For communications professionals in north, west, east & central Africa

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Africa's Smartest Cities

Africa was the fastest urbanising continent in the world prior to the arrival of Covid-19. Are smart cities the solution to its rapidly urbanising population?

Africa is still the planet's most rural continent, with a mere 40% of the sub-Saharan region's population living in cities. Even the sprawling and bustling heartlands of Cairo and Kinshasa, teeming with traffic, pollution, inadequate public services, are in their relative infancy and on the brink of a growth spurt.

In short, Africa, like any other part of the world, needs to plan for the future if it is to keep up with its predicted and expected future.

One idea that appears to be gaining traction are newly-developed satellite "smart cities," manifesting themselves in ambitious multibillion dollar, hyper-liveable hi-tech cities populated with bustling, beautified boulevards, private condos and luxury cars.

Of course, money, culture, location and other factors mean smart cities around the world can be very different from one country to the next.

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Keith Matthews, country manager for South Africa and sales director sub-Saharan Africa Orange Business Services, says wherever it's located, a smart city must be intelligent, connected, agile, sustainable and innovative.

"There is no difference in the core aim of building a smart city in Africa to anywhere else in the world," he says. "The smart city uses IT and digital technology extensively to improve the quality of life of citizens, and to boost the economic attractiveness and tourism potential for local authorities and companies." Matthews adds that smart cities improve lives through everything from mobility solutions to sustainable energy and smart grids. *"However, they are dependent on the free, frictionless and efficient flows of data – this is what really makes cities 'smart' – supported by embedding and integrating key sophisticated technologies into the core of the city. Critically, smart cities should essentially be designed around human needs (human-centricity) and built on a foundation of trust," he says.*

Ben Roberts, group chief technology and innovation officer Liquid Intelligent Technologies, the pan-Africa technology firm formerly known as Liquid Telecom, says cities in the world fall into three categories. *"Very old and have evolved and expanded over centuries for example, Rome," he adds. " A new and planned city such as Milton Keynes in the United Kingdom, my own hometown, which was built from scratch and where everything has been planned and implemented to a blueprint. Cities/towns/even villages that have grown very fast such as Nairobi whose census results show the city has moved from a population of 2.2 million in 2000 to almost 5 million today. In Africa however, Nairobi is dwarfed by the mega cities of Kinshasa and Lagos with populations of almost 15 million."*

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Under its previous identity as Liquid Telecom, it spent the last decade building our fibre network which stretches 100,000 km from Cape Town to Cairo across 13 countries.

Roberts adds that the arrival of millions of urban-dwellers has created problems for unplanned cities around the world both in terms of infrastructure and capacity. That said, he opines that African cities have an advantage over many older overseas cities for a number of reasons. One is a lack of legacy infrastructure and systems means that African cities can start with the latest technology available – evidenced in telecoms where countries leapt to 3G, 4G and 5G rather than invest in fixed networks. The second, he says, is a young population combined with an entrepreneurial zeal.

"Our young people have the same aspirations as their foreign counterparts - to have fulfilling and well-paid employment, good housing, healthcare, education, access to the digital economy etc.," Roberts continues. "However, Africa's key ingredient is its 'Can Do' attitude and the ability of its people to innovate and create home-grown solutions to the continent's problems."

Third, Roberts says, problems that affect the entire population of a city. *"No matter how rich or poor you are in Nairobi, poor air quality affects us all which focuses the attention of government ministers," he adds. "However, this concept of the 'smart city', where technology and machine-to-machine (M2M) communications are leveraged to measurably improve the quality of life and efficiency of communities, can only succeed if connectivity is reliable and effective."*

The paragon for many observers is Eko Atlantic in Lagos, Nigeria, built on land reclaimed from the sea, which is expected to house 250,000 people once completed. Hope City in fellow west African nation Ghana is slated to feature the continent's tallest skyscraper.

Rwanda, a regional leader in developing "smart cities," published a Smart Cities Blueprint in May to help foster the use of technology in urban management. The continent needs to find ways of improving urban life.

In 2017, Finnish gear-maker Nokia and regional development firm SRG collaborated with the government of Rwanda to deploy smart city technology in Kigali to improve the lifestyle and social sustainability of citizens. At the time, Mohamed Abdelrehim, head of solutions and business development, for Nokia in Middle East and Africa market, said the project was in line with the company's vision to use technology innovation to create social sustainability and make people's lives better and safer.

