Telecom26

Helping disaster relief and supporting innovative services

NGO IOT USE CASES

IoT is bringing better services and connectivity to the NGO and not-for-profit sector

SOLUTIONS FOR SUSTAINABLE DEVELOPMENT AND HUMANITARIAN RELIEF

The emerging world of IoT has created significant opportunities in numerous sectors – and is set to give a boost to global development projects. IoT technologies and capabilities will enable a huge range of applications to help NGOs and not-for-profit agencies in delivering new services. Despite the diversity in use cases, there's one common factor that's crucial for the successful delivery of new services, to the widest audience and with the greatest global reach: wireless cellular connectivity.

That's because almost all these applications depend on collecting and receiving data. In turn, this requires communication between a remote device or terminal and a server in a cloud, accessible via the internet or a secure private connection. Since many applications are targeted towards the needs of remote or isolated communities, the only infrastructure available for establishing the necessary data connections is, typically, wireless cellular networks.

So, with wireless cellular connectivity, new applications for delivering education, improved agricultural services, healthcare and much more can be brought to even the most remote communities.

This ensures the successful delivery of key development projects to support the goals of global agencies such as the United Nations, as well a host of independent NGOs that are striving to boost development and to create a sustainable future.

In this briefing paper, we explore emerging IoT use cases for NGOs, see how they support development goals – and investigate the connectivity they need.

What does wireless connectivity mean?

UNDERSTANDING COMMUNICATIONS' NEEDS

Before we turn to specific use cases, we must be clear about what we mean by connectivity. Wireless cellular connectivity is based on mobile networks, that use licensed spectrum, allocated by national governments. Spectrum is identified and assigned to different forms of cellular network technology – for example, 2G, 3G, 4G, 5G – by the ITU – with the result that there is a standardised approach that has created dynamic global market and provided the economies of scale to make solutions affordable.

Cellular networks are built by deploying appropriate radio masts and connecting them to control software. As a result, any device equipped with a SIM can connect to any available network, subject to the policies of the network provider.

Since wireless networks are available in every country, they – and they alone – provide the reach to support data access to applications. However, the sheer diversity of applications and IoT projects means that many different stakeholders are involved. Consequently, there are different perspectives to consider when we think about connectivity, with different performance needs and expectations. In the main, we can divide these into two camps: user and provider.

Meeting the needs of users and providers
CONNECT GLOBALLY, DEPLOY LOCALLY

IoT application users – who may be farmers, local schools, clinics, community hubs and NGOs active in the field, among others - are mostly concerned with connectivity to static devices. These are typically deployed in the field – and then stay there, with no mobility requirements. In such cases, a local service provider (generally, a mobile network operator) is often chosen by default, but that may not help if there are numerous locations to be served, or if network coverage is inconsistent.

On the other hand, IoT application providers may not know much about the environment in which their service are accessed; they may be shipping devices all round the world – but have limited knowledge of the local situation. As such, they simply care about ensuring that the requisite connectivity is available.

In both cases, more often than not, they need to connect to whatever network is available – and this means they need to work with a partner that can access any network, anywhere – not one partner for each location. A local provider may not offer this flexibility, as they typically restrict the networks to which their SIMs can connect. If the network is disrupted, service will be lost.

With Telecom26, this problem is eliminated, because our SIMs – embedded or otherwise – can connect to almost every global network, so the users and application providers don't need to worry about this aspect.

Users and application providers are therefore able to connect to any of the available mobile networks, rather than being tied to a single operator, benefitting from consistent connectivity.

Put simply, the key to the success of any IoT service or project is flexible, cost-effective connectivity that can leverage any local network provider and cross-borders, to ensure that remote applications, services and monitors can perform correctly.

Agriculture

SUPPORTING INNOVATIONS IN CROP MANAGEMENT AND YIELD ENHANCEMENT

Enhancing crop yield and protecting against pests while growing revenue are key concerns for farmers.

Advances in technology mean that remote monitoring can help farmers manage the use of fertilisers, irrigation and more – boosting productivity and increasing the supply of food, while reducing costs to secure better income and profit.

A growing range of sophisticated (and inexpensive) monitors, backed by cloud services are now available to help boost agricultural development by providing early alerts of environmental and biological threats.

