



## CASE STUDY

# Smart City Taiwan – Using smart tech to deliver governance solutions

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The 'Smart City Taiwan' initiative was launched in 2018 by Taiwan's Industrial Development Bureau (IDB) under the Ministry of Economic Affairs (MOEA). Its aim is to further the accomplishments of past nationwide projects to digitise large swathes of Taiwan's infrastructure and public services, using innovative solutions to solve the challenges facing government, business and citizens in a modern economy. The 'Smart City Taiwan' initiative utilises a range of 'smart' technologies, such as IoT, Big Data and AI.

Solutions are provided as part of a so-called Public-Private-People Partnership (PPPP) model, bringing together the public and private sectors, alongside academic institutions such as the Industrial Technology Research Institute (ITRI). Taiwan's central government has committed to implementing policies that enable the delivery of solutions to address issues identified by local governments – with the aim that this collaborative approach can create solutions that can be exported globally.

Smart City solutions have to date been implemented in 22 cities and counties across Taiwan, even overseas to address issues around transport, healthcare, agriculture and governance.

This report looks at three Smart City case studies in the area of governance, which demonstrate use of digital services and applications that improve quality of life for citizens in a number of areas.



# Harnessing the power of AI to warn in advance of air quality issues – and identify sources of pollution

Air pollution is a major health concern in large cities across Taiwan, with many cities frequently registering in the “red zone”, indicating unhealthy air quality. However, it has been difficult for the authorities to collect evidence against businesses that break environmental laws. Collecting evidence is difficult as air pollution changes rapidly: it is estimated that in only 10 per cent of reported cases do inspectors arrive at the pollution source within 30 minutes.

The Smart City initiative sought to address this problem by building-out a platform with air pollution sensors in industrial zones that

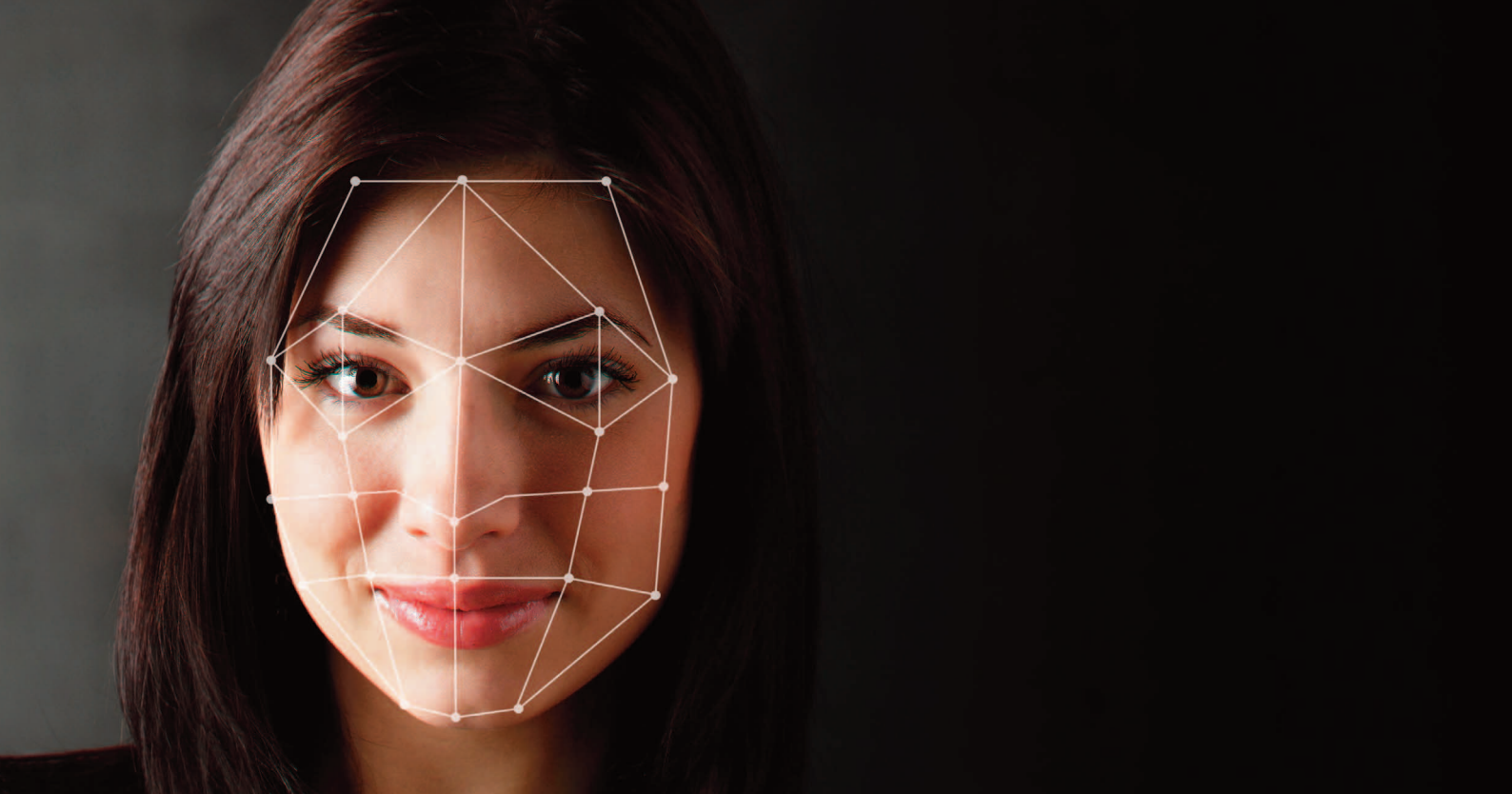
automatically detect environmental conditions such as temperature, humidity and toxic substances (including PM2.5, CO, O3, and NO2) at five second intervals. When combined with data such as time, wind speed, and wind direction, the system is able to precisely locate the source of pollution and provide early warnings of potential issues.

