF* hub module at its core.

Newtec says its *MDM3310* satellite modem will also be used for backhaul, while its *MDM2500 IP* satellite modem will connect hundreds of ATMs at remote sites, as well as providing backup connectivity to enhance reliability for regional bank branches.



Teledata will use Newtec's *MDM3310* satellite modem for cellular backhaul.

"Upgrading our networks to a single multiservice platform using *Dialog* enables us to simplify our day-to-day operations and to deliver reliable connectivity to a large number of sites across Mozambique," says Xavier de Jesus Maria, CE, Teledata. "The scalability of the platform means it can meet our needs both now and in the future, allowing us to operate flexibly and have the potential to offer

improved and additional services for our customers."

As well as TDMA and SCPC, *Dialog* features Newtec's return link technology which enables bandwidth to be changed and adapted on-demand. It's claimed this has enabled Teledata to better manage the bandwidth at its cellular backhaul sites which will result in "significant" cost savings.

## TM Forum's blueprint for hybrid networks

TM Forum has launched a blueprint aimed at helping CSPs address the problem of managing hybrid network environments.

According to the forum, its *Implementation and Deployment Blueprints for Hybrid Environments* provides a standardised and interoperable approach to solving the fragmentation between traditional and virtualised infrastructures and systems. It claims the guidance provides CSPs with measured ways to manage the migration, creating a smoother digital transformation.

The TM Forum is a global association of more than 850 member companies who work together in order to maximise the business success of communication and digital service providers. Its CEO Nik Willetts says: "As the telecoms industry rapidly transforms, it is essential that enabling technology and standards are put in place to allow existing infrastructures and systems to communicate with new and future architectures."

The blueprint was developed by members as part of the forum's *Zero-touch Orchestration, Operations and*

*Management (ZOOM)* project. They say it offers a complete implementation and deployment blueprint for managing a multi-vendor, hybrid/NFV infrastructure. This includes open APIs, information models, best practices and deployment guides.

It is also said to provide a number of management capabilities not currently available together in a standardised package. These include: resource function activation and configuration; inventory management; catalogue management; and assurance.

## Boosting services and profits in Madagascar

Telma (Telecom Malagasy) is hoping to fuel its mobile growth and enable innovative VAS, such as its *MVolà* mobile banking application and pre-paid online reload service, with the help of Sicap.

Part of Axian Group, Telma is said to be Madagascar's leading telco and offers services delivered via its nationwide mobile, fixed and fibre networks. It will use Sicap's *Mobile Device Management Centre (DMC)*, USSD and *USSD Menu Browser* solutions.

Citing 2015 data from the GSMA, the Switzerland-based vendor says Madagascar's mobile broadband and SIM penetration is only around 30 per cent. It says that despite providing a



Telecom Malagasy CTO Jerome Valentin says Sicap will enable the launch of VAS that can be used with low-end devices.

great revenue growth opportunity for local operators, the prevalence of low-cost handsets in the market also makes it hard for cellcos to make profits.

"Low-cost devices are costly for operators as they are more difficult to connect to a network and the owners frequently seek for support from operators' care centres," states Sicap.

"The under-developed mobile device base also makes implementation of value-added services challenging for mobile operators."

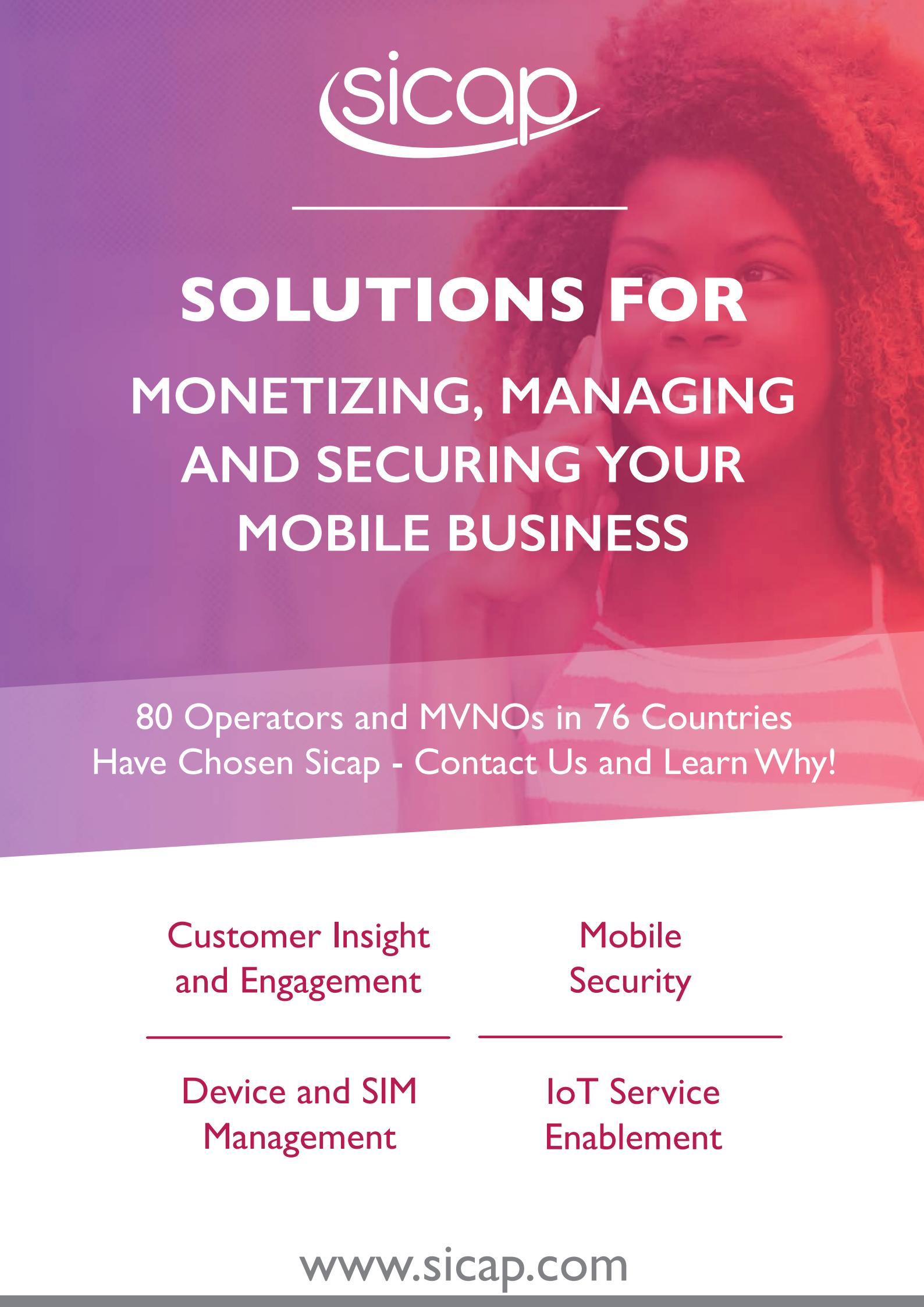
Telecom Malagasy CTO Jerome Valentin says using the vendor's USSD and *USSD Menu Browser* solutions will enable the operator to implement innovative value-added services, which can be used by low-end feature phones as well as by smartphones.

He adds: "Sicap's Device Management Centre automatically detects and configures most device brands in the African market and handles devices with fake device identification code (IMEI)."



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# Dell plans to donate millions to support STEM education

As a part of ongoing efforts to invest in a more diverse technology workforce, Dell Inc. expects to contribute USD14m in grants and technology donations to support future generations of STEM workers, during its current financial year which ends February 2018.

The computer company says current donations made across its 71 youth learning partners globally are expected to bring technology education to more than 1.5 million underserved youth. Dell adds that with the expected contributions, a total of four million children will be impacted through its CSR programmes since 2014.

Dell has dedicated funds, technology and expertise globally to further empower and enable interested youth from around the world to explore STEM fields.

## HYLAS 4 delayed but still on track

Avanti Communications now plans to launch *HYLAS 4* next year. It has agreed a launch slot for its next African satellite with Arianespace beginning 1 March 2018.

The new Ka-band satellite features part traditional chemical orbit raising, part electric orbit raising, and electric station keeping. The previously announced launch slot of 4Q17 would have required around 100 days of electric orbit raising for it to reach geostationary orbit, therefore on station by early April 2018.

However, Avanti says the intended launch configuration of the new slot means extra chemical fuel can be loaded on *HYLAS 4* as it will now be paired with a lighter partner spacecraft than originally planned. This enables chemical-only propulsion to be employed whereby the satellite reaches geostationary orbit in just 10 days, saving approximately 90 days of electric orbit raising.

One of the organisations that it helped this year with a grant of USD650,000 is Camara Education. The Ireland-based charity provides educational institutions with technology and support to help them improve educational outcomes. In

Africa, Camara delivers its services through a network of local hubs in Ethiopia, Kenya, Lesotho, Tanzania and Zambia. This year, Dell donated a grant of USD650,000, benefiting more than 250,000 youth and 2,000 educators in 240 locations.

Dell has also recently opened two new Solar Powered Learning Labs in South Africa this month, with more planned. These bring technology and connectivity to students, teachers and communities using solar power and thin client workstations from Wyse.

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\*Terms and conditions apply. The offer is valid till 30 October 2017.  
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# IDT VoiceHub – the industry's first, flexible outsource solution

## IDT VoiceHub – creating real value on the voice minute

As we all know within the international voice industry, it's in a little bit of trouble. Revenues are decreasing and margins are so razor thin that it's a challenge for network operators to see value in the international voice business. In addition, how core is international voice for network operators all over the world, given their focus is to ensure domestically that their network runs at capacity and ensure that its subscriber base is increasing?

The move to IP technology removed one of the barriers to entry into international wholesale voice. As a result, mobile groups are establishing their own interconnects and interconnecting to other groups. And we all know the impact of traffic migrating away to OTT apps and the like.

The knock on effect of this will mean wholesale companies will fold or consolidate, leaving fewer carriers in the market and those networks that see international voice as a non-core service, means there is little desire to invest in that part of their business with such small margins.

### IDT – an originator of the retail minute

So how is IDT Carrier Services dealing with this situation, given that we only carry international voice traffic? As most of our customers know, our network reach is already global with 600+ direct connects and 430+ CLI-certified routes. In terms of volume, we carry 28billion minutes annually, with a large percentage these minutes generated through IDT Telecom's own retail brand, BOSS Revolution. The volume of our proprietary retail minutes allows us to provide unique buying and selling opportunities for operators worldwide on the wholesale side. Contrary to industry trends, our minutes have actually grown for the last four quarters.

We also offer a portfolio of quality termination, have extensive fraud management tools and we continue to invest by optimizing our systems, automating our operations and modernizing our network for voice traffic. One recent example of this was the launch of our BOSS Revolution MVNO in the US – which will continue to generate even more international retail minutes to deliver on to our customer's networks.

### Introducing IDT VoiceHub

Our latest offering within the carrier space is our recently launched IDT VoiceHub, specifically



designed for any telecom operator with inbound or outbound international voice traffic that wishes to leverage IDT's resources and expertise to boost their operating and financial performance. It offers a portfolio of outsourcing solutions to address the specific circumstances of an operator based on region, volumes and routes. Different solutions include:

- Hybrid arrangement where an operator wishes to retain certain routes or customers directly while optimizing the rest of their business and IDT would simply manage a subset of destinations, for example regional or long tail.
- Managing the inbound traffic flow, minimizing grey routes, bypass eradication
- Managing the inbound and outbound traffic

Whatever model you consider, the benefits are plentiful. Whether it is positive EBITDA level improvement, minimizing your investment to avoid arbitrage, fraud QoS issues, and capex; minimizing grey routes, bypass eradication etc, the list goes on.

### Leverage an international voice specialist

We have the global reach, the minute volumes, the network and the expertise to be able to achieve financial stability for your international voice business. As we are an international voice specialist that generates our own retail volumes

as well as diligently carrying voice traffic from fixed and mobile operators the word over, all our investment and infrastructure is solely based around voice, and we have a long-term evolution roadmap to ensure we remain relevant for our customers worldwide in carrying their voice traffic. Operators can simply tap into our infrastructure and work together to enhance profitability and future proof their voice business as the industry evolves. We'll take you with us on that journey.

We understand how your business operates in the complex world of international voice traffic, as that is what we do. In an industry where we all need to be open to new ways of partnership to sustain a profitable voice business, we would be delighted to work with operators and their carrier teams to explore an outsourcing model that is right for your business.

**IDT VoiceHub. Scale you can trust.**

**[idtcarrierservices@idt.net](mailto:idtcarrierservices@idt.net)**



# Number of large-scale IoT projects “doubled” in the last year

The percentage of companies around the world with more than 50,000 connected devices active in the Internet of Things has doubled in the last 12 months, according to Vodafone.

