Photo courtesy Speedcast ●●●

Revolutionizing remote sites around the world with IoT ● ●

The Internet of Things (IoT) is changing the way that modern businesses operate. At the end of 2021, there were an estimated 31 billion devices being used worldwide. IoT is enabling a new wave of innovation, from automated vehicles to factories where temperature and cooling systems can be adjusted without any human intervention.

John Geasa, Senior Director, IoT Products and Services at Speedcast

Businesses that have begun to implement IoT connectivity solutions are already seeing the benefits, with a recent McKinsey report indicating a 27 percent increase in human productivity and 23 percent in operation optimization. IoT technology has allowed companies and organizations to sidestep the workforce challenges that stem from working on remote sites, as well as the further issues resulting from the COVID19 pandemic.

The role of satellites in maximizing the efficiency of IoT cannot be understated. Without the connectivity solutions provided through the use of satellite technology, remote sites with limited access to mobile networks would be unable to enjoy the benefits of IoT. The companies that leverage the correct software and reliable satellite connectivity can gain access to unlimited remote site monitoring and innovative tracking solutions.

DEVICE AGNOSTIC
The global pandemic increased the challenges that many operators working in remote industrial environments were already facing. Regulations and lockdowns minimized the number of resources available onsite. Those numbers are slowly returning, but not yet to pre-pandemic levels. Nevertheless, companies have to rely on IoT to ensure their operations are running efficiently at the farthest reaches of the world.

In order to succeed, companies need to be device agnostic. Without being confined by brands or operators, companies can choose the best-of-breed technology that meets their requirements. The combination of sensors, tracking solutions, communication, and remote control that can utilize different connectivity paths will accelerate the organization's digital transformation.

CONNECTING THE EDGE
Since the advent of 5G, users have been accustomed to greater capacity, with some operators offering speeds up to 10 Gbps. 5G connectivity has been designed to support IoT with improved performance for narrowband applications like machine-to-machine. It offers better access technology, which reduces the power drain on small, battery-operated IoT devices and allows them to operate much longer.

Linked in 🐦 ▶ YouTube f

John Geasa, Senior Director, IoT Products and Services at Speedcast ●●●

However, when an asset is off-the-grid with no cellular coverage, 5G is no longer an option. Organizations will need to rely on other technologies. Satellites are essential in order to fill this void, and in recent years satellite technology advancements have played a key role in maintaining productive and stable operations. Medium and Low Earth Orbit (MEO and LEO) constellations have changed the landscape, enabling many devices to stay connected despite the operational sites being in hard-to-reach areas or at sea. LEO satellites occupy the lowest latitude, operating between 800 and 1,600 kilometers above the surface. By operating at such low proximity, LEO satellites offer a delay of just 0.05 seconds, making them ideal for use-cases where real-time connectivity is essential, such as video conferencing and remote operation applications.

To ensure critical applications are connected, organizations can look to implement software that manages transitions between 5G and LEO satellites, enabling always-on connectivity no matter the location. Software-defined Wide Area Network (SD-WAN) technologies allow users to tailor the networks to their respective industries. Once 4G and 5G networks become available the most cost-effective option will be automatically chosen, with the software switching back to the always-on satellite connection should there be any network disruption.

With increased efficiency and performance, businesses that can utilize IoT technology with the most effective communication technologies can expect greater profitability.

ADVANCED CAPABILITIES SAVING LIVES

Some of the greatest demand for IoT technology comes from security applications - for workers and equipment alike. Greater performance levels will come from a workforce who knows they are protected and safe whilst on site. Connected vehicle and asset tracking systems are being incorporated throughout remote sites to increase safety and security for personnel as they move around and allow for them to quickly call for help in an emergency or warn of a threat. The use of satellites plays a key role in protecting the workforce and their equipment: LEO satellites enable a tracking system that alerts operators should any assets deviate from their assigned routes, whilst geofencing technology can trigger an alarm should equipment be taken from its authorized zone.

Traditional security measures are also being enhanced using telecommunication systems integration elements, such as intrusion detection, Closed-circuit television (CCTV), and access control, to protect workers and restricted areas onsite. Wi-Fi availability and Internet Protocol television (IPTV) allow operators to communicate with other employees or sites seamlessly, ensuring reliable lines of communication for operations no matter how remote the location.

The safety of staff on site is also improved using wireless technology. Autonomous vehicles navigate using signals from beacons that can provide accuracy as close as a centimeter. Devices can automatically detect these, and vehicles can be quickly stopped should someone come too close. For mineworkers, hazard sensors for oxygen and carbon dioxide levels are automatically monitored throughout an underground area with these innovative IoT devices, drastically reducing the risk of injury or hospitalization.

In addition to improved safety at sea or on remote sites, engineers and operators can use network-optimized video streaming solutions to collaborate and continue doing their jobs, without needing to travel to the field. Tasks that may have taken days to resolve will be executed within minutes, drastically reducing downtime. This also reduces costs for operators, lessening the need for transportation and living expenses. Robotic and Artificial Intelligence technology now allows companies to train the local workforce to do the work and provide them with "hands-on" live support without additional resources onsite, which was especially helpful when stringent travel restrictions and safety regulations were being enforced. Remote applications will even allow personnel to manage complex industrial machinery from alternative locations as next-generation technology comes to the fore.

A PROACTIVE APPROACH TO FUTURE-PROOFING

Technology continues to change and adapt at an ever-increasing rate. IoT technologies that are considered state-of-the-art today can quickly become outdated, and businesses may find themselves implementing newer, expensive solutions to make sure they're able to maximize production in remote sites. This newer technology may also become obsolete should future developments in technology not be predicted and incorporated into operations.

