

Smart City Investment Laying The Foundation For IoT

The Internet of Things (IoT) is an emerging concept based on the vision of a fully connected world, the ultimate goal of which is seamless connectivity between things, people, processes and data anywhere, anytime and in any condition.

In addition to providing a strong architecture, IoT platforms provide access to and integration with many value additions. These are typically additional layers of security, micro-services, data analytics, and emerging technologies. The strength of this ecosystem depends on how well the IoT platforms are able to integrate and create meaningful offerings for their customers. Devising a strategy to create a robust ecosystem that can cater to diverse customer requirements is one of the biggest conundrums for an IoT platform vendor.

Middle East Experience

Underpinning the development of IoT is extensive investment in telecoms infrastructure, particularly the more high-capacity networks such as fibre, 4G and the emergence of 5G. The Middle East has shown an appetite for such advances, with leading equipment providers such as Huawei and Nokia already running NB-IoT trials with some of the leading operators in the region. This is done with the view to being at the forefront of industrial IoT for countries such as the U.A.E. and Saudi Arabia.

In the Middle East, IoT investment has been led by smart city initiatives as the major cities look to make their infrastructure and systems more intelligent. This has been driven by the emergence of smart technologies as well as the growing pressure on the cities' infrastructure due to their large and rising populations. The U.A.E. and Saudi Arabia are looking to lead the way with their smart city initiatives, with both countries harbouring ambitions to have the first truly smart cities in the region.

In 2017, Saudi Arabia commissioned its first smart city in Yanbu through a partnership between the Royal Commission of Yanbu, Bayanat Co and Etisalat Mobility. The project was developed to promote sustainable urban development, featuring among others, emergency response, intelligent traffic management and intelligent energy management. The SANS smart pole system is also one of the key applications of the smart city initiative, which is based on street lights poles that include WiFi hotspots, video monitoring, sensors, information release, solar power systems and public address systems. The country's planned Neom smart city is expected to be one of the largest and most ambitious initiatives in the world, with an estimated \$500 billion earmarked for the project. Expected to be completed by 2025, advanced technology will drive smart energy and water, transportation, biotechnology, media and entertainment and advanced manufacturing.

Dubai is also a top destination for IoT solutions, with the view to become a smart city. The focus of the city's transformation has been on its energy and public transportation infrastructure. To intelligently manage traffic and relieve congestion on the roads, as part of the smart city initiative, a range of smart devices including cameras and sensors are placed

on the major roads and different parts of the city, which are then controlled centrally.

Other use cases for IoT that are already under way or planned include the following:

Autonomous Vehicles: The U.A.E. has already taken the lead in autonomous vehicles, where vehicles will be connected with each other, as well as with the road ecosystem (such as pedestrians, roadside infrastructure and network servers) through sensors, robotic drones and cameras. Such a use case will require very high-speed network connectivity, security infrastructure, integration of payment mechanisms (for toll, parking, fines, etc) and various other components.

Oil & Gas Automation Process: Connected IoT sensors are used to monitor asset performance and help boost rig efficiency by collecting data on water and oil quality, gas, humidity, leakage, flow and temperature, amongst others. There are four rigs in the North Atlantic Basin that have already adopted this solution. In the GCC, Saudi Arabia and the U.A.E. are exploring remote monitoring of oil wells through IoT platforms. High speed connectivity will be one of the critical enablers in such scenarios, and can significantly boost the outcome of such an implementation.

The Way Forward

As part of their long-term smart cities ecosystems, Middle East countries could consider other advanced IoT systems in healthcare, utilities and public safety.

The development of Automated Warehouse Management systems is transforming the logistics and retail sectors. The U.A.E. is the logistics hub of the region, and has large numbers of sophisticated warehouses. This could be one of the immediate use cases for drones, enabled by 5G networks. Logistics and retail organisations can leverage drones embedded with a camera to scan the barcodes and RFID tags of inventory and automatically update the backend supply chain and ERP applications. It can also be used to ensure warehouse safety, speed up the delivery process and save on labour costs.

With the emergence of 5G technology, vehicle clustering can also be an important IoT application in the automotive sector. This refers to the clustering of a group of vehicles that are congested in the same traffic flow in order to ease traffic congestion. This however requires the city to invest in intelligent transportation systems and sensors in order to aggregate, analysis and automate the traffic flow.

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