For its fifth annual *IoT Barometer Report* published at the end of September, the operator surveyed 1,278 key decision makers across various industries in 13 countries. They included the US, Germany, UK, India, China, Brazil, Italy, Spain, New Zealand, Ireland, Australia and Japan, as well as South Africa where 96 respondents were polled.

The study found that IoT technology is increasing revenues or opening up new revenue streams for 51 per cent of adopters, and that 66 per cent of all companies agreed that digital transformation is impossible without IoT.

Businesses in the Americas have led the way in embracing large-scale projects, where 19 per cent using IoT have more than 10,000 connected devices. That's compared to 13 per cent in Europe and seven per cent in Asia Pacific.

The large-scale users also report some of the biggest business gains with 67 per cent highlighting significant returns from the use of IoT. Energy and utility companies are at the forefront of the largest projects worldwide, with applications such as smart meters and pipeline monitoring.

EMEA polled higher than the global average (71 per cent) when it came to the topic of the future of IoT, with 74 per cent of the region's respondents stating that by 2022 they will no longer talk about IoT as it will just be about business outcomes.

Among some of the key research findings for South Africa, Vodafone said 86 per cent are optimistic about the possible business outcomes of connecting almost everything, and 57 per cent revealed that they will be using IoT in the next 12 to 24 months to manage risk.

As the scale of IoT projects increases globally, the report also noted a rise in connectivity requirements. Vodafone said organisations are looking to use a mix of technologies from fixed line to LPWAN depending on the application.

Mobile and Wi-Fi are the two most popular options for large-scale projects, but there is also increasing interest in newer technologies such as NB-IoT with 28 per cent now considering it as well as other LPWAN options for new IoT projects.

“Over the five years of this

report we have seen the number of companies that have adopted IoT double, and projects have grown from small pilots to global rollouts of tens of thousands of connected devices,” said Vodafone director of IoT Erik Brenneis. “IoT is clearly here to stay and the future looks exciting as 79 per cent of adopters are saying that [it] will have an enormous impact on the whole economy in the next five years.”

Brenneis believes that IoT has now “come of age” and is proving itself across all industries and geographies. His words were recently echoed by Deon Liebenburg, managing executive for Vodafone subsidiary Vodacom. He said that the IoT was “no longer hype” and claimed Vodacom was averaging 55,000 new IoT connections per month in South Africa (*see News, Sep-Oct 2017*).

## Avanti has “positive outlook” for new financial year

In its trading update for the financial year ended 30 June 2017, Avanti Communications Group said revenues for the fourth quarter rose in excess of USD16m resulting in total sales for the year of around USD62m.

In a quarterly statement published at the end of May, the company

added that a number of projects to sell spectrum were “progressing well” but that they did not close in time to impact the final quarter.

In July, Avanti announced the award of a new three-year contract worth up to USD21m to deploy several hundred services to government sites across Africa with an existing unnamed government customer. It says this, in addition to

recent announcements of mobility, 5G and broadband orders along with a strengthened balance sheet, creates a “positive outlook” for the new financial year.

Last year, the group said it was open to a takeover to address its funding requirements (*see Wireless Business, Jul-Aug 2016*). But in December 2016, Avanti announced that it had completed its strategic

review which included termination of the formal sale process and end of offer period.

The company proposed a refinancing scheme that will fully fund it through the creation of USD242m of additional liquidity through USD130m of new cash funding and up to USD112m of potential interest deferrals up to April 2018. Avanti said this will give

## LATEST COMPANY RESULTS

Date	Company	Country	Period	Currency	Sales (m)	EBITDA (m)	EPS (units)	Notes
20/10/17	Ericsson	Sweden	3Q17	SEK	47.8 (bn)	NA	-1.43	Reported sales decreased by -6% YoY. In MEA, sales were flat YoY, negatively impacted by currency movements & declining sales in Africa. CEO & president Börje Ekholm said: “As communicated in the Q2 report we have identified an increased risk of further market & customer project adjustments, considering the current market environment & our focused strategy. In total, the negative impact on results was then estimated to be SEK3 to 5bn until mid-2018.”
24/10/17	Millicom	Luxembourg	3Q17	USD	1,509	556	0.31	Total revenue increased 1.6% YoY from USD1,486m in 3Q16. On an organic basis, to reflect local currency & at a constant perimeter, growth was 1.3%. All financials now exclude Senegal & Ghana which are discontinued operations.
26/10/17	Intelsat	US	3Q17	USD	538.8	420.5	0.26	Net loss of USD30.4m reported for three months ended 30 September 2017. CEO Stephen Spengler said revenues & adjusted EBITDA “reflect the ongoing transition of our business”. Company now expects to come in at the bottom of the previously disclosed revenue guidance range of USD2.150bn to USD2.180bn for 2017.
26/10/17	Nokia Corp.	Finland	3Q17	EUR	5.5 (bn)	NA	-0.03	Reported net sales during quarter represent 7% YoY decrease (4% decrease on a constant currency basis). Networks division saw 9% YoY net sales decrease (6% decrease on a constant currency basis), primarily due to ultra broadband networks, reflecting challenges related to market conditions & certain projects in mobile networks, mainly in North America & Greater China.

it "significant" working capital to launch *HYLAS 4* and grow into its capital structure. The satellite was planned for launch in 4Q17 but this is now expected in March 2018 (*see News, p11*).

### SqwidNet and Adroit IIoT

SqwidNet, the licensed Sigfox operator in South Africa, has teamed up with Johannesburg-based SCADA

Adroit Technologies to boost the Industrial IoT in the country.

The partnership enables IIoT application and service providers to use Adroit's cloud-based SCADA and industrial-automation platforms via SqwidNet's Sigfox network.

SqwidNet launched in November 2016 and is a wholly owned subsidiary of open-access fibre connectivity provider DFA. The

company's network is already said to cover all of South Africa's eight major metro zones and 64 per cent of the national population. The firm adds that the network will span the entire country by 2018.

Adroit Technologies MD Dave Wibberley says: "We see Sigfox technology as much more compelling from a scalability, simplicity, cost, and ease-of-integration perspective

than traditional telemetry options."

He continues by saying SqwidNet's technical experts have helped Adroit to build interfaces to the Sigfox back-end. A number of trials based on data from sensors and connected devices on the SqwidNet network have now been developed. "We have successfully completed several proofs of concept for use cases such as water quality readings, automated

## NEW APPOINTMENTS

Date	Name	New employer	New position	Previous employer	Previous position
1/6/17	Dr. Lih Shyng (Rick) Tsai	MediaTek	Co-CEO	Chunghwa Telecom	Chairman
11/7/17	Khaled Zeidan	Coriant	MD MEA	IneoQuest Technologies	Regional sales director, MENA
24/8/17	Reza Ghaffari	Coriant	EVP global services & operational excellence	Coriant	SVP global services
19/9/17	Colin Sabol	Xylem	SVP & president of Sensus & Analytics	Xylem Analytics	President
27/9/17	Douglas Stephenson	NA	NA	Telekom Networks Malawi	Official statement on telco's website says Stephenson is "no longer employed" as CEO.
27/9/17	Eric Valentine	Telekom Networks Malawi	Acting CEO	Telekom Networks Malawi	Valentine has been acting CEO since July 2017. Will now continue in this role until a new appointee is announced.
2/10/17	Alam Ali	Motorola Solutions	VP, records & evidence systems, Software Enterprise	Tersai Corporation	Founder & SVP of product & operations
2/10/17	Iain McDonald	Motorola Solutions	VP, software deployment & integration, Software Enterprise	Microsoft	GM & partner engineering manager
3/10/17	Brad Surak	Hitachi Vantara	Chief product & strategy officer	GE Digital	COO
3/10/17	John Murphy	Hitachi Vantara	VP, offerings management	IBM	VP, Watson data platform
6/10/17	Ebenezer Asante	MTN Group	VP, Southern & East Africa & Ghana region (SEAGHA)	MTN Ghana	CEO
9/10/17	Ronnie Leten	Ericsson	Chairman	Atlas Copco	President & CEO
18/10/17	Willington Ngwepe	ICASA	CEO	ICASA	COO
19/10/17	Samir Marwaha	Sandvine	CMO	Netscout	VP & GM of new markets business

## INVESTMENTS, MERGERS & ACQUISITIONS

Date	Buyer	Seller	Item	Price	Notes
6/9/17	Shareholders	Redknee Solutions	Rights offering	CAD0.63 per share	Under the Rights Offering, an aggregate of 108,519,936 subordinate voting shares were issued for gross proceeds to Redknee of around CAD68m. Net proceeds will be used to fund a restructuring of the business to further a previously announced strategic plan.
3/10/17	ARRIS International	Broadcom Limited	Ruckus Wireless & Brocade's ICX switch business	USD800m + extra cost of unvested employee stock awards	ARRIS originally announced its agreement to acquire both Ruckus Wireless & Brocade's ICX switch business from Broadcom in March 2017. In October, ARRIS said it remained committed to the agreement but said it was contingent on Broadcom closing its acquisition of Brocade Communication Systems, the current owner of Ruckus Wireless.
4/10/17	Ekinops	OneAccess	Company acquisition	EUR60m (estimated)	It's claimed the combination creates a "major player" in transport, Ethernet & corporate routing solutions for telecoms networks. Merged entity generates combined revenues of approximately EUR76m & EBITDA margin of 6.3%. Market capitalisation of the new group amounts to around EUR119m (as of 29 September 2017).
5/10/17	TIBCO Software	Cisco	Data virtualisation business (formerly Composite Software)	NA	The acquisition specifically includes Cisco's Information Server for enterprise-scale virtualisation & associated consulting & support services. TIBCO says move strengthens its portfolio of analytics products, & claims it will enable businesses to get analytic solutions into production faster than alternatives, while continuing to adapt as data sources change from traditional databases and Big Data to cloud & IoT.
16/10/17	CITIC Telecom CPC	Linx Telecoms	Company acquisition	NA	The Hong Kong telco says the completion of its acquisition of Europe-based Linx's telecoms business gives it 140 points of presence in 130 countries across the so-called 'Digital Silk Road' that links Asia, Europe & Africa. Merged company is named CITIC Telecom CPC Europe.
19/10/17	ENGIE	Fenix International	Company acquisition	NA	Founded in 2009, Fenix offers solar home systems in Africa. Its main activities are in Uganda where it has more than 140,000 customers. It recently expanded into Zambia & plans further rollouts in other countries across Africa. ENGIE says the investment will contribute to its goal of providing 20 million people around the world with access to "de-carbonised, decentralised" energy by 2020.

meter readings for both water and electricity, and manhole tip sensor readings," says Wibberley.

France-based Sigfox is a global provider of IoT connectivity and currently has deployments in 36 countries. Adroit is currently in the process of becoming a certified Sigfox partner for devices and for its SCADA platform.

#### OT-Morpho becomes IDEMIA

The OT-Morpho group now wants to be known as 'IDEMIA'. The name change is the result of the merger between Oberthur Technologies and Safran Identity and Security (Morpho) completed on 31 May 2017.

According to the identification and authentication specialist, IDEMIA is a reference to identity, idea and the Latin word *idem*.

The company adds that its ambition is to "empower citizens and consumers to interact, pay, connect, travel and even vote securely while taking advantage of the opportunities of an increasingly connected world".

It is supported by a workforce of 14,000 employees from all over the world, including 2,000 in R&D.

#### IN BRIEF...

 The South African government's Small Enterprise Development Agency (Seda) is said to have further bolstered its support for the country's hardware tech sector by partnering with Savant NPC. The Cape Town-based organisation describes itself as a "highly specialised and commercially-focused" hardware technology incubator. It says: "The partnership with Seda aims to nurture the next generation of local hardware technology inventors with ideas that can be developed into thriving businesses."

 MTN Group has announced the appointment of Ebenezer Asante as VP of ITS expanded Southern and East Africa and Ghana (SEAGHA) region. He is currently CEO of MTN Ghana. The new region will comprise operations in Ghana, Uganda, Rwanda, Zambia, South Sudan, Botswana and Swaziland, as well as MTN ISPs in Kenya, Namibia and Botswana. Asante takes over from Karl Toriola who is VP for West and Central Africa and had been managing

operations in the SEA region in an acting capacity.

 MTC is calling on Namibia's corporations to focus their sport budgets to rural and less privileged communities. In early September, the cellco supported the Okakarara Horse Racing Event and hailed it as a success. Speaking at the time, MTC's sponsorship and promotions manager Joseph Mundjindi said: "We have noticed

that corporate support for sports has for the large part only been concentrated within urban areas, thus leaving the peri-rural areas neglected... [this] cannot augur well for Namibia as a sporting nation."