Companies can combat such obsolescence by future-proofing the devices they use in their operations, providing their workforce with reliable, up-to-date technologies that will ensure long-lasting performance alongside strong Return on Investment (ROI). Connected IoT devices allow for easier updates, and businesses who choose open infrastructure for their systems make it easier to upgrade their technology without having to rely on a single vendor. For technology in use at remote sites, the strong connectivity offered by satellites is enabling quicker

updates, helping businesses maintain at the forefront of IoT technological advancements.

Taking a proactive approach to IoT technology is vital for success, and plans must be in place for the continual replacement of business infrastructure with newer, optimal technology before the current systems become outdated. By incorporating planned obsolescence into operations, the lifecycles of systems are greatly extended, and a high level of performance is consistently maintained. Futureproofing remains vital to avoid unplanned, expensive systematic changes, especially in remote areas where even traveling to such sites to replace anything can be costly and time-consuming.

OFFERING A DIGITIZED FUTURE

Businesses are only beginning to tap the potential of IoT to drive economic growth. Investment in digital technologies will only lead to further enhancements for the on and offshore sites that exist even in the most remote areas.

With the number of Industrial IoT connections across the globe predicted to reach more than US$36 billion by 2025, operators who invest in the right solutions for their operations can look forward to a profitable future as IoT connectivity looks to continue revolutionizing all industries. To maximize the capabilities of such technology, satellites will remain vital to operations long into the future. ●
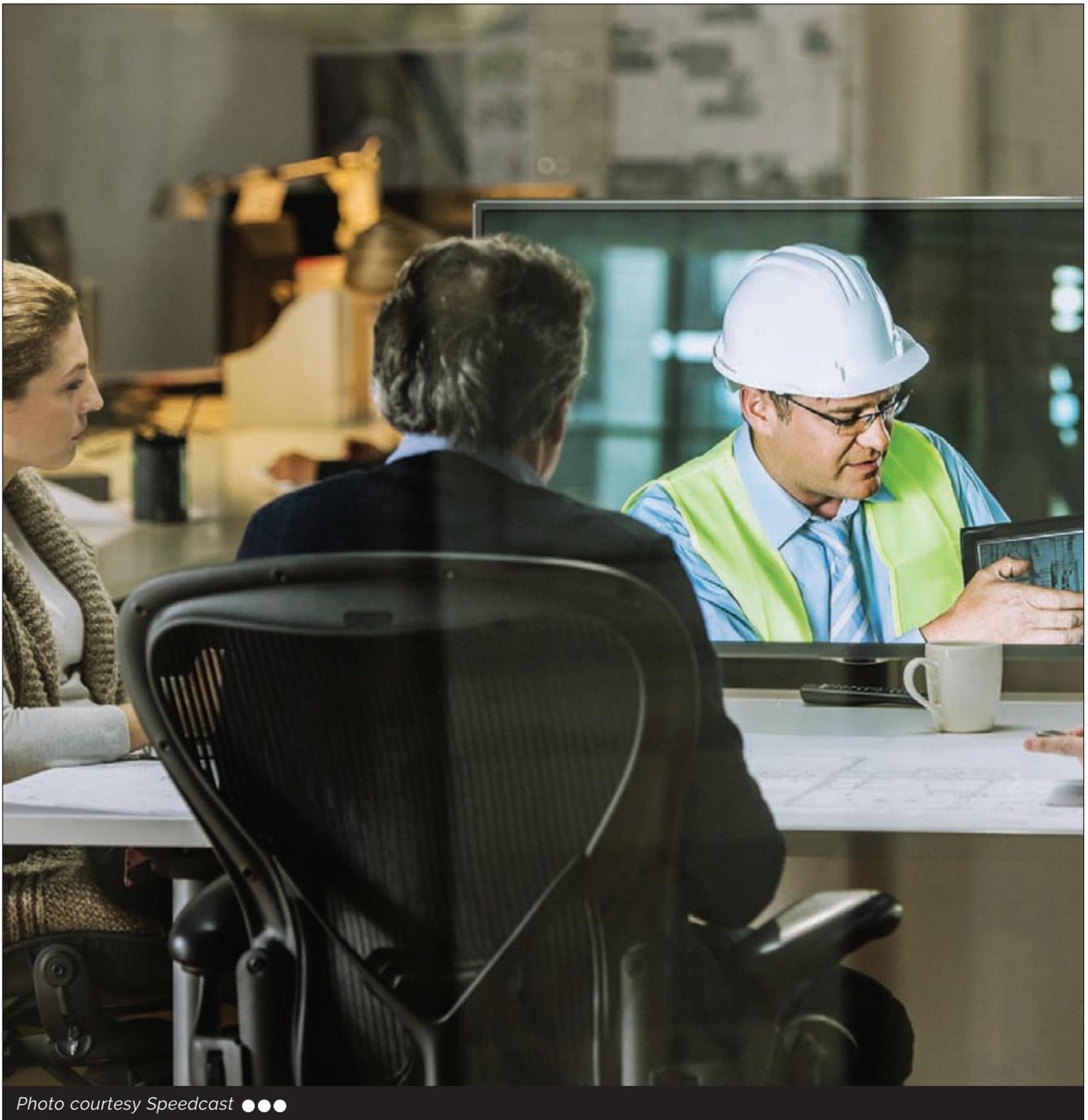

Photo courtesy Speedcast ●●●

STN

A FULL RANGE OF HOSTING SERVICES FOR

LEO / MEO CONSTELLATIONS

TT&C   SERVERS   ANTENNAS