

# TECH

## How AI and digitalisation are changing the real estate sector

Covid-19, resulting manpower shortage push firms to digitalise their ops more aggressively

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How many workers does it take to inspect a building for defects?

With the increasing use of emerging technologies like drones, artificial intelligence (AI) and Internet-of-Things (IoT) devices, the answer could soon be close to zero.

The traditionally labour-intensive real estate and built environment sector has been hit particularly hard by the pandemic and the resulting manpower shortage.

But this has also pushed firms to digitalise their operations more aggressively, with major players in both the private and public sectors increasingly adopting tech solutions for building construction and maintenance.

Ms Jane Ong, who leads the digitalisation committee at real estate developer GuocoLand, said the Covid-19 pandemic's disruption of the built environment sector has heightened the need to digitalise and innovate processes in creating products and services.

She added: "We recognise that, as a developer and building owner, we are the main procurer of products and services and hold a pivotal position in directing the development of the built environment sector."

GuocoLand recently announced a series of strategic partnerships with local tech firms to accelerate its digitalisation efforts.

In a statement, the group said it plans to launch more than 20 digital projects over the next two years, with the help of Enterprise Singapore, in collaboration with various local start-ups and small and medium-sized enterprises. These efforts are aimed at strengthening GuocoLand's property investment and development businesses, it said.

### DRONES FOR BUILDING INSPECTION

GuocoLand plans to partner Singapore-based Operva AI to deploy drones with infrared thermography capabilities to conduct building inspections on its residential developments.

The drones will be equipped with scanners that can take thermal images of a building, which are visual representations of variations in temperature. This will replace traditional manual tests for

detecting air and water leakages as well as defects in the exterior facades of buildings, and can be used for quality assurance in new buildings and preemptive maintenance of older buildings.

AI will also be used for automated problem identification and can enable repetitive audits that are done periodically using a set of common criteria. GuocoLand said this is expected to streamline the inspection process and improve efficiency by up to four times.

Government agencies like the Housing Board and JTC, which oversees industrial land and infrastructure, have also used drone-captured images and AI for building inspection and predictive maintenance. JTC reported last year that this helped cut inspection time for its 31-storey, 128m-tall JTC Summit in Jurong from around four weeks to four days during a pilot run in collaboration with H3 Zoom.AI.

### REMOTE MANAGEMENT OF SITES AND FACILITIES

GuocoLand's partnerships with Airsquare and SpaceAge Labs will allow its construction site and facilities managers to remotely check on other aspects such as construction progress and utilities usage.

Airsquire will use AI to create 3D virtual replicas of construction sites using images captured by workers with 360-degree cameras. Project managers can then conduct virtual inspections remotely and compare the construction progress against building information models, which are digital representations of the building's design and features.

This also helps reduce congestion at work sites by lowering the frequency of physical site visits, GuocoLand said.

IoT sensors made by SpaceAge Labs will be used to monitor lights installed in hard-to-reach places, such as atop the "crown" or spire of a tall building, as well as water meters. Using AI and machine learning, the system can then recognise normal consumption patterns and alert building managers to anomalies like abnormal electrical loads or water leaks. Managers can also manually monitor the usage data, which is updated hourly.

A similar system will soon be rolled out to other properties na-

## Digitalisation in the real estate business

Real estate company GuocoLand is partnering local tech firms to accelerate its digitalisation efforts, and it aims to roll out more than 20 projects to strengthen its property investment and development businesses over the next two years. Here are some of the ways it plans to put emerging technologies like artificial intelligence (AI) and Internet-of-Things (IoT) devices to work:

### 1 QUALITY SURVEILLANCE

Partner: Operva AI

Drones with infrared thermographic scanners will be used to check building facades for potential air and water leaks as well as defects. AI will be used to automatically identify problems and conduct the repetitive audits, which will streamline the inspection process.

Right: What a thermographic scan of a building could look like.



### 2 CONSTRUCTION MANAGEMENT

Partner: Airsquare

AI will be used to combine images captured at a construction site by workers using 360-degree cameras into a virtual replica of the site. Project managers can then conduct virtual inspections remotely and compare the construction progress against building information models, which are digital representations of the building's design and features.



### 3 PROCUREMENT AND PAYMENT

Partner: Doxa

GuocoLand is exploring an end-to-end procurement solution with fintech firm Doxa, as well as an application to streamline facilities management. The platform will eliminate human error and improve productivity, GuocoLand said.

### 4 FACILITIES MANAGEMENT

Partner: SpaceAge Labs

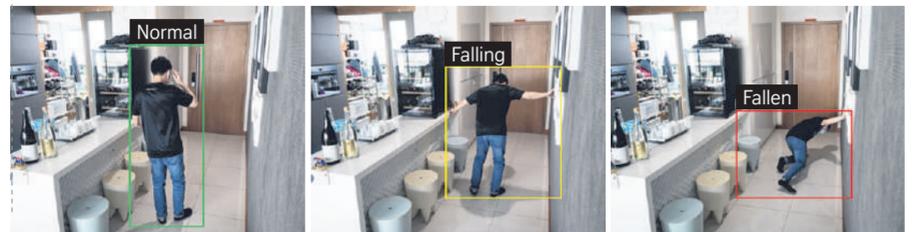
IoT smart sensors will be used to monitor lights in hard-to-reach locations, as well as water meters. Using machine learning, the system can then recognise normal consumption patterns and alert managers to anomalies like leaks. Managers can also manually monitor the usage data, which is updated hourly.



### 5 FALL DETECTION IN HOMES

Partner: Groundup.ai

Cameras installed in the home will be used to capture footage of elderly residents' daily activities. An AI model will then be trained to predict potential falls or detect danger. Incidents can then be immediately reported to family members, allowing them to respond quickly.



Source: GUOCOLAND PHOTOS: GUOCOLAND, ST FILE PHOTO STRAITS TIMES GRAPHICS



Cleaning robots such as those made by Triooo have been deployed at Guoco Tower in the Tanjong Pagar area to disinfect floors and maintain safety and cleanliness standards. Building managers use an app-based control system to manage the robots remotely. PHOTO: GUOCOLAND

tionwide by national water agency PUB. It announced earlier this year that 300,000 smart water meters will be installed in homes, and commercial and industrial buildings at seven new housing estates in Tampines North and Tengah, as well as Bukit Batok, Hougang, Jurong West, Tampines and Tuas.

### SMART HOMES, CLEANING ROBOTS

Older people living in GuocoLand's housing developments

could also benefit from AI in the form of safety monitoring and fall detection.

The developer said it is working with Groundup.ai on a system that uses cameras and computer vision to monitor residents' daily activities.

An AI model will then be trained to develop a predictive algorithm for detecting potential falls or other dangers, based on a resident's past movement patterns and behaviour.

If the system detects the elderly resident falling, or walking unsteadily and holding on to a wall even though he usually does not face issues with moving, it can send an alert to the resident's family member or caretaker who can respond quickly.

Besides these new partnerships, other efforts have already been implemented, such as allowing home owners at Martin Modern, a recently completed condominium in the River Valley area, to conduct

home inspections on their mobile phones through the Novade app.

GuocoLand has also been using cleaning robots, made by companies such as Triooo, at Guoco Tower in the Tanjong Pagar area to disinfect floors and maintain safety and cleanliness standards. Building managers use an app-based control system to manage the robots remotely.

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