The information captured can be aggregated to drive efficiency and boost optimisation. Remote wireless connectivity to any local network is key to their success, enabling data transfer securely, efficiently – and in a timely manner.

Education

TAKING THE CLASSROOM TO THE FIELD AND BUILDING LIFE OPPORTUNITIES

Extending education to all – adults and children alike – is essential for opening opportunities, increasing literacy, and personal empowerment. It delivers individual benefits as well as boosting economies. But, with many people beyond the reach of the classroom, ensuring universal access to even primary schooling can be hard, let alone tertiary or adult continuing education.

Fortunately, remote connectivity can ensure the delivery of educational programmes and lifelong training opportunities to the most remote location. This can be achieved with micro-networks – routers with SIMs to connect to public networks combined with Wi-Fi or Ethernet access to local devices, or simply by providing SIMs for appropriate devices. Initiatives that capitalise on cellular data provide opportunities for reaching more students, more effectively.

Environmental monitoring

COLLECTING ENVIRONMENTAL MONITORING DATA

Environmental data is crucial for a variety of purposes. From early indicators of a catastrophic event to long-term monitoring to measure KPIs, the wealth of data it's now possible to collect is helping NGOs and agencies develop plans and response to reduce or mitigate the impact of issues, as well as to create evidence-based programmes to support sustainability objectives. Temperature, humidity, ground tremors, wave activity, soil quality are all key indicators that need to be considered.

Remote sensors and monitors are essential for collecting the information agencies need to analyse data and to inform the decisions they make. Cellular wireless connectivity provides a cost-effective, efficient means to convey such data to facilities for processing – and provide critical resources to support effect environmental monitoring – but flexible connectivity is a must to ensure reliable reporting.

Community care

UNLOCKING E-HEALTH FOR ALL

eHealth is seen as a way to bring healthcare providers and practitioners closer to remote and underserved communities, as well as a means of augmenting existing resources with specialist help from other locations. In addition to person-to-person care, NGOs are also running programmes to boost remote testing and data collection capabilities, as well as immunisation programmes.

Central to these efforts is the use of technology – for increasingly sophisticated devices, terminals for patient consultation, sensors, test equipment, data processing and display, and more: all of which depend on the availability of cellular connectivity for data access. This can be via embedded SIMs, SIM-enabled routers and more – but security, data protection and other factors are of particular concern for practitioners, agencies and patients. The network connections must be secure and robust to meet these demands.

Tourism

HELPING COMMUNITIES BUILD SUSTAINABLE REVENUE

Many developing nations are rich in natural assets and are seeking to try to encourage tourism. Some of these efforts are linked to programmes for conservation, boosting natural capital, while others are linked to the provision of better facilities. Eco-tourism, safaris and more offer significant economic benefits – but connectivity to support programmes is essential.

With many animals of interest crossing national boundaries, conservation efforts can be enhanced with tracking solutions. These must be capable of connecting to any network, because natural migration corridors cannot be disrupted or constrained. So, IoT devices, as well as local cellular wireless connectivity solutions for lodges and camps are integral to driving economic development.

Energy generation

POWERING UP THE NATION

Bringing new sources of power to remote areas has several challenges, not least in terms of logistics. Often, these are situated in areas with patchy, inconsistent cellular coverage – but connectivity is essential for devices that monitor performance and protect remote assets.

In order to secure the best connectivity for these solutions, IoT devices need to be able to connect to multiple networks, with high levels of security, so that they can switch provider when better service is available from a different network. In border regions, that can often be from a provider in the neighbouring country, so the ability to roam cost-effectively and seamlessly is essential.

Disaster relief

BRINGING COMMUNICATIONS TO THOSE IMPACTED BY CATASTROPHE

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Water

SAFE DRINKS, IRRIGATION AND SEWERAGE

Access to clean water supplies is not always easy to deliver. For many people, water is scarce, hard to reach, or may be subject to dangerous pollutants, rendering it unsafe to drink. Water needs to be potable and free from pathogens and parasites.

There are many solutions to this problem, from the introduction of power-driven pumps that can extract water from safe reservoirs and cleanse contaminated supplies, to those that monitor water quality, availability and more. Connecting sensors that collect vital data regarding the health of this equipment or metrics from water requires robust, reliable data connectivity. Even if the volume of data generated is low, it must be delivered to protect human lives.

