Success Story
Internet of Things
Empowering IoT Lighting for Neighbourhoods in Southeast Asia

AgilLiteS
Smart Lighting Solutions

Fast Facts

- Location: Asia

- Project Size: >10,000 lights

- Deployment: All common areas, lift lobbies, walkways & gardens, indoor carparks and outdoor carparks

- Savings: More than 50%

Asia's Largest Deployment of IoT-enabled Smart Lighting for Public Housing Estates

One of the key challenges facing any city planner is to develop environmentally sustainable housing estates that can accommodate a high density of population with no loss in the quality of life. To achieve this goal, city planners can leverage on IOT sensor networks to capture real-time information on the environment and analyse data collected to optimise maintenance cycles and pre-empt problems. Since lighting is ubiquitous and a major source of energy consumption in any housing estate, combining IOT sensors with dynamic on-demand lighting can achieve the dual purpose of reducing energy wastage and estate data collection for further analytics to improve on the planning of towns, precincts and building designs.

The promise of a more liveable, efficient, sustainable and safe environment for residents, enabled seamlessly by cost effective and smart technologies, is now within reach, and the latest proof is in this matured brown-field estate.

The deployed AgilLiteS Smart Lighting in the estate's common areas, lift lobbies, walkways, parks and gardens as well as indoor and outdoor parking areas provides a holistic approach in reducing energy consumption, ensure estates residents' safety and support license-free RF data communications and networking to integrate with other smart IoT-driven applications.

Challenges / Requirements

A leading Asian public housing developer wanted to upgrade its lighting network for one of its matured brown-field estate into a smart lighting solution with IoT sensors that:

- Conserve energy with dynamic on-demand lighting
- Collect sensor data for environment monitoring and maintenance optimisation
- Make citizens feel safe while contributing to energy savings
- Ability to manage indoor and outdoor lights in a single platform
- Tamper-resistant to vandalism

Outcome

- Improved lighting environment and experience
- Human-centric lighting and smart algorithm reducing light pollution
- Sensor and traffic data captured for analysis and movement-based optimisation
- Improve operations efficiency with centralised remote control & monitoring
- Build core network for future smart estate and IoT development

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