 Viettel Global is planning to launch operations in Nigeria. At its AGM earlier this year, the Vietnam military-owned telco said investments in the country along with a new operation in

Indonesia would create conditions for it to continue to grow its interests elsewhere. It is aiming to begin in 1Q18. Viettel reported a 21 per cent YoY decline in revenues last year, with its networks in Mozambique and Burundi particularly suffering due to forex issues. But it did see earnings growth in Tanzania, Cameroon and Mozambique. The company also has subsidiaries in Haiti, Laos, Cambodia, East Timor, Peru and Myanmar.



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Envision. Connect. Transform.

# Cambium promises the capacity to connect more subscribers

With up to 1.36G throughput capacity, Cambium Networks says its PTP

**MANUFACTURER:**  
Cambium Networks

**PRODUCT:** PTP 550 & ePMP Force 300

**MORE INFORMATION:**  
[www.cambiumnetworks.com](http://www.cambiumnetworks.com)

550 (*pictured right*) point-to-point backhaul radio enables operators to connect more subscribers and reach new market opportunities.

With spectrum being a precious commodity, the company says the PTP 550's non-adjacent asymmetric channel aggregation capabilities "efficiently" consolidates limited blocks of bandwidth to deliver the capacity demanded by advanced network service providers.

The radio can be set up using Cambium's *LINKPlanner* software. The firm says this provides free network planning tailored to the exact source and destination points on a *Google Earth* map.

It adds that onboard dynamic spectrum optimisation enables the link to monitor performance in real time and automatically make adjustments to maximise throughput.



Cambium has also unveiled the ePMP Force 300 point-to-multipoint module. With a data rate of up to 500Mbps, the 802.11ac Wave2 device works in the unlicensed 5.1-5.9GHz band, and has a 25dBi reflector antenna for long-range connectivity.

## RFS coaxial cables said to be ideal for public safety

Red public safety UHF/VHF coaxial cables are the latest offering in RFS' line of plenum-rated wideband

**MANUFACTURER:** RFS

**PRODUCT:**  
Red Plenum Coaxial Cables

**MORE INFORMATION:**  
[www.rfsworld.com](http://www.rfsworld.com)

products. They are designed for mission critical users who need an easily identifiable cable, and deliver what RFS claims is "outstanding" electrical performance and support for all wireless in-building applications.

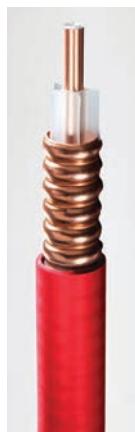
Due to their low attenuation, "superior" heat transfer properties, and temperature-stabilised dielectric materials, the firm reckons its plenum-rated wideband cables offer a safe, long-term operating life at high-

transmit power levels. It adds that they feature low-flame-spread and low-smoke characteristics, and meet the "most stringent" plenum cable standards, such as CMP and ETL listed to UL444. RFS says this makes them ideal for use within the ceiling area defined as the 'environmental air handling space', as well as for more traditional plenum applications.

It adds that the cables' solid outer conductor creates a continuous

RFI/EMI shield that minimises system interference.

Furthermore, the cables have a star-shaped continuous dielectric, providing total support that is said to eliminate electrical or mechanical problems in tight bending areas.



## Rohde & Schwarz "pioneers" NB-IoT field measurements

Rohde & Schwarz (R&S) says it has come up with the world's first accurate LTE/NB-IoT coverage measurement solution.

The company says the new solution is based on its "field proven" ROMES drive test software for measuring network quality with scanners and test mobiles in all mobile technologies. It can be used in combination with the vendor's TSMW, TSMA and TSME scanners.

In tests, R&S says it was able to demonstrate the verification of device/network interworking by connecting

NB-IoT user equipment to ROMES. Apart from RF tests, it says this setup provided further metrics such as downlink and uplink latency and throughput, and protocol behaviour.

According to the firm, using a scanner is the only viable solution for accurate and comprehensive measurement results. Unlike testing with NB-IoT user equipment, it claims scanner-based testing is passive and captures the measurement data directly from the RF air interface, including receive power levels and CINR (carrier-to-interference-and-noise-ratio).



**MANUFACTURER:**  
Rohde & Schwarz

**PRODUCT:** ROMES with NB-IoT

**MORE INFORMATION:**  
[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Carrier Wireless Service Certification programme

The Wireless Broadband Alliance (WBA) has launched a *Carrier Wireless Service Certification (CWSC)* programme to enable the independent testing and certification of devices, initially, for Wi-Fi roaming and Wi-Fi offload.

The alliance says that as the number of devices purchased from sources other than the mobile operator proliferates, established in-house testing methods are no longer enough.

It claims CWSC will enable carriers to test Wi-Fi services from end-to-end (provisioning and billing) against different equipment and credentials. The WBA reckons this removes issues prior to commercial release, ensuring a better customer experience.

For vendors, the programme means the end of "endless" testing with different carriers. Instead, they will now be able to test multiple devices across multiple carrier

networks, gaining time to market. The WBA adds they can also gain interoperability certification to validate carrier requirements in order to facilitate sales and save testing resources.

Going forward, the alliance plans to introduce new services such as: NGH in-line provisioning (secure SSID); policy interworking (ANDSF and HotSpot 2.0); QoS (end-to-end); Wi-Fi calling; and 5G interoperability (unlicensed integration).

**MANUFACTURER:**  
Wireless Broadband Alliance

**PRODUCT:** Carrier Wireless Service Certification

**MORE INFORMATION:**  
[www.wballiance.com](http://www.wballiance.com)

# Metacom claims Africa's most advanced enterprise router

Metacom claims it has come up with one of the most advanced enterprise routers currently available.

According to the South Africa-based commercial and industrial communications provider, the *MC6000* was developed using its 15 years of experience in the retail industry. It says the result is a

**MANUFACTURER:** Metacom

**PRODUCT:** MC6000

**MORE INFORMATION:**  
[www.metacom.co.za](http://www.metacom.co.za)

device capable of managing multiple services on a single hardware platform, across both remote and regional retail sites.

The company says its router can handle multiple fibre connections as well as ADSL, GSM and Wi-Fi for "seamless, speedy throughput". It also has HDMI connectivity so it can directly drive video.

Users can start with the basic router functionality and then add in services such as low-internet video or radio as they progress. The



*MC6000* includes expansion slots for internet video and radio, along with digital inputs and outputs.

Additional features include two SFP slots, support for 100BASE-LX, 100BASE-SX and 1.25G SFP modules, two USB ports, a 1GHz ARM iMX6S Cortex A9 processor, and a Wi-Fi module with support for multiple SSIDs and diversity antenna.

The *MC6000* also has dual power supplies for rural areas where reliable power is a challenge.

## Motorola promises uninterrupted radio coverage to keep teams connected

Motorola Solutions claims its *SLR 1000* repeater enables service providers to easily extend their network through dead zones and across remote locations so that everyone is within reach.

Unlike traditional repeaters, the firm says its new radio can be deployed outdoors or indoors

**MANUFACTURER:**  
Motorola Solutions

**PRODUCT:** SLR 1000

**MORE INFORMATION:**  
[www.motorolasolutions.com](http://www.motorolasolutions.com)

and offers the flexibility to be used in places such as parking garages, subway tunnels, and other potentially damp and wet locations. It is IP65 rated for dust and water protection, and its "compact" dimensions of 279.4 x 228.6 x 101.6mm are said to add to the ease of installation. Operating temperature is specified at -30° to 60°C.

Wherever the device is deployed, Motorola reckons users can put their "maintenance and repair worries aside", as a fanless design means less noise, less particulate intrusion, fewer components and all while delivering more coverage.

The *SLR 1000* has been designed to



work with both conventional and trunking systems that support voice and data, and has a frequency range of 400-527MHz.

The vendor says additional functionality is possible using optionally available accessories, such as a small mountable antenna, duplexer, or antenna switch for Extended Range Direct Mode. The latter also enables the use of the repeater in conventional systems.

## PCCW launches Restoration On Demand

PCCW Global has launched a new service that enables users to rapidly re-route their connections to an alternate network path in the event of an undersea cable failure.

**MANUFACTURER:** PCCW Global

**PRODUCT:**  
Restoration On Demand

**MORE INFORMATION:**  
[www.pccwglobal.com](http://www.pccwglobal.com)

*Restoration On Demand* leverages PCCW's SDN capabilities and "extensive" fibre network to enhance resilience and service performance in order to meet the needs of enterprises worldwide.

The service is charged for on a daily-usage basis and can be accessed via an online portal. Once activated, PCCW says the backup capability allows capacity to be provisioned automatically by its systems in near real-time and with no human intervention required.

Link setup, traffic restoration and billing are automatically activated.

Once the primary circuit has been repaired, customers can revert to their original cable service whenever they choose.



## ALSO LOOK OUT FOR

### Lasers used to alter optical properties

Scientists say they are one step closer to technology that could result in electrons being replaced with photons, solving the looming 'speed limit' for electronic gadgets.

According to researchers at Heriot-Watt University in Scotland, electronics have had such long-term success mainly due to how much smaller devices have become and how robust they are, even when made from a very limited number of fundamental materials. These last two features have traditionally been seen as weaknesses in photonics.

But for the first time, nanophotonics researchers have now shown how aluminium zinc oxide (AZO) reacts to light when simultaneously shined with ultra-fast laser pulses of different colours. Since AZO is a compound used in touchscreen technology, the discovery could have an immediate impact for the fabrication of novel photonic components.

The team used one laser beam to explore the optical properties of thin films of AZO, while two different trains of ultra-fast light pulsed at two distinct frequencies (or 'colours') were shone on the material. The experiments were conducted first by using one colour at a time, and afterwards with the combined use of the two laser sources.

It's claimed the recorded effects - which last for a 10,000th of a billionth of a second - revealed that it was possible to "drastically" and reversibly alter the optical properties of the material by using laser light with different colours.

"Each colour can induce strong and ultra-fast alteration on both the transparency of the material and the speed at which light propagates into it," says assistant professor Dr. Marcello Ferrera. "Electronics have almost reached their capacity and potential; our findings represent a remarkable step towards the full miniaturisation of photonic components."



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# Getting on top of smart cities

There has been a lot of talk about smart cities in recent years, but what's actually happening in Africa? RAHIEL NASIR finds out.

**K**igali is aiming to become a smart city model for other African nations to follow. And as reported in our last issue, it moved a step closer to that ambition with the launch of a government-backed IoT project featuring technology from Actility, Inmarsat and Nokia.

What's happening in the Rwandan capital is significant because although there is currently a great deal of talk about smart cities around the world, the reality in Africa is that nothing seems to have progressed beyond the disparate private sector IoT deployments, independent technology trials, and various PoCs being currently conducted. For instance in late 2013,

IBM opened its first research lab in Africa. With facilities in Nairobi and now also Johannesburg, the company said the lab gives researchers the ability to analyse and draw insight from vast amounts of data in the search for solutions to the continent's "most pressing challenges. So what has it achieved over the last four years?

IBM research scientists Tapiwa M. Chiwewe and Bonolo Mathibela say that the Kenyan and South African centres are focused on brownfield developments and smart hubs that are theme-based projects. These include using smart solutions to cover infrastructure gaps and single solution city-wide systems, such as IBM's

traffic optimisation and air quality management projects, for example.

"We have also been looking at adding intelligence to city microcosms which have all the characteristic city flows, such as waste, water, energy, people and goods, but at a smaller scale such as in airports, hospitals and campuses. For example, we are using machine learning and IoT technologies to ingest and learn from vast amounts of Big Data, including weather and pollutants, to create some of the world's most-accurate energy and environmental forecasting systems."

More specifically, Chiwewe and Mathibela explain that the researchers are using data from three

air quality monitoring networks in Johannesburg, Thswane, and the Vaal Triangle in South Africa. These provide forecasts for the following day, and the plan is to provide daily forecasts for up to seven days in advance to enable city officials to track down polluters and police them.

Citing reports from Frost & Sullivan, the scientists say Africa is expected to get five smart cities by 2030, including the USD14.5bn Konza Technology City development in Kenya which IBM is involved with.

Located 60km away from Nairobi, Konza is a flagship project that is part of the Kenya Vision 2030 initiative, and was initially conceived to capture the country's growing global business process outsourcing and IT services sectors. Development on the 5,000 acre site is currently ongoing, and when it is completed by 2030, Konza is expected to be the largest technology city in sub-Saharan Africa.