The city has since developed into an enviable example of a smart city, according to Roberts. *"Kigali in Rwanda stands out as one of the cleanest and well-run capital cities in the region," he says. "And this is no coincidence, as it has institutionalised an agenda of urban planning and zoning with the aim to become a smart city at the heart of this."*

Liquid itself has been carrying out a lot of work in the Kenyan capital Nairobi, the headquarters for its east African operations, which it uses as a testbed for most of its pan-African services.

"Nairobi is a city with a number of challenges, with perhaps traffic queues being the most obvious to visitors and residents alike," ***Roberts explains.*** *"Large strides towards making Nairobi a smart city have been made in recent years with installation by the government of an extensive network of CCTV cameras and smart traffic lights in certain areas."*

Liquid began by building and operating a robust smart city infrastructure for Nairobi. This comprises of a city-wide fibre optic metro backbone, which connects all major buildings and office parks, and serves to connect many communications towers. Roberts says this further enables multiple MNOs to offer 100% 4G and emerging 5G coverage in the city, along with ISPs that provide affordable uncapped data using fibre to the home and Wi-Fi last mile technologies.

It's no secret that air pollution is a particular problem in Kenya with the World Health Organization declaring that it is the fifth largest cause of deaths and disability across the country.

Roberts says this pollution is caused by substantial increases in traffic levels, construction of high-rise buildings and new industrial activities releasing fine particulate matter into the air. *"Poor refuse removal services result in citizens burning plastic and other garbage on roadsides which is also a major contributor," he continues. "To help provide reliable data about air pollution, our IoT air quality system has been rolled out across 3000 sites in Kenya following a trial in Nairobi. The sensors provide detailed neighbourhood measurements of airborne pollutants every 2 minutes. This information is freely available to anyone via a simple dashboard."*

Head further north to Egypt and just outside Cairo, you'll find the New Administrative Capital (NAC), a large-scale project that has been under construction since 2015. It's one of the projects for economic development, which forms part of a larger initiative called Egypt Vision 2030. Orange has long been a major player in Africa and Matthews, says the NAC is "a truly visionary project and offers a glimpse into the high-tech future" of Egypt.

"Orange already has a huge amount of experience of operating in the region. We have developed several smart city projects across the Middle East, such as in Saudi Arabia and the UAE and Orange has a long history of operating in Egypt in particular," he says. "Because of this, our knowledge and understanding of the environment will allow us to fully adapt the design of the infrastructure to the needs of the new city. The NAC is set to become Egypt's new financial and administrative capital, housing the main government departments and ministries as well as foreign embassies. It will be built based on five main pillars: safety, connectivity, integration, digitalisation and replicability."

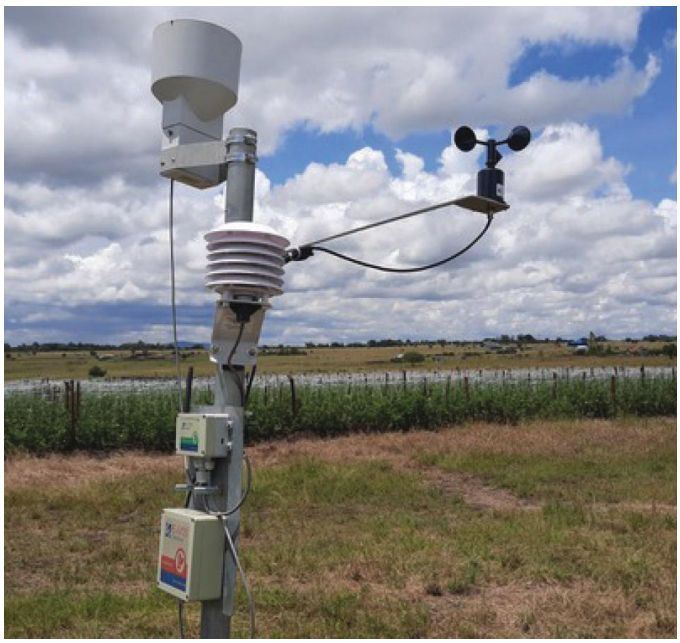
When it comes to comparing NAC with other African smart cities, Matthews says its distinctive feature is that it is a greenfield project and concept consisting of an entirely new city, designed and built from scratch, whereas most of the other African smart city projects consist of deploying smart solutions in existing cities or districts. *"The scale of the NAC presents its own challenges, and the solutions, priorities and operations deployed there will be different to other smart city projects across Africa," he adds.*

As far as Nairobi is concerned, Roberts says it lacks a smart city plan but has all the elements of a smart city organically coming together. He adds that the purpose and mission of such a master plan could be a road map to coordinate the smart city activities of central and county governments, private sector companies, along with NGOs and civil society.

