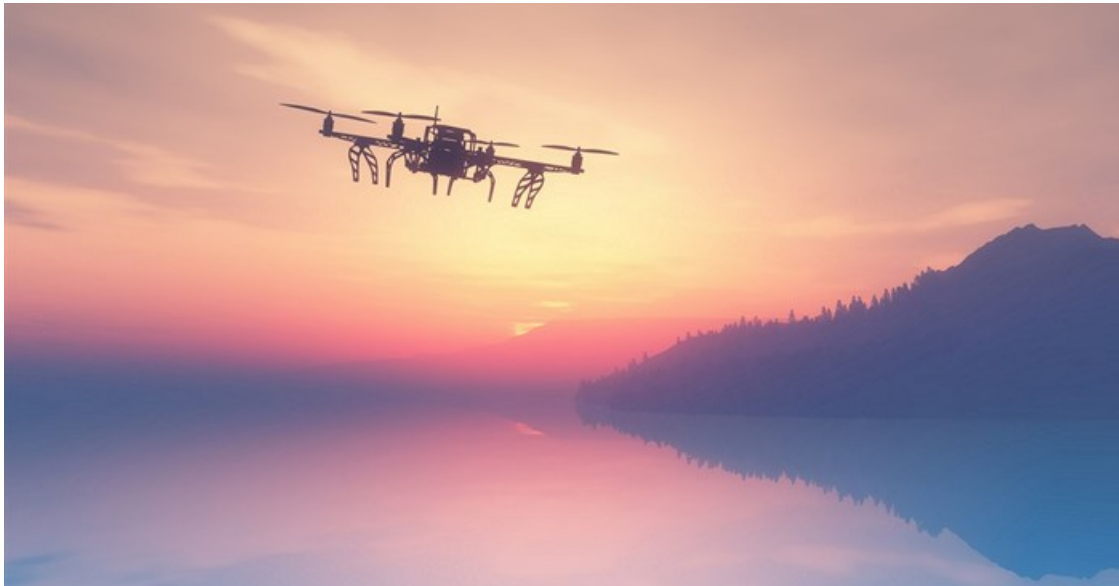


Eyes on buildings: Drones offer inspection, maintenance benefits

By [Jane Thomson](#)

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In facilities management, inspecting large institutional, engineering, manufacturing, mining and commercial facilities and assets can be a challenging, dangerous, and dirty job. Ensuring that assets are performing reliably to design standards means balancing tight budgets and aging infrastructure or finding new ways to maximise the value of existing assets. As digital technologies merge with unmanned aircraft systems (UAS), otherwise known as drones, maintenance and engineering managers maintain assets and facilities while also reducing costs and safety risks.



The commercial applications market for UAS and vehicles is projected to grow from \$2bn in 2016 to more than \$127bn by 2020. Infrastructure has been identified as one of the business areas that can best benefit from the use of drones. In fact, the value of prospective drone applications in global infrastructure projects is expected to reach \$45bn in the next few years.

Laws and standards

In South Africa, the use of drones has escalated to the point where the Ministry of Transportation and Civil Aviation Authority (CAA) recently added a chapter on remotely piloted aircraft systems (RPAS) to the Civil Aviation Regulations, including technical standards and aeronautical information circulars. Under these laws and standards, South Africa permits different forms of RPAS operations: private, commercial, corporate and non-profit operations.

The potential benefits of drones have received a great deal of attention, as more and more uses have been identified. Drones give managers easier access to data, lower cost and risk, and the ability to document asset conditions in an automated fashion. As the technology to support drones progresses, facilities, infrastructure, and asset managers will be better able to use drones to perform fundamental maintenance and security activities.

Accessing hard-to-reach spaces

By putting drones to work, managers are given visual, thermal, light detection and ranging (LiDAR), heavy-duty engine oil (HD-EO), corona, hyperspectral, gamma, and magnetometer inspections of hard-to-access spaces. Using remote-controlled cameras, drones can relay images of buildings, rooftop machinery, or a vital piece of equipment in an

inaccessible location. With the use of this advanced technology, field technicians monitoring equipment performance can obtain valuable visuals and details about critical assets — all without risking their well-being. The ability to compare prior inspections with current results to rapidly identify changes also can give managers more actionable information with which decisions can be made.

To keep facilities and infrastructure operating effectively and extend their performance lives, it is crucial to monitor performance and conduct preventive maintenance. This is particularly true of mission-critical equipment that cannot fail, such as generators, security systems, wind turbines, and electrical towers.

Safe and cost-effective inspections

Drones can perform functions such as perch-and-stare, video capture, and laser scanning, which make them effective methods for handling many of the dull, dirty, and dangerous functions of inspection and surveillance. They also offer flexible flying capabilities, as well as the ability to capture high-quality images and footage. With both tethered and untethered types of drones, technicians can safely and cost-effectively inspect and maintain large assets and infrastructure, as well as parts, tools, equipment, stations, and underlying information technology assets.

The use of drones only solves one part of the challenge managers face. The data and images drones gather need to be shared with a sophisticated enterprise asset management (EAM) solution that incorporates historical records, maintenance standards and specifications, repair instructions, diagrams, warranty information, and other data to assess condition levels and determine maintenance needs.

By sharing the information collected by drones with an EAM system, managers can improve their asset maintenance programmes, more efficiently schedule maintenance and track assets, inspect locations where it is difficult and time-intensive to send workers, and create a safer working environment.

Minimal disruption to operations

Beyond photographic images, drone technology also can supply infrared and X-ray images to detect structural issues or dangerous leaks in an environment that might be unsafe for humans. The drones also can capture input sensor data, such as colour video, thermo-video, still frames, and LiDAR three-dimensional data and send it directly to an EAM system.

Capturing information in real-time allows managers and technicians to compare the condition of assets today with previous imagery and sensor readings, and then compare them to manufacturing or industry standards to determine the next course of action in the asset management lifecycle. Managers can then schedule maintenance and repair activities directly from the EAM system, causing minimal disruption to operations.

A variety of facilities are using drones to maximise the lifespan of their assets. Think of the possibilities for building and structure management. When managers implement a comprehensive asset management strategy that includes the use of drones for inspections, they can gain greater operational visibility to inform their decision-making, better manage facilities'

energy consumption, and become more proactive in operations and maintenance.

ABOUT THE AUTHOR

Jane Thomson, MD, Softworx, Infor's Master Partner in Africa.

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