The platform – developed by CAMEO Company – combines data from IoT sensors, national monitoring stations, and private IoT sensors, monitoring in real-time 24 hours a day. This data is then processed by an AI algorithm that establishes an automatic air quality

prediction model able to provide a four-hour advance warning of changes in air quality. This machine learning-module is able to make predictions with a 70 per cent accuracy rate.

Since 2018, the platform has been rolled out to eight service locations across Taiwan. It resulted in a six-fold improvement in inspection efficiency by environmental protection departments. Evidence was able to be collected on-site at 11 factories that were subsequently found to be in breach of environmental regulations.





# First-of-its-kind AI image recognition solutions guards against dengue fever outbreaks

Taiwan has suffered several major outbreaks of dengue fever in recent decades, including one of the most severe in the country's recent history in 2015, which saw more than 43,000 cases and led to 228 deaths<sup>1</sup>.

The dengue virus is transmitted to humans via the bites of infected mosquitoes. The main strategy to control outbreaks during the summer months is to eliminate breeding sources and therefore lower the mosquito population density.

However, traditional methods of identifying and reporting larvae and eggs is time-consuming and ineffectual, requiring local

governments to monitor large areas and manually take photographs, which are then sent for identification. The process is complicated further by the fact larvae are often too small and difficult to identify with the naked eye, and due to lengthy delays in getting the data processed.

As part of the Smart City Taiwan initiative, Wistron Corporation has developed an AI image recognition solution – the first of its kind in the country – to tackle the problem, deployed initially in Tainan City. The technology is used to automatically categorize larvae and count the number of eggs from photographs

taken on site. Five sets of AI larvae identification models and three sets of egg calculation models have been built to improve accuracy. Photos are then processed to create a traceable database and AI larvae identification and egg count report.

This solution has been able to provide an instant early warning of dengue fever outbreaks, enabling public health agencies to respond quickly. Moreover, the man hours required to monitor the operation was reduced by 50 per cent, while the accuracy rate for identifying vector mosquito larvae increased to better than 90 per cent.

<sup>1</sup>[https://www.cdc.gov.tw/En/Category/ListContent/bg0g\\_VU\\_Ysrgkes\\_KRUDgQ?uaid=9\\_Oq7OYHa-l8B05iUwyVvQ](https://www.cdc.gov.tw/En/Category/ListContent/bg0g_VU_Ysrgkes_KRUDgQ?uaid=9_Oq7OYHa-l8B05iUwyVvQ)

# The 'flying robots' protecting Taiwan's industrial sites

In recent years enterprises have looked to drones as a way of expanding their surveillance, security patrolling and incident response efforts. This so-called 'flying robot' technology offers many advantages over traditional surveillance equipment, which is limited in its range and capabilities. It can also either replace or complement security guard personnel.

A commercial drone solution deployed as part of Smart City Taiwan is currently live across five regions and at several industrial sites. The solution enables security and industrial inspections using a smart fleet management system to provide on-site image capture and evidence collection. It combines

autonomous drones and an AI image processing system, which is able to patrol across large areas. The fully autonomous 'flying robots' are based at a landing platform (where they are charged) and remain on 24-7 standby. They then use smart route planning to operate either via automatic schedules or dispatched to where safety incidents occur to capture evidence.

The drone security application has been deployed at a number of sites across Taiwan, including the Tongluo Science Park, the Pingtung Mu-tan Reservoir and the Ta-wu Fishing Harbour in Taitung.

In 2020, the company building the drones, Coretronic Intelligent

Robotics Corp. (CIRC), announced it had successfully adapted its drones to work using the 5G network of Taiwan's largest mobile operator, Chunghwa Telecom. The two companies demonstrated remote drone inspection and real-time transmission of 4K live broadcast over 5G.

CIRC subsequently signed an agreement with Japanese mobile operator KDDI and South Korea's LG UPlus, to expand the market for the solution into Japan and South Korea, respectively. The two operators are expected to position the drone technology as a key use case on their 5G networks.





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### About the Industrial Development Bureau (IDB)

Industrial Development Bureau (IDB) is the administrative agency of the Ministry of Economic Affairs of Taiwan. IDB serves the role to formulate industrial policies, and to oversee various industries including metal & mechanical, information technology, consumer goods & chemical, knowledge services, as well as sustainable development in Taiwan. It is also the governing agency for the Smart City Taiwan initiative. The initiative aims at utilising all types of smart technologies (such as IoT, Big Data and AI) to effectively integrate local, industry, and civilian needs. With support from central government, collaboration and integration between local governments and industry stakeholders has resulted in many successful Smart City solutions originating from Taiwan being delivered to the global marketplace.

For B2B meeting requests with the companies in this case study or further inquiries, please email [service@communications.org.tw](mailto:service@communications.org.tw)



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