"Completely new cities in Africa like Tatu City and Konza Technopolis, both in Kenya, are being constructed from the ground up as tech enabled smart cities from day one with an aim to be the pinnacle of modern living in Africa," continues.

Nevertheless, even with access to the right technology, infrastructure and with enough funding it's been said that smart cities can only make sense if put in the broader picture of giving every African citizen the right to basic services. Is that a fair comment?

Roberts says that using technology and data-driven systems to solve real-life problems is both pragmatic and cost-effective in the long-term.

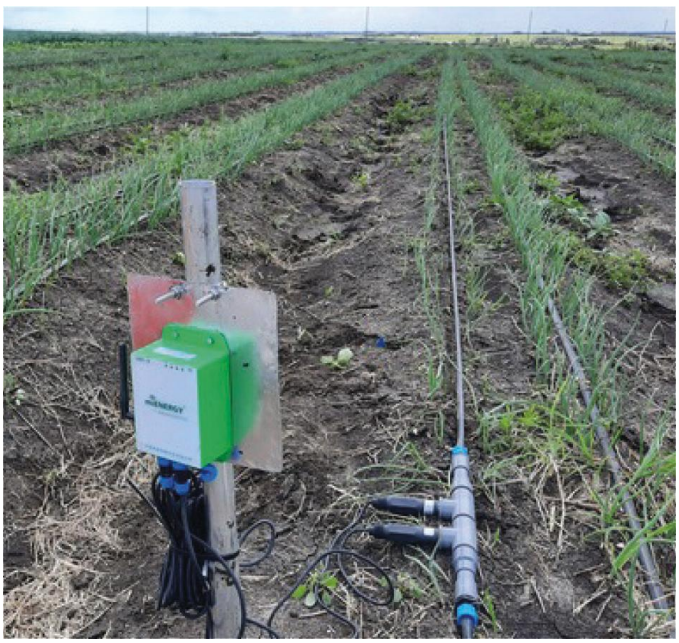


"Many African economies are driven by agriculture and Kenya is no exception," he says. "Outside of the large cities we are seeing smart technology being used in many ways to improve services. In the agricultural sector, Liquid is looking at ways that tech can enable precision farming in agriculture and in aquaculture."

Roberts cites examples of how Liquid, using the Sigfox 0G network, has enabled a successful precision farming deployment, now in its 3rd year of operation, in partnership with Twiga Foods at its Takuwa Farm, just outside Nairobi.

The results have been an increase in yield of crops such as onions, as well as decrease in input costs, and the project recently won an IoT technology award at the East AfricaCom conference.

*"In the extreme western side of Kenya, Liquid has deployed sensors in Lake Victoria to help grow the yields of Tilapia fish farmers," **says Roberts**. "It is certainly my dream that the enablement of Agri-Tech will not only make a noticeable impact on the GDP of African countries but will also offer a bright future to the tech savvy youth who are born in rural areas to remain in their communities implementing technology for rural income generation, instead of heading to the cities in search of jobs."*



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For Matthews, smart city projects can help facilitate the delivery of services to citizens and help improve the quality of life for growing urban populations, giving more people easier access to local services and information. *"A smart city is a complex ecosystem with an array of vertical activities, including digital solutions to improve access to health, facilitate mobility, enhance security… all coordinated by the smart city integrated operations and security centre, providing safe city and digital living services and experiences," he says. "Every smart city is a unique network of integrated services that may grow and develop organically over time as new use cases emerge and then evolve, supported by new bursts of innovation. The key to success is embedding intelligence, integrating sophisticated technologies, including IoT and artificial intelligence to make use out of the massive amount of data generated across the smart city."*

In fact, Matthews goes on to say that as a result of a growing number of people living in cities, smarter cities can help improve the quality of life for citizens and create new opportunities to innovate. He says that Africa has the advantage of relatively little legacy infrastructure and so can move forward faster. *"By making a city smart, the urban digital ecosystem can bring new opportunities for the creation of new jobs and small businesses, and also for existing companies to develop their business – creating added value for urban populations," **Matthews adds.** "Smart city solutions can also help ease traffic congestion, improve the information on city services available to residents, and help make areas safer through smart lighting and surveillance, and enhance the efficiency of utilities and energy consumption. Making a city smart and listening to people's needs and ideas can empower the population and help city administrators make the right decisions."*

While Africa has its problems, just like every other continent, it is at least addressing them by embracing new technology and adopting wireless connectivity where and when it can. This can only lead to a very bright and smart future.