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SUPPORTING NGOS AND SUSTAINABLE DEVELOPMENT

Many projects that aim to boost economic growth and sustainable development are located in remote areas – which are beyond the reach of fixed infrastructure. Devices used to support applications in this context need data connectivity. Cellular wireless connectivity, however, is often available – but may be patchy and inconsistent.

Telecom26 provides connectivity solutions that enable remote equipment to connect to any available cellular network – reducing the dependency on a single national network and providing flexibility for what can be unpredictable situations. Our solutions range from SIMs to routers, backed by a range of capabilities to enhance security and to protect data.

They are used by NGOs in the field – for long-term deployments as well as temporary, emergency relief projects. By enabling access to any operator, they help agencies deploy, wherever they need.

Enabling adult education in Kenya's Kakuma refugee camp

CASE STUDY

The Kakuma refugee camp provides shelter for nearly 200,000 people in Kenya. Run by the UNHCR, many of the young adults living in the camp have had their education interrupted which, of course, impacts upon their economic future and life chances.

The UN High Commission For Refugees says that globally only 3% of young adult refugees are in Higher Education, however, this figure drops to 1% in African refugee camps. Globally 77% of displaced children of primary school are in education and 31% for secondary school age.

Similarly, in its 2020 report Trends in Adult Learning and Education in Africa, the UNESCO Institute for Lifelong Learning (UIL) stresses the need for African countries, and the international community, to do more to enhance participation in adult learning and education as it believes this is pivotal in achieving the Sustainable Development Goals.

Schools within the Kakuma refugee camp are already oversubscribed with children aged 16 and below. To help young adults continue with their education, a new device called a Beekee Hub has been installed.

The Beekee Hub has been developed by the Geneva-based start-up Beekee, an EdTech spin-off from the University of Geneva (Switzerland), specifically for use in emergency settings where student numbers far exceed the number of available schools and teachers.

It has been deployed in trials in the Kakuma camp, in a project led by Beekee and InZone - the latter providing higher education in communities affected by conflict and crisis in the Horn of Africa and Middle East.

The Beekee Hub is a semi-nomadic device which creates a wireless network so that students can access content inside the Hub from the browser of their own smart feature phones, smartphones, laptops and tablets. The Hub acts as a last-mile relay and connects to the Internet on-demand to download new material and to synchronize learning and enable access to collaboration tools such as Beekee Live. The Beekee Hub differentiator is that content is always accessible within the device; and it is easy for children, teachers and adults to access.

Unreliable bandwidth and patchy connectivity are problems encountered by digital education and other programmes operational across Africa, Asia and South America. Indeed, many well-meaning digital education programs have failed because of connectivity issues. Moreover, many remote solutions depend on connectivity via the network of a single operator – so when that network is disrupted, then a change of SIMs was required to restore connectivity via a different partner.

Telecom26's Multi-IMSI global SIM cards were developed with the specific goal of improving connectivity in remote areas. They enable devices to automatically access and switch between multiple networks both in-country and across borders thus removing the need to worry about the coverage of a single MNO, or the existence of roaming alliances. This solves the problem – completely – ensuring that consistent connectivity is available for the support of educational programmes.

- Flexible connectivity, in any country

- Seamless coverage across 1100 cellular networks from over 620 mobile operators in more than 220 countries - and ability to customise connectivity according to the budgets

- Full control and management of SIMs through a customised service portal

- eSIM options for future integration possibilities

- Remote diagnostics, intelligent access and asset management

- Automatic connection to different networks to ensure consistent access to remote services

Telecom26 donated Global SIM cards for use by the Beekee Hub during the Kakuma refugee camp trial. When new educational material is ready, the Beuke team transmit it, so that it can be stored locally – reducing further the need for continuous connectivity and improving service delivery to students.

Telecom26 provides connectivity to digital health and education programmes in some of the most remote places in the world. Our Global SIMs are compatible with 1100 cellular networks from over 620 mobile operators in more than 220 countries. It has also developed a multi-SIM router which enables connectivity to the best performing network available - cellular, Wi-Fi or satellite.

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