It will have an integrated urban ICT network that supports delivery of connected urban services and allows for efficient management of those services on a large scale. Data will be gathered from smart devices and sensors embedded in roadways, buildings and other assets. The collected data will then be shared via a smart communications system and analysed by software that delivers valuable information and digitally enhanced services to citizens. For example, roadway sensors will be able to monitor pedestrian and automobile traffic, and adjust traffic light timing accordingly to optimise traffic flows. Furthermore, Konza's population will have direct access to the data, enabling them to participate directly in city operations and practice more sustainable living patterns.

## Africa's unique challenges

While it is arguably comparatively easier to factor in smart city functionality with greenfield city developments, how can existing cities be made 'smart' using technological interventions?

In the words of Chris Mason, EMEA sales director and VP of business development at mesh wireless network specialist Rajant, the IoT cannot be brought to life without a robust infrastructure surrounding it. "IoT connects separate 'things' that we never imagined combined – such as a traffic light and artificial intelligence – which are able to come together to create something innovative. IoT has the potential

to transform businesses, changing the way they operate to keep up with growing competition."

According to Ammar Sabbagh, Ericsson's global principal consultant for smart sustainable cities, smart city transformation is a journey: "It starts with vision and then a proof of concept, then a trial, and finally a deployment. To build a smart city you need to have access to every corner of the city (parking areas, airports, malls, ports, streets, buildings) to deploy sensors and connect them to the IoT network. So connectivity plays a major role in any city planning to deploy smart solutions."

This is where network operators play their part.

As IBM points out, more people in developing countries have access to telecoms networks than to basic services such as electricity, running water and sewerage facilities. It says mobile broadband connections in Africa are set to increase from 20 to 60 per cent of the connection base by 2020, amounting to around 500 million connections. As a result, Chiwewe and Mathibela say this will be a key enabler for smarter cities as it will connect citizens to city leaders and the basic services that they require.

"In Rwanda, they have envisaged a unified platform to enable smart city solutions and are

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beginning to put together the required components for their health, education and transport systems to connect to it, share data and create end-to-end solutions. More than 4,500km of fibre optic cable has been rolled out across the country so far, with investment estimated at USD120m."

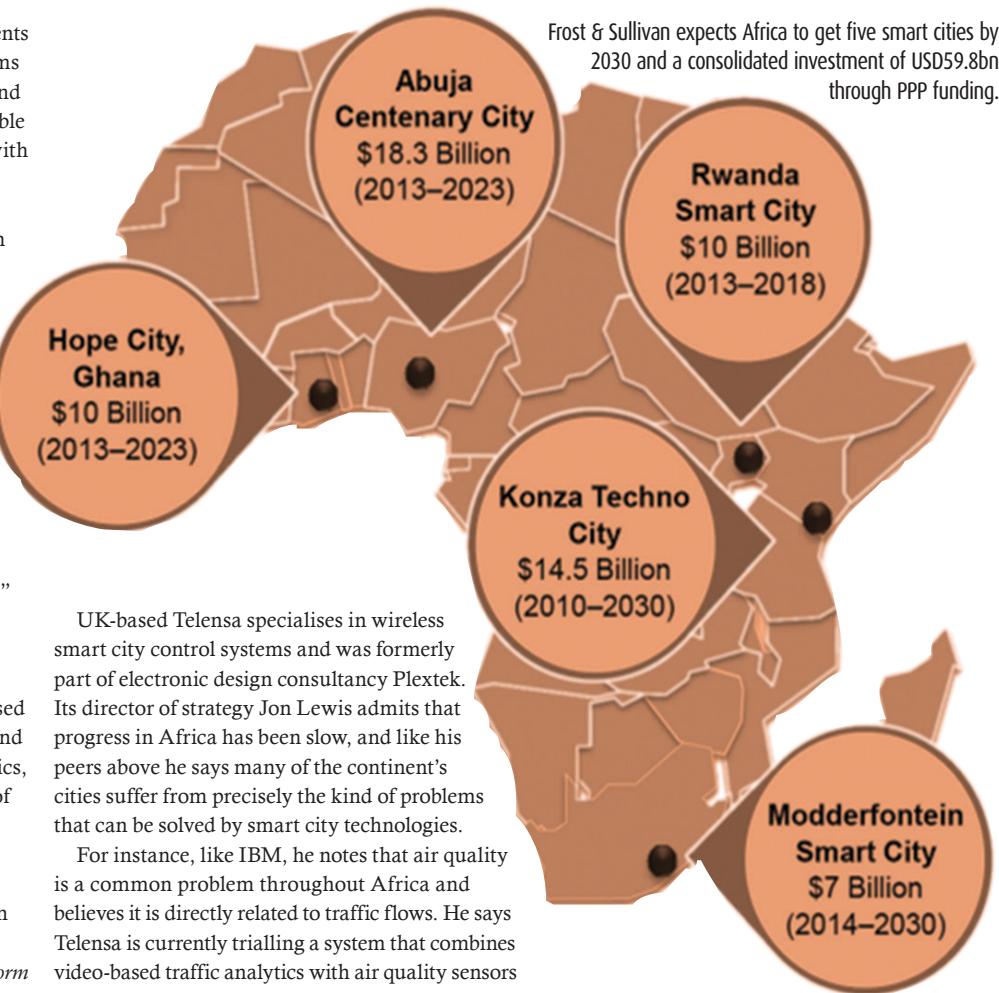
As a network operator, Vodacom's view is that the smart city ecosystem is modular. Deon Liebenberg, the company's managing executive for the IoT, says: "There are many examples of modular deployments in cities across Africa – from smart metering through to video analytics for security. The next phase of these modular executions is to combine the data in its entirety and to look at how it can be used in creative and different ways to establish smart communities and, eventually, fully integrated smart cities. Our focus should be placed on driving solutions to the socio and economic challenges that are unique to Africa."

Liebenberg adds that Vodacom recently launched a citizen engagement app to allow communities to report service delivery issues directly to their local municipalities. "User-based content such as this, being fed into platforms and complemented by sensors and Big Data analytics, will also contribute towards the development of smart communities and, in time, smart cities."

Nick Ehrke, Southern Africa sales director with wireless equipment specialist RADWIN, agrees that smart city solutions should focus on meeting the continent's unique challenges. He says: "In May, Rwanda hosted the third *Transform Africa Summit* that focused on developing smart cities. Smart cities aim to leverage technology solutions to improve the efficiency of cities in Africa. Specifically mentioned was the need to develop and roll out services like public Wi-Fi, as well as implement cashless payment systems. From this summit, it is apparent that the concept of a 'smart city' in Africa is simply the desire to develop our emerging continent to developed world standards."



IBM research scientist Bonolo Mathibela and her colleagues have developed a traffic optimisation tool that can help city officials dispatch traffic volunteers, known locally as 'pointsmen', to intersections where they're most needed due to unreliable traffic lights.



UK-based Telensa specialises in wireless smart city control systems and was formerly part of electronic design consultancy Plextek. Its director of strategy Jon Lewis admits that progress in Africa has been slow, and like his peers above he says many of the continent's cities suffer from precisely the kind of problems that can be solved by smart city technologies.

For instance, like IBM, he notes that air quality is a common problem throughout Africa and believes it is directly related to traffic flows. He says Telensa is currently trialling a system that combines video-based traffic analytics with air quality sensors in order to provide real-time, hyper-local data to help cities identify and reduce pollution.

The company is also assisting cities that suffer from power outages at peak times. "This is a problem that we help mitigate in several ways," says Lewis. "It includes providing improved control over street lighting, enabling dynamic dimming during periods of peak demand, and also a demand/response system that can be used to switch off electric water heaters under the control of the electricity utility."

"These are just two examples of how smart city technology can bring benefits by reducing electricity requirements at peak times, which in turn can help reduce the number of blackouts."

He adds that Telensa has deployed its first African smart lighting network for an unnamed West African country, but does not give further details.

When it comes to the IoT technologies that are used to deliver smart city services, Cisco Jasper points out there are a number of critical components that cities need to consider. (Cisco completed its acquisition of IoT platform provider Jasper earlier last year.) Sanjay Khatri, the company's head of platform product marketing, says: "In most cases, cities are likely to use a combination of several connectivity types (fixed/wireless, narrowband/broadband, licensed/unlicensed) given the diversity of smart applications. As a result, cities will also need common platform(s) for managing connectivity, data and hosting applications."

And as with all technologies, he says metro

Frost & Sullivan expects Africa to get five smart cities by 2030 and a consolidated investment of USD59.8bn through PPP funding.

authorities need to consider security and privacy: "This is not just about securing the connectivity and data (although those are critical). Cities also need to determine how they will handle the sharing of city data with private third parties."

During the planning stages, Khatri says Cisco Jasper has seen a number of best practices that can lead to success. He advises that the process should begin by assessing which areas of city life can be impacted with smart technology applications. "Planners should then develop a public-private partnership to address those opportunities. Start small, but keep your eye on where you want to grow eventually. And embrace open and standards-based solutions wherever possible."

## Smartening the city

While Khatri's advice is to "embrace open standards", when it comes to wireless communication technologies for enabling the IoT networks needed for creating smart cities, there seem plenty to choose from.

Industry body OneM2M was setup to develop technical specifications and architecture for machine-to-machine services and the IoT. Omar Elloumi, chair of the organisation's technical plenary, says it's all about covering the city with the right types of connectivity, from a low power wide access type of network through to pervasive fibre infrastructure for high bandwidth use cases.

"Each city will have its own priorities and vision; there is no one-size-fits-all approach, and deployment strategies will also differ. All cities will, however, share the common goal of cost efficiency, choice of technology, and secure handling of data that can be used to enrich the services offered to consumers."

Elloumi goes on to point out that there are certain capex and opex costs attached to deploying a specific technology, so limiting the number used should be an important goal for city planners. He says a "smarter" approach should be adopted to smart cities through what OneM2M describes as the "horizontal" approach. This enables different IoT use cases to be supported by the same platform. It differs from the "vertical" approach where cities might have several dedicated IoT platforms, such as one for smart metering, another for waste management, etc.

"Interoperability of this sort, where different apps can use the same device management and security software, or where sensor-generated data is put to multiple uses, can reap huge cost savings for city authorities, especially as apps and devices proliferate."

Narrowband RF mesh network specialist CyanConnode supports this view. In early 2015, it signed an agreement with XLink Communications for the distribution of its smart metering and lighting solutions as well as related IoT applications in South Africa. (As an aside, XLink is now 100 per cent owned by Vodacom, and in its latest trading update for 1Q17, the mobile operator reported that its IoT revenue in South Africa was up 28.9 per cent to ZAR192m (USD14.6m), and that it now had 3,100 IoT (M2M) connections in the country, a 23.3 per cent rise YoY.)

CyanConnode's SVP of global sales and marketing Geoff Sarney says having separate communication infrastructure for each application is costly so collaboration amongst stakeholders is key. He adds that also having a solution that can scale as the market and technology evolves will ensure that current and future services can be connected. "This phased approach allows stakeholders to leverage investment in one application, for example smart metering, to build-out smart city services."

Sarney continues by saying that one of the key challenges facing smart metering and IoT is the future sustainability of bandwidth at the frequencies needed to support solutions already deployed in certain countries.

"In parts of the spectrum currently used, there is a finite amount of bandwidth across which to send data. And with more devices being connected every year, the spectrum is filling up.

"One way to continue adding devices without further congesting the spectrum is to send information via lower bandwidth radio frequencies, or 'narrowband'. Narrowband RF technology is usually considered to cover frequencies 300 to 3400Hz and is sufficiently narrow that its frequency response can be considered flat."

Sarney explains that applications using

narrowband consume considerably less power (a key requirement for IoT applications) and are not as spectrum-intensive as those using higher frequencies such as 800MHz and above. As a result, he says narrowband RF networks enable significant growth in the number of connected devices and conserve valuable bandwidth.

Lewis adds to this by claiming that the investment required to roll out Telensa's ultra narrow band (UNB) network is "tiny". And once they have rolled out the network, he says authorities can try different applications in order to assess what mix of technologies works for them. "Purely in the context of smart street lighting, we would expect the network to pay for itself within four to six years from energy and maintenance savings alone. However, the payback time can be reduced to as little as two years if the city deploys other services over the network. Therefore, there should be no real financial barriers, and it is only the imagination and will of politicians that needs to be unlocked."

On the subject of spectrum, Lewis says UNB networks operate in license-exempt frequencies and use base stations that can be placed on street lights or low-cost poles. "Unlike mesh network technologies, which require complex installation and management, a UNB network can be installed in a matter of hours," he claims.

Naturally, the mesh specialists disagree here: "As experts in managing data communication our *Omnimesh* platform enables customers to build-as-you-go, cost effective networks," says Sarney. "[This is] ideal for smart cities, as gateways and devices can be deployed for the first application, such as smart metering, which creates coverage for future applications. This approach supports cash flow, uptime and verification of end to end efficiency."

Rajant's Mason adds his voice to the debate by saying: "Without a mobile, scalable, reliable wireless network that allows real-time data transfer, many parts of a city may be running on outdated data, or not be able to access data at all. Rajant *Kinetic Mesh* technology seamlessly integrates with existing communications infrastructure to support these highly varied users and needs."

## The right technology platform

There are several IoT technologies for connecting devices over long distances without internet connections. For instance, IBM says it was a founding member of the LoRA Alliance that promotes the use of *LoRaWAN*, a low power wide area network (LPWAN) specification intended for wireless battery operated 'things' in a regional, national or global network. Kigali's IoT deployment mentioned at the start of this article is based on a *LoRaWAN* platform.

Despite advice from the likes of oneM2M about minimising technology platforms in order to keep costs down and simplify deployments, the reality is that there will be a possibility for several networks to be implemented in a smart city since every corner of the metropolis needs to be covered, according to Ericsson's Sabbagh: "So we will see 4G/5G networks deployed for critical smart city applications, and LoRa and Sigfox or other low bandwidth connectivity options for non-critical applications."

IBM's Chiwewe and Mathibela say that more specifically in South Africa, companies are rolling out extensive IoT networks that make use of sub-gigahertz wireless communication such as LoRa, DASH7, amongst others. "SqwadNet, for example, already has 38 per cent population coverage and this is expected to grow to 85 per cent in the next year."

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SqwidNet is a subsidiary of South African open-access fibre connectivity provider DFA. It is the country's licensed operator of Sigfox, the France-based connectivity provider that has built a global IoT network.

RADWIN's Ehrke believes "without a doubt" that to create smart cities requires multiple technologies, including both wireless and wired systems. "Wireless systems will be used for a variety of applications, from metering systems, sensors, actuators and networking systems etc., through to mobile security, building connectivity and voice services. For any smart city to work, be beneficial and fulfil its promise, all these systems would need to work together."

Another M2M/IoT technology standard that has been around for a while now is Weightless. Developed by a special interest group (SIG) whose board members are Accenture, ARM, Sony Europe and Ubiik, the latest version of the standard was due to be officially launched in early August 2017.

It's claimed *Weightless-P* is an open standard for a high capacity LPWAN designed for performance. According to the SIG, when IoT connectivity technologies are being considered, users factor-in parameters like cost, battery life and range. While this is not wrong, the group says it is easy to overlook the importance of network capacity. "Capacity is not just about the number of simultaneously connected nodes," it states. "It is about mean data packet length, transmission time, frequency of transmissions and interference mitigation."

Alan Woolhouse, chair of the Weightless SIG's marketing working group, says a Weightless-based network is currently being deployed in Réunion. While he is unable to divulge further details, he says the operator there was aware of all the LPWAN options, such as LoRa and Sigfox, but opted for Weightless as it "ticked all the boxes".

"He didn't say exactly what these were but I can give you an outline of what the differences are," says Woolhouse. "*Weightless-P* is narrowband modulation scheme technology and *LoRaWAN* is a spread spectrum technology. What that means is that a LoRa data packet occupies the entire bandwidth available in ISM spectrum, whereas a narrowband scheme communicates in narrow channels. So you have a much higher spectral efficiency with a narrowband technology solution than you do with a spread spectrum solution, and that translates into higher network capacity. Very roughly – depending on different regulations and implementations – *Weightless-P* has 100x the capacity of *LoRaWAN* (that's based on a typical data packet size and a typical interval between transmissions)."

According to Woolhouse, *Weightless-P* "listens before it talks" and that enables it to schedule uplink traffic from end device to gateway. "If you can do that, you can guarantee that that piece of data will join the traffic stream in a way that avoids data collision."

He continues by saying that a few years ago Sigfox seemed destined to be the winner for LPWAN technology, and now *LoRaWAN* is in the ascendancy. "But today, people are generally fairly confident that NB-IoT is going to be a core technology that will prevail over the longer term. Weightless agrees with this, but we also feel that there is space for complementary, private network technology in unlicensed spectrum. The MNO's business model says there is much higher ARPU from people using their mobile phones to access *YouTube* videos than from a machine that might, once in a while, send a few bytes. So it makes sense to offload some of that traffic to a different network in the same way that 4G and Wi-Fi are complementary today. Weightless and NB-IoT will therefore be complementary."

Woolhouse adds that the two standards have exactly the same benefits. He also points out that Ubiik, the primary vendor of *Weightless-P* technology, and the 3GPP community have each chosen 12.5kHz as the channel width for their transmissions as this offers optimum performance. Furthermore, he emphasises that Weightless is a genuinely open standard: "The technology is available for developers to use on a FRAND and zero royalty free basis. That cannot be said for technologies like LoRa which use SEMTECH chipsets and chirp spread spectrum modulation schemes that are proprietary."

## Interoperability or bust?

Is the idea of a smart city doomed to failure if there are no agreed industry standards? "We see lot of broad-based initiatives stall due to lack of common technology and policy frameworks," says Cisco Jasper's Khatri. "So even as a city considers its first connected services, it should have a roadmap of future connected applications and outcomes it may want to pursue, and select technologies and platforms that will enable broader systems."

He adds that although most cities start with a single connected project, they must understand from the beginning that this isn't about enabling a single application: "Rather, it's about starting with a particular application to enable a specific outcome – while enabling future connected services. Ultimately, a fully-realised smart city consists of a range of applications that are interconnected and inter-dependent."

Khatri points out that where standardisation has to happen is at the data model and application enablement layer. Vodacom's Liebenberg agrees here when he says that it's all about the data that's used, as opposed to the devices being interoperable. "The devices don't necessarily interconnect – rather, it's the data that is extracted from those devices that creates the value positioning of a smart city. It's the way that the data joins dots that's important, not the devices interconnecting."

"Vodacom's Our view is that the smart city's success is based on how you use the data and

**Dr. Omar Elloumi,**  
Technical  
plenary chair,  
oneM2M



"Each city will have its own priorities and vision; there is no one-size-fits-all approach, and deployment strategies will also differ."

the outcomes of the data as well as the outcomes of the use cases which are implemented. For example, you could be collecting sensor data from traffic lights, you could be embellishing that with anonymised slow vehicle traffic and combining it with weather data to create a smart traffic flow."

For Ericsson's Sabbagh, there is no real requirement to have interoperability on the connectivity layer. He reckons the only need is to ensure everything is connected using 4G/5G, LoRa, fibre, Wi-Fi and other networks to create blanket coverage for the city. "There will be a data management layer that all data coming from different connected assets via different networks will use plus analysis all without the need to have any interoperability in the connectivity layer."

OneM2M concurs and says a smart city network will succeed if there is a platform that enables interoperability at a higher layer. "Most city planners contemplating a move from a 'stove pipe' to horizontal architecture will not want to disrupt legacy IoT implementations," says Elloumi. "Instead, they will want an integration path to bring existing rollouts on to the new platform."

He says oneM2M enables this through the use of adaptors, which can potentially interwork with any IoT wireless protocol in the field area network. These include LoRa, Sigfox, ZigBee, amongst others, as well as cellular-based LPWA systems such as NB-IoT, EC-GSM and LTE-M.

While Telesna's Lewis says standards will help to bring the IoT to consumers and will be useful in the smart city as more applications become available, he rejects the view that projects will fail without any industry agreed IoT standards.

"This should not be a reason to delay taking advantage of solutions today. Imagine if you were to put off buying a television 40 years ago because you wanted to wait for technology that you couldn't possibly have envisaged to be available. You would have been waiting for colour, then HD then 3D, then 4k. "The key thing to ask is whether technology will make a difference to my city today. And if it can and does, then you need to look for a reliable partner to deliver it." ■



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# Caring for a continent



NetHope and its partners provided vital communications technologies during the 2013-2015 Ebola crisis in West Africa. Here, an aid worker measures a woman's temperature at a road block in Lakka, Sierra Leone.

PHOTO: JULIA BROSKA

## Wireless technologies play a unique role across Africa when it comes to providing innovative healthcare solutions.

**D**evelopment in Africa has had a long history of Western influence which often doesn't address the continent's needs, according to Microsoft. It says that when it comes to health, community-developed programmes are far more successful. As a result, the company says it is seeing a boom in local health technologies tailored to fit the needs of the communities they're developed for. Many of these have been developed with Microsoft's help, and leverage the company's technologies.

For example, access.mobile was founded in 2011 and is a digital health company that aims to improve access to quality healthcare in emerging markets. With offices in Kenya, Uganda and the US, it is composed of an international team of healthcare professionals, software developers and social entrepreneurs. The company says it leverages mobile- and cloud-based technologies to strengthen the patient-provider relationship.

One of access.mobile's solutions is now being used in more than 100 health facilities in

Uganda, Kenya, Tanzania and Nigeria, reaching an estimated two million patients. *amHealth* is described as "affordable, secure and easy-to-use" technology that simplifies practice management and improves patient engagement. The software and app-based system includes a number of features designed for both patients and clinical practices.

For instance, staff can send messages to groups of patients regarding health information, disease outbreaks, marketing and health campaigns and loyalty schemes. Patients can also be easily contacted via SMS or email with customised, targeted messages, or to cancel or reschedule their appointments as needed. *amHealth* also includes automated medication reminders which are said to improve a patient's satisfaction and health outcomes by helping to increase medical adherence.

In terms of the latter, there are other SMS-based m-health projects in Kenya, Mozambique and Uganda that remind patients to take their medication and keep their appointments. Qualcomm has taken this a step further with one

of its *Wireless Reach* initiatives that was launched in Kenya in 2014.

Citing the CIA *World Factbook* at the time, Qualcomm said the HIV infection rate in Kenya was 6.3 per cent which meant around 2.6 million people in the country were living with HIV/AIDS. Offering free anti-retroviral therapy (ART) via clinics nationwide is a key element of the government's strategy to reduce HIV/AIDS-related morbidity and mortality.

However, ART requires continued treatment with anti-retroviral medicines ARV drugs, close monitoring of patient status and adherence, and an uninterrupted supply of critical pharmaceuticals. Prior to Qualcomm's project, healthcare workers at ART clinics manually tracked their ARV drugs, hand-wrote the reports that the Kenya Medical Supplies Agency (KMSA) requires in order to re-stock a clinic with the medication, and physically drove to the agency to submit the reports. Reports were often delayed, and many were incomplete, inaccurate or altogether missing.

The *Wireless Reach* project aimed to reduce the administrative burden on the healthcare workers, strengthen the pharmaceutical management systems for ART, and increase the efficiency and effectiveness of the delivery of ARVs to patients. This was achieved by equipping ART clinics in and around Nairobi with computer equipment, 3G data connectivity (which was based on Qualcomm's CDMA2000 Rev system at the time), and a new software tool. The latter was developed to track ART patient pharmaceutical information and help manage drug dispensations, and to automatically generate reports at each health centre. Qualcomm also trained and supported healthcare workers to use the new system.

The company said that the tool enabled healthcare workers to spend more time focusing on patient care. It's claimed that the timely submission of reports increased by 50 per cent, the average time to compile three monthly ART reports fell from 11.6 hours to 29 minutes, and that the average time spent on delivering the reports to the KMSA was reduced from eight hours to five minutes.

The project implementation was managed by Kenya's Provincial Medical Office (PMO) along with US-based non-profit research institute RTI International from its offices in Nairobi. The platform made use of open source software designed by RTI, which is derived from the manual recording system for managing anti-retroviral throughout Kenya.

In addition, the Communications Authority of Kenya (formerly the CCK) supported the acquisition and installation of computer hardware and software, amongst other accessories, in five health facilities in accordance with RTI's specifications. Dell also provided its *Vostro* desktop PCs and peripherals as a donation in support of the project.

The long-term goal is to produce a software and communication system that is locally sustainable and scalable to other health centres in Nairobi and other provinces. The upgrade will also facilitate online reporting to the KMSA and improve coordination between the health care centres, districts and the PMO. Ultimately, the same system could be extended to manage all pharmaceuticals in Kenya.



The Touch Foundation has launched a maternal health initiative in Tanzania that leverages mobile technologies from Vodafone/Vodacom. This includes the launch of a 999-style emergency line and an 'ambulance taxi' service to take women to hospital.

### Vodafone Foundation supports 'ambulance taxis'

A first-of-its-kind 'ambulance taxi' service launched by the Touch Foundation and its partners has reduced maternal mortality rates in its first year of operation in two Tanzanian districts.

The foundation works to improve the quantity and quality of healthcare workers, and enhance healthcare delivery in Tanzania which is said to have one of the world's highest maternal mortality rates. In July 2015, Touch and its partners – the Vodafone Foundation, USAID and Pathfinder International – launched the *Emergency Transportation System (EmTS)* in Sengerema and Shinyanga, two rural districts in the Lake Zone that are served by poor roads and just two hospitals.

*EmTS* is part of a wider maternal health programme that addresses what are said to be the three delays that lead to adverse outcomes for women and newborns facing obstetric and post-natal emergencies: the delay in seeking care; the delay in reaching care; and the delay in receiving quality care. Touch says the partnership with the

Vodafone Foundation allowed the programme to leverage investments made by Vodacom Tanzania to broaden mobile coverage and services in remote areas, ensuring that all segments of the population, regardless of location, are able to access the emergency system.

Vodacom Tanzania has also provided a dedicated toll-free number for people to request emergency transportation and access quality care. The emergency line includes a network of more than 100 taxi drivers who respond to emergency calls and take pregnant women on to the nearest hospital.

Sengerema and Shinyanga have a combined area the size of Belgium. That means a journey to a hospital can take three hours or more. But according to Vodafone, the distribution of the taxis ensures that they can reach the women up to 45 minutes quicker than one of the only 10 ambulances that serve a population of two million people in the two districts.

Once the women arrive at hospital, the emergency taxi drivers are paid using *M-Pesa* and at no cost to the passengers. Touch says the integration of Vodacom's mobile payment system into the

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dispatch application ensures automated, real-time payment to the drivers. It adds that this not only reduces the operational and administrative costs related to the management of financial flows, but also increases the interest of rural taxi drivers in participating in the programme.

In its *Mobilizing Maternal Health* report published in May 2017, Touch says that the *EmTS* service had transported 2,887 high-risk pregnant women in the two districts since being launched. That is equivalent to three times the number of emergencies transported prior to the service's inception.

The research analysed one full year of operations in the Sengerema district, during which 1,430 pregnant women experiencing an emergency were transported, reducing maternal mortality by 27 per cent and saving the lives of 57 women. Of those women transported and treated, 23 per cent came from communities where no transport system was available beforehand.

As part of the wider programme, a network of 250 community healthcare workers in Sengerema and Shinyanga have been taught Tanzania's newborn and child health curriculum, and an additional 209 healthcare workers have been trained in life-saving emergency obstetric and newborn care. A mobile app has also been developed for the workers, helping them to manage more than 10,000 pregnant women and identify high risk cases.

Touch's report concluded that running its maternal health programme in the Sengerema/Buchosa district would cost the Tanzanian government approximately USD2,000 per maternal life saved, and that the *EmTS* service has the potential to be scaled nationally.

## Selling medical dressings or buying a new dress?

Maisha Medical was founded in 2012 and aims to become the leader in the advanced wound care industry. It exclusively distributes *Drawtex* wound dressings into the South African state sector as well as to other selected African countries. Developed by South African manufacturer Beier Drawtex Healthcare, *Drawtex* is said to be the first hydroconductive wound dressing that features patented technology to aid effective wound bed preparation without damaging newly formed tissue.

To support its distribution operation, Maisha has a sales team of around 13 staff who are in the field for at least 90 per cent of their time, visiting government hospitals and clinics throughout the length and breadth of South Africa.

Each salesperson is given what the company describes as a "considerable" amount of petty cash per month to sustain their activities within their regions. This money is used for fuel, accommodation, hospital events, and general expenses.

Maisha wanted to ensure that its itinerant staff were visiting the correct hospitals, and using their expenses budget appropriately. Furthermore, the company's national sales manager Nick Tyolo says he needed to see where team members were at any given point, how long they spent with



Netcare operates an extensive network of private and semi-private hospitals across South Africa, and aims to provide advanced healthcare services powered by innovative technology and training.

clients, and what orders could materialise as a result of each visit.

As with most public sector organisations all over the world, purchasing supplies is not easy. While clinicians may need specific dressings, all orders have to go through a government-approved procurement system. "But if we know a specific unit has an urgent need for, say, burn dressings, we can follow up with the procurement officers to expedite the order," says Tyolo. "I need to know this information and to check my team is really visiting the customers as required."

The solution to all these challenges came in the form of a GPS-based tracking system from Econz Wireless. Each salesperson now carries a tablet with the *Econz Timecard GPS* system on it – anyone who switches it off while on the job, is at the wrong hospital, or not out in the field at all, will be tracked to within 10 metres of where they should be.

Since introducing *Timecard*, Maisha office manager Johan Minnie says he can spot a fraudulent claim immediately. For instance, all the sales reps must start work either before or by 8am. This is due to doctors doing their rounds in the early mornings, and it is usually then that they know what supplies will be needed. Working in South Africa's state medical sector regularly includes visits to wound clinics where meals or snacks are provided afterwards. As a result, expense claims for food in the late afternoon are regarded as suspicious. Minnie says: "Now I can see exactly where the rep went after the hospital – if she went shopping, picked up an expensive takeout meal, what else was purchased, and where and how long was spent shopping."

"We can even pick up fraudulent claims for fuel – if the rep is driving a car (and we know them all) that has a 60 litre fuel tank, a claim for 120 litres at the same petrol station at the same time, means a second vehicle is involved."

Tyolo says the use of *Timecard GPS* and the ability to track staff has given the company real peace of mind. "We now know they have definitely visited the correct place at the required time, and sent us a sales report about product needs. We can see they are on the job, have taken the best route, and are there long enough from when they clock out."

Along with being able to track staff, *Timecard GPS* has given Maisha's managers accurate time

and attendance records, saved on fuel costs, and increased sales productivity. Minnie says that even log books are now on time and automated.

Staying in South Africa, Netcare operates an extensive network of private and semi-private hospitals across the country. It has been making large investments in providing next-generation services as part of its mission to deliver quality care and professional excellence.

To help realise its vision for advanced healthcare services powered by innovative technology solutions, Netcare needed wireless infrastructure that could be owned and controlled centrally. This meant securely connecting two separate networks in each hospital – the LAN and the Wi-Fi.

Furthermore, the infrastructure needed to have high levels of security to protect extremely sensitive personal information. Without a budget for this particular technology project, Netcare had to look at ways of using its existing infrastructure and investments in order to meet business demands. This is where Johannesburg-based data centre, cloud, and internet services provider, Internet Solutions, came in.

By using some of the company's legacy infrastructure, Internet Solutions says it developed a firewall and Wi-Fi hotspot architecture that could deliver connectivity to all employees that were authorised to access the service. A Fortinet firewall was installed at each hospital location to securely link the two networks, so employees could log in from anywhere using a single sign-on, whether they were at their desks or on the move in the building. Internet Solutions proposed a fully managed service and provides complete support for all firewalls.

The company says that by being able to connect to applications from anywhere in the hospital, Netcare staff are able to deliver a more efficient service to their patients. In addition, visitors to the hospital now have access to public Wi-Fi services via Internet Solutions' sister company, *AlwaysOn*, all as part of the same solution.

Internet Solutions reckons that Netcare is now in the "perfect" position to continue investing in next-generation solutions that will improve the quality of care it can offer patients. The company claims its architecture enables the health services provider to take advantage of innovative cloud technologies without requiring additional fibre infrastructure.

## Helping to defeat Ebola with comms and connectivity

NetHope is a non-profit US-based organisation that aims to make a difference through technological innovation. Its many members include other international NGOs, such as Grameen Foundation, the International Federation of Red Cross and Red Crescent Societies, Inveneo, Islamic Relief, Plan International, *et al*, while Cisco, Google, and the Bill and Melinda Gates Foundation are among those listed as technology partners and supporters.

At the end of 2013, West Africa began to be hit by what would become the largest Ebola outbreak that the world had so far seen. It reportedly had a 60 per cent fatality rate for those infected. Towards the end of 2015, the World Health Organisation declared that Sierra Leone, Guinea and Liberia – the three countries that had the most cases confirmed – were now Ebola-free, but by then the epidemic had claimed more than 11,310 lives, according to the Centers for Disease Control and Prevention.

NetHope says that fear of the virus was exacerbated by a severe lack of communications capacity when and where it was most needed during the outbreak. In collaboration with its partners, the organisation acted as a rapid first responder in affected countries, providing much-needed communications equipment and deploying connectivity solutions. All this proved

to be crucial in unifying disparate sources of humanitarian care and ensured that those afflicted were efficiently cared for.

NetHope also provided 11 metric tons of mobile satellite terminals, VSATs, and satellite phones that enabled government and non-profit Ebola responders to communicate instantly with each other and the rest of the world. The organisation says this effort was directly responsible for the effective, coordinated delivery of healthcare services, food, water, shelter services, and the timely flow of the critical data needed to understand, and ultimately contain, the outbreak.

Additionally, in partnership with crisis informatics experts, NetHope provided critical visualisations of mobile networks, a map of Ebola treatment units, the trajectory of new outbreaks and their relationship to mobile coverage areas. It says this meant that those in need of care were able to receive it quickly and that providers were prepared to receive them, preventing further spread of the virus to other individuals. 100 digital volunteers were mobilised to provide informatics mappings to aid deliverers.

As a result of all its support, NetHope boosted the bandwidth of 44 locations and implemented brand new setups in 32 sites, rapidly responding where infection was most prevalent and spreading the fastest.

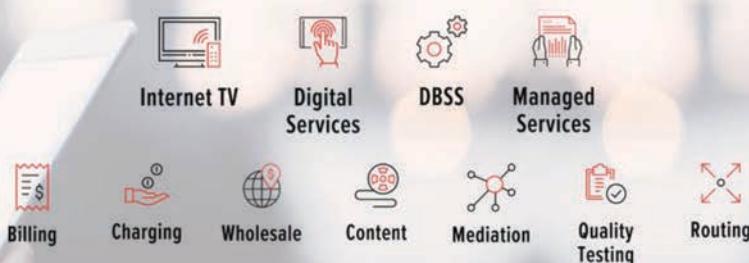
Communications tools acted as a lifeline for



Maisha Medical exclusively supplies Beier Drawtex Healthcare's patented hydroconductive wound dressings to state hospitals in South Africa. It is using GPS to track its sales reps across the country.

Ebola emergency responders, serving an estimated 22 million beneficiaries. More than 65 responding organisations were served with mobile, satellite and point-to-point connectivity solutions that supported an estimated 5,000 staff members. ■

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# Welcome to the fourth industrial revolution

Against a backdrop of Industry 4.0 trends, PROFESSOR ANTONIE VAN RENSBURG discusses the importance of understanding AI's role in realising self-adaptive cognitive communication networks.

**T**he world is standing at the cusp of the next great industrial revolution. This phase of transition builds on the third industrial revolution, when information and communication technology was introduced, bringing digital capabilities to billions of people and fundamentally altering global industry.

Digitisation has also accelerated the rate of technology-mediated innovation and advancement. This has been the catalyst for the exponential pace at which mankind has ushered in the fourth industrial revolution.

Also referred to as 'industry 4.0', this next phase of transition will fundamentally change the way we live and work by weaving technology into every sphere of life, with the fourth industrial revolution characterised by a blurring of the lines between digital and physical systems.

Our view, from an analytical perspective, is based on the premise that in the new digital economy, companies will need to convert their physical world – processes and operations – into digitised variants. In this digitised future, machines will talk to machines, helping to make complicated decisions and manage day-to-day operations.

This revolution has, of course, been sensationalised a great deal, with fears that artificial intelligence (AI) will advance to such an extent that technology will surpass mankind's collective intelligence and pose a risk to our existence.

While the potential certainly exists that industry 4.0 technologies will replace many jobs, we cannot yet exactly forecast how this new industry paradigm will unfold. It's important

to understand that industry 4.0 is being shaped and driven by humans. We therefore have the opportunity to determine how people and technology will fuse together to enhance business and drive innovation.

In its current state, the fourth industrial revolution is unfolding as an iterative process whereby humans continue to combine computers, robotics and automation in entirely new ways, driven by data analytics, smart devices and big data. This is what is generally considered to be the contemporary understanding of AI, rather than the sci-fi inspired vision of anthropomorphic machines taking over the world.

In this latest iteration of industrial evolution, connected computer systems have been equipped with algorithms that are able to learn and control equipment and hardware in various industries, with very little input from human operators, outside of the initial programming requirements. This has created great potential to optimise the workplace in every vertical industry, including wireless communications.

However, what companies need to understand is that industry 4.0 technologies are not a catch-all for businesses on the path to digital transformation. Often, only certain technologies are applicable, even AI. That's because at present, AI operates most effectively within its defined parameters and trained boundaries. This renders it ineffective when dealing with unknowns that it has not been trained on, such as the unpredictability of human behaviour.

Furthermore, AI at its core is a classification algorithm. As such, it is not capable of predicting time-based events. In this case, network operators need to select machine learning algorithms that can deal with big data forecasting requirements so that the system can, for example, pre-empt shifts in the demand for network capacity.

However, AI is already capable of autonomously determining optimal system configurations based on prevailing conditions. With this real-time input, an intelligent network system can then

quickly access and compute millions of historical data points to determine the most appropriate decisions and actions to improve network efficiency. The system is even capable of notifying the network operator when certain hardware or software components are most likely to fail.

## 'Intelligent pricing'

Based on these capabilities, the real and present business problems that AI can solve in the wireless communication industry are the issues of enhanced operational performance and revenue optimisation. These are particularly pertinent in the face of growing mobile data demand and dwindling airtime revenue.

In terms of revenue optimisation, this can be achieved through a real-time decision-making technique called 'intelligent pricing'. This is a combination of AI and machine learning which assists next-generation wireless networks through the intelligent adaptive learning of customer behaviour. It supports network operators by helping to better manage growing data throughput rates and accommodate trends such as application abundance to meet the rapidly evolving requirements of mobile users.

However, intelligent pricing requires revenue optimisation to be balanced against network performance. AI is capable of resolving the conflict between revenue and performance with smart solutions that deliver optimised quality of experience. It can shift traditional network management models, like load balancing, to ensure low latency and application and content provisioning, thereby accommodating data-intensive applications, services and rich multimedia digital content.

Current implementations have shown that these AI-driven machine learning capabilities can deliver immediate improvements for mobile network operators, with a three to five per cent lift in revenue, and a 25 per cent reduction in customer churn.



Machine learning is also being touted as one of the most promising industry 4.0 tools for its ability to maximise resource utilisation. By supporting smart infrastructure, machine learning algorithms have the ability to autonomously assess and optimise spectral efficiency through analysis and learning, and subsequently control transmission power and adjust protocols.

## COBANETS

With the number of wireless internet-enabled devices expected to exceed 50 billion by 2020, it is imperative that mobile network operators find flexible ways to better manage the scarce resource that is spectrum and utilise it more efficiently. Improved network efficiency through machine learning can also prolong the lifespan of current and future networks, ensuring infrastructure capex delivers a greater return on investment to further bolster the balance sheets of mobile network operators.

Beyond these immediate applications, mobile network operators are already working to combine machine learning and neural networks to build cognitive radio and bio-inspired networks. These self-adaptive cognitive networks will perceive current network conditions and will be capable of dynamically reconfiguring themselves to plan, decide and act on those conditions.

Referred to as cognition-based networks or COBANETS, the systematic application of advanced machine learning techniques used in the development of this network architecture leverages unsupervised deep learning and probabilistic generative models for system-wide learning, modelling, optimisation, and data representation. When combined with emerging network virtualisation capabilities, COBANETS make it possible to actuate automatic optimisation and reconfiguration at the system level.

Other compelling applications of industry 4.0 technologies in intelligent wireless networks include cognitive radios, MIMO antenna technology, small cells, hetnets, smart grids, energy harvesting, and device-to-device communications.

However, before any of these capabilities are realised, it is important that companies first tackle the greatest impediment to industry 4.0, namely human bias and our fear of the unknown. Currently, executives may be hesitant to hand

over the responsibility for even small aspects of decision making to machines.

Whether this hesitancy is based on rational concerns around a company's digitisation strategy, or an irrational fear of AI that is predicated on a lack of understanding of the concept, the fact remains that the fourth industrial revolution has begun.

Those companies that embrace relevant industry 4.0 technologies stand to benefit greatly from their abilities to make complex decisions much faster, based on a computer system's ability to analyse more data points and process a great deal more information.

Of course, there are still limitations to what artificial intelligence can enable in the current context, and an AI engine will only be as good as the data it is fed. However, these capabilities are rapidly advancing, and any company that isn't at least considering its roadmap to an AI-enabled future risks being disrupted and rendered irrelevant in the modern digital economy. ■

*4Sight Holdings is a diversified holding firm that invests in industry 4.0 technology companies. It recently acquired Mauritius-headquartered Digitata Group (see Wireless Business, Sep-Oct issue).*

The advertisement features a large globe with a network of red and blue lines representing WIOCC's global connectivity. A blue banner wraps around the globe with the text "Complex challenges - Solutions made simple". A red banner at the bottom right says "Delivering connectivity you can trust". The WIOCC logo is at the bottom left, and a red banner at the bottom right contains the website address "www.wiocc.net".

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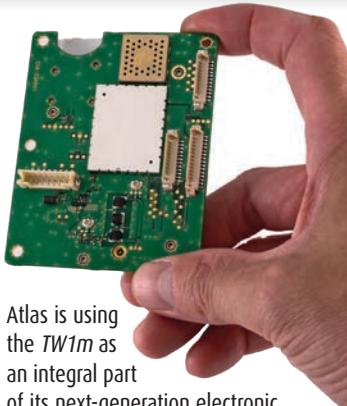
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Atlas is using the *TW1m* as an integral part of its next-generation electronic verification system.

PHOTO: © AIRBUS

## TETRA modem aids security in the Emirates

 Atlas is using TETRA to transmit information about vessels located off the UAE coast as an instrumental part of its next-generation electronic verification system.

The telco is using Airbus' latest *TW1m* TETRA modem to integrate confidential data, such as GPS positioning and text messages, into its vessel identification system which is run by a government agency. The system consists of radars, long range cameras, e-passport trackers, location and correlation servers, as well as command and control systems. Atlas has been operating the first generation of this technology since around 2007 and is planning to establish a new scheme soon.

The *TW1m* contributes to the tracking and identification of registered and un-registered ships off the UAE coast. Airbus claims it is an "extremely secure" solution, especially when other communication systems are not in operation. The company says the modem transmits voice and data safely thanks to end-to-end encryption and can be incorporated in supervisory systems, custom telemetry and position tracking.

"Our components meet all the essential specifications set by the UAE government institutions", says Selim Bouri, head of Middle East for Secure Land Communications at Airbus.

He also points out that Middle Eastern markets are increasingly "pathbreaking" for the entire professional mobile radio industry worldwide.

# Openwave helps Zain with "darkening" networks



Zain Saudi Arabia has deployed an NFV-based solution from Openwave Mobility to manage rising levels of encrypted mobile data traffic on its network.

According to Openwave, encrypted data from OTT services is "darkening" networks. It says this is preventing operators from being able to gain insight into mobile traffic to manage QoE. The firm adds that in some parts of the world, more than 60 per cent of data is encrypted and that this could reach 80 per cent before the end of 2017.

Khalid Charaa, core planning senior manager for Zain Saudi Arabia, says: "We have seen a sharp rise in HTTPS and QUIC traffic over the past few months, and proactively took steps to find solutions that could ease congestion and deliver superb QoE."

By using Openwave's virtualised solution, the operator aims to manage and monetise encrypted data including streaming videos, and deliver what the vendor describes as "outstanding" quality of experience for customers.

Indranil Chatterjee, SVP of product and sales at Openwave Mobility, says more than 50 per cent of data travelling on mobile networks is video. He believes that this is straining networks and, along with encrypted data, adversely impacts QoE.

"Our research has shown that subscribers will only tolerate six seconds of buffering before they abandon their video and even consider leaving their operators," says Chatterjee. "In a highly competitive mobile landscape, carriers can ill-afford to overlook quality."

## Coriant to enhance Vogel national network



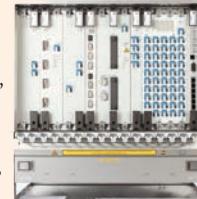
Vogel Telecom has selected an integrated OTN switching and coherent optical transport platform from Coriant to scale its nationwide backbone network. The Brazilian 'carrier's carrier' also expects the system to enhance the delivery of flexible end-user services, including Ethernet, MPLS-TP and SDH.

Vogel's national network infrastructure spans more than 21,000km of fibre and supports high-capacity connectivity services across more than 600 cities in 13 states as well as the Federal District of Brasilia.

The new national backbone project covers over 4,000km of fibre

transmission and connects the states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Minas Gerais and Rio de Janeiro. Coriant says the end-to-end solution, which extends from metro to long haul network segments, supports up to 5Tbps of capacity and is designed to support up to 1Tbps in the future as demand evolves.

Products deployed include: Coriant's 7100 pico packet optical transport platform for metro access; *mTera* universal transport platform for agnostic service aggregation and OTN switching; and the



*hiT 7300* (pictured) multi-haul transport platform for long haul coherent DWDM transmission.

According to the vendor, its system will provide Vogel with "seamless interworking and efficient service hand-offs" between metro, core and long haul domains. The firm also claims its platform will lead to "significant improvements" in network operations, while enabling "faster and more cost-effective" creation of resilient, high-speed services optimised for end-user application demands.

## Ericsson helps steer solar race car to victory



Solar Team Eindhoven (STE) once again used Ericsson's technology for its sun-powered race car in the World Solar Challenge 2017.

At the time of writing, this year's competition had just ended and saw 17 teams race 3,022km through the Australian outback with the sun as the only source of energy for their cars. STE came top in the Cruiser Class with their *Stella Vie* solar car, making it their third victory in a row at the biennial event.

STE is a multidisciplinary team of 21 students from the Technical University Eindhoven. In 2015, they worked with Ericsson on their *Stella Lux* car which was built using the vendor's IoT platform. The vehicle used Ericsson's *Solar Navigator* application to aggregate in-car, traffic

and weather data to perform in-depth analytics and optimise the route.

For 2017, *Stella Vie* was upgraded with a re-designed *Solar Navigator* application. Ericsson says this now takes height profile maps into account, finds the most-efficient route, and shows drivers how much energy is saved compared to a standard, fossil fuel-powered car.

According to the company, its technology helped STE to stay ahead by ensuring that unnecessary acceleration was avoided by optimising routes around traffic congestion and by taking traffic flows into account.

By considering local weather conditions along the route, the application also enabled the best energy contribution of the solar panels



Solar Team Eindhoven claimed a third victory in the World Solar Challenge in their sun-powered car, *Stella Vie*.

PHOTO: TU EINDHOVEN/BART VAN OVERBEEK

and lowest resistance from rainfall, as well as suggesting an optimal route to harness the power of the sun.

Ericsson adds that in-car energy levels were also continuously monitored to predict the range and energy levels at destination.

# Moving Wireless Forward

Mobile Mark is a leading supplier of innovative, high performance antennas to wireless companies across the globe. We've been in the wireless industry for over 30 years and have our roots in the early Cellular trials. We have grown and evolved over the years, along with the industry.

Today, we benefit from enhanced design capabilities and expanded production capacity – along with a greater understanding of new and emerging markets – all of which have allowed us to become one of the best antenna developers in our field.

Our customers have been our partners throughout the years. We believe in taking the time to understand our customers' individual needs. Through close consultation with clients, we are able to deliver innovative, tailored solutions that meet specific antenna requirements.

Rapid prototyping capabilities allow us to take our designs from concept to reality in an extremely short time span, and to verify the performance of the antenna. A variety of network analyzers and an anechoic chamber enable us to conduct measurements up to 13 GHz, and ensure that the antennas designed meet or exceed customer requirements.

We have onsite injection molding equipment and a fully equipped modeling shop staffed with skilled model makers to assist in the design phase and help us come up with a superior product – an antenna that not only meets the customer's electrical specifications, but is also very attractively packaged.

Mobile Mark antennas are used in many sectors of the wireless industry. Here are just a few examples:

## Asset Tracking & RFID

Managing and tracking important assets can be a challenge in the field, and both RFID and WiFi offer effective wireless solutions. WiFi / WiFi technology allows us to identify, monitor and track items ranging from medicine to fruit to parcels to people. Since each application has its own challenges, Mobile Mark offers a range of antennas so network developers can choose the right mix.



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## Commercial Fleet Management

Mobile Mark has consistently lead the industry with the most extensive and innovative range of antenna solutions that combine multiple wireless technologies: from simple GPS & Cellular antennas to complex 6-cable antennas combining LTE MIMO, WiFi MIMO, DSRC and GNSS in the same antenna housing. This combination of wireless technologies allows fleet owners to track and/or redirect their fleets of cars and trucks for optimum efficiencies. Mobile Mark antennas are rugged enough to handle tough environments and efficient enough to maintain reliable connections.

## Public Transit & Bus Management

From monitoring the location of the bus to monitoring the condition of its tires, wireless has become an essential part of professional bus management. Mobile Mark's multiband antennas allow the system to capture that information and transmit it back to a central monitoring station with real-time connectivity. For an added touch, real-time WiFi service can also be added for the passengers. That's why companies like INIT have selected Mobile Mark antenna to complete their product offerings. And they have made the following endorsement:

"INIT GmbH – as a worldwide leading supplier of integrated planning, dispatching, telematics and ticketing systems for buses and trains – uses Mobile Mark bus antennas in public transportation projects all over the globe.

For example: INIT has installed Mobile Mark antennas in projects located in Abu Dhabi, Hertfordshire UK, Turku Finland, Oslo Norway, Montreal Canada, Luxembourg, as well as several German projects.

In 2017, a fleet of more than 1,500 buses will have Mobile Mark Antennas installed in one of INIT's

current major projects for National Express, West Midlands, UK."

## Remote Monitoring & Surveillance

Surveillance plays an important role in maintaining secure settings. Network deployments need to be low maintenance and weather resistant. Broadband surface mounts offer flexibility for multi-frequency coverage and are rugged and dependable. YAGI antennas provide practical point-to-point coverage. Our antenna solutions are designed to handle tough conditions while providing the reliable wireless connection you would expect from a Mobile Mark antenna.

## Mining & Exploration

Modern mining operations rely on a battalion of vehicles, ranging from massive extraction vehicles to modest-sized material transport trucks. These vehicles operate in tough environments where high vibration is a frequent wear and tear challenge. Mining companies throughout Africa have relied on our rugged, foam-filled mobile antennas for consistent connections. Mobile Mark's infrastructure antennas have been used for rapid deployment and redundancy coverage for effective wireless coverage in isolated settings.

## Smart Cities & Smart Highway

For cities and highways, the lynchpin of a successful "Smart" system will be dependable wireless connections. Companies like Kapsch understand this, and have worked with Mobile Mark to find ideal antenna solutions. Wireless networks must reach seamlessly into hard-to-cover corners of city intersections and along vast expanses of highways. They must be carefully embedded in city lighting and electrical meters. Mobile Mark offers both small network infrastructure as well as embedded antenna elements to help network designers tie all the pieces together.

## Let us know how we can help

We understand the RF wireless world and are ready to help you evaluate your options. Contact us by email, phone or fax and let us know how we can help.

Mobile Mark Europe Ltd

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## First steps to DTH

 Ukraine's State Space Agency, UkrCosmos, is now offering satellite transponder services for content sharing to the country's regional broadcasters. Utilising Spacecom's *AMOS-7* satellite at the 4°W prime orbital position, the agency is starting with an initial 19 regional channels on the bouquet, which includes 13 SD and six HD, reaching throughout Ukraine. Spacecom says that joining the bouquet will enable most of the region's broadcasters to take the first step towards creating a digital DTH platform.

## NB-IoT smart meter

 Huawei says it has developed the first NB-IoT smart meter. EDP Distribuição is using the technology for a pilot project in the Parque das Nações area in Lisbon as part of the UPGRID project of the EC's *Horizon 2020 Programme*. The area is already covered by NB-IoT and has been equipped with two base stations provided by NOS, which becomes the first operator in Portugal to test 4.5G-IoT technology on its network infrastructure. Around 100 customers will take part in the pilot which runs until the end of the year.

## TETRA on Titicaca

 Hytera is delivering a turnkey video surveillance and mission critical network in Puno. The Peruvian city is on the shores of Lake Titicaca at an altitude of over 3,800m, and one of its greatest attractions are the Uros Floating Islands. This and its proximity to the Bolivian border means that it is a regular stop on the South American tourist trail. To ensure security, the city authorities will deploy Hytera's *DIB-R5* outdoor TETRA base station, *PT580H Plus* portable and *MT680 Plus* mobile radios, as well as a command and control centre equipped with *AVL/APL* and dispatcher consoles.

# IoT and GPS enable Mobike to manage smart cycles



Cycle sharing service Mobike will use IoT solutions to support its station-free smart bikes in the US.

AT&T's 4G connectivity combined with Qualcomm's LTE IoT modems and Mobike's smartphone app will enable users to locate, unlock and securely pay for the nearest available cycle. At the end of their ride, they will be able to return the bike to a designated Mobike location or any regular cycle parking area.

Mobike says it currently manages more than seven million smart cycles across more than 160 cities globally. They feature the company's smart

lock which is enabled by Qualcomm's *MDM9206* global multimode modem. It features LTE IoT connectivity and GNSS position-location capability to help customers identify an available bike, quickly unlock the smart lock, and assist with real-time management.



Mobike's bicycles feature a smart lock that is enabled by Qualcomm's *MDM9206* LTE IoT modem.

Since the entire fleet is GPS-enabled, Mobike says it can get cycles to locations where they are needed most. During high demand, it can even offer app users incentives to move bikes from remote areas to more populous parts of the city.

The entire system also provides continuous monitoring of the bike's status, and AT&T's network will enable Mobike to capture detailed usage data from every bike.

"By providing IoT connectivity for Mobike, we're advancing both the sharing economy and the future of smart cities in a meaningful way," says Chris Penrose, president, IoT solutions, AT&T.

## G+D enables finance group to provide mobile payment for savings banks



The German Savings Banks Finance Group has begun to test a mobile payment solution ahead of its planned launch in 2018.

The platform has been developed by S-Payment, a subsidiary of the Deutscher Sparkassen Verlag (DSV) group. A two-month pilot programme with ten issuing savings banks went live in September with G+D Mobile Security providing token aggregation as a managed service and the mobile wallet.

The firm connects the banks with the Mastercard Digital Enablement Service (MDES). Test users have a wallet app installed on their smartphones. After registration and authentication, the selected Mastercard credit card is tokenised using G+D Mobile Security's *Convego CloudPay* service connected with MDES. This manages the OTA provisioning of the virtual card (token) to the wallet and can support any subsequent lifecycle management requirements, says G+D.

Once authenticated, users can make mobile payments at any contactless POS terminal that supports Mastercard.

G+D Mobile Security describes the Savings Banks Finance Group's rollout of mobile payment as "ground-breaking".

It also claims that the use of its technology has enabled S-Payment to provide its service to the banks selected for the pilot with "minimum efforts".

## Emergency system trials as volcano erupts



Mobile phone software that allows communication without relying on network coverage had its first real world trial at the end of September following a volcanic eruption on the island of Ambae in Vanuatu.

*Serval Software* was developed by a team led by Dr. Paul Gardner-Stephen at Flinders University in South Australia. It doesn't require tower infrastructure and instead harnesses a 'meshed' network of phones connected to small extender devices (see *World News*, May-June 2016 issue).

When Gardner-Stephen and his team arrived in Ambae to put *Serval Software* to the test on 29 September, Manaro Volcano continued to spurt plumes of smoke, ash and rock. A full evacuation

was ordered, and the eruption left the island almost completely disconnected from the rest of the region.

The team had installed five mesh extenders in the Efate Island village of Pang Pang on a previous trip. The small village is only around a kilometre long and lacks mobile phone coverage. Gardner-Stephen and his team are now working to test the devices in real conditions. He says: "The mesh extenders are just hammered onto a piece of wood and stuck on the side of a house. We've tied them on coconut palms and people can carry them around in a backpack."

He adds that the project is looking to boost its presence in Vanuatu by working with local operators. "Our



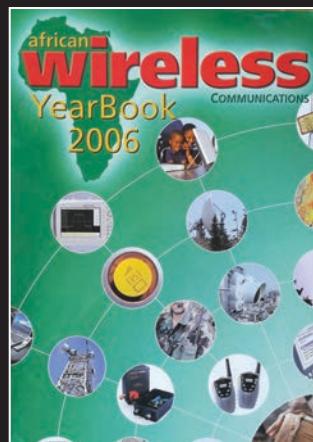
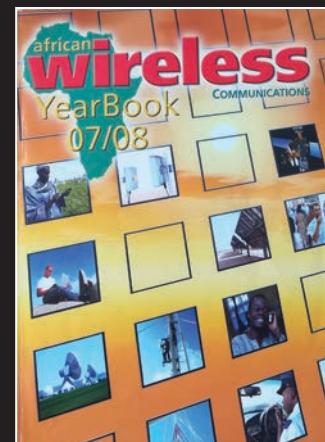
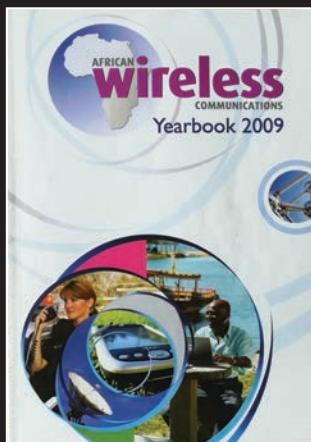
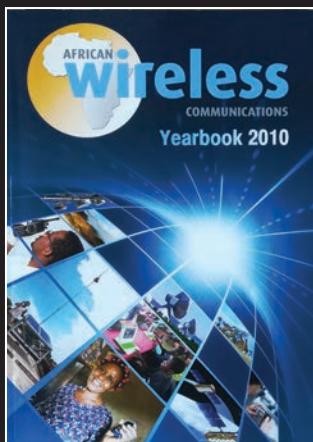
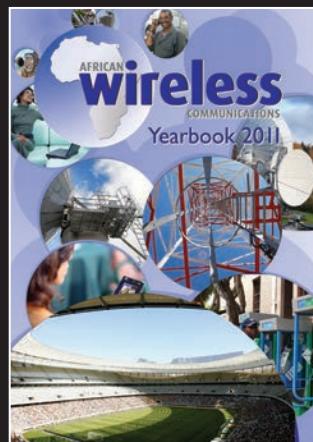
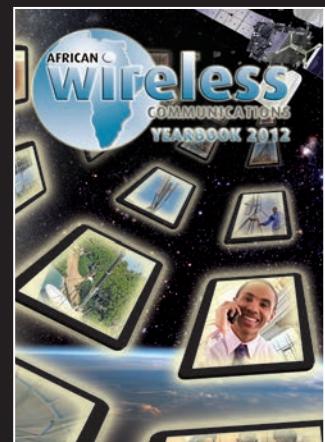
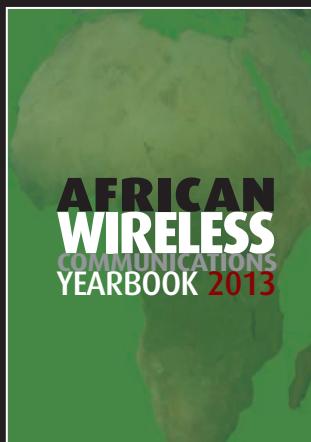
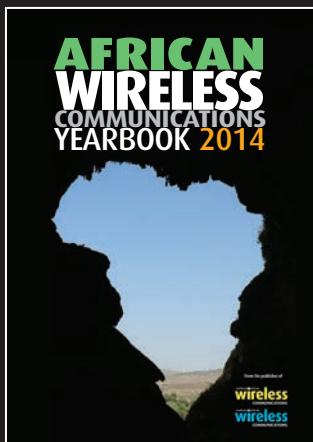
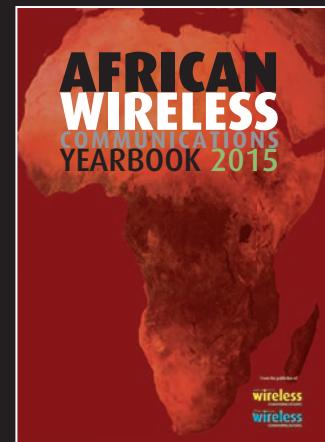
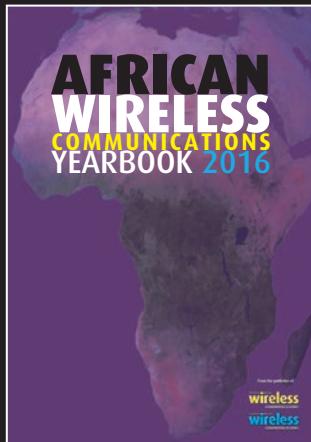
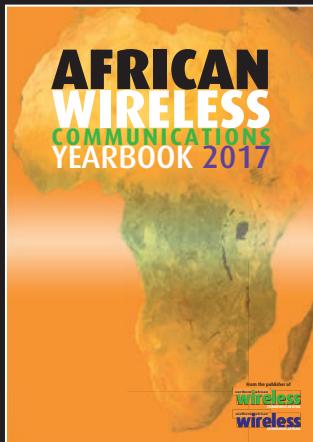
Dr. Paul Gardner-Stephen tests his mobile technology in Vanuatu following a volcanic eruption in the region.

system stands alone from everything else. If we can integrate that in a seamless way with the existing cellular networks, even if you're beyond the range of phone coverage, our devices can repeat a way back from the edge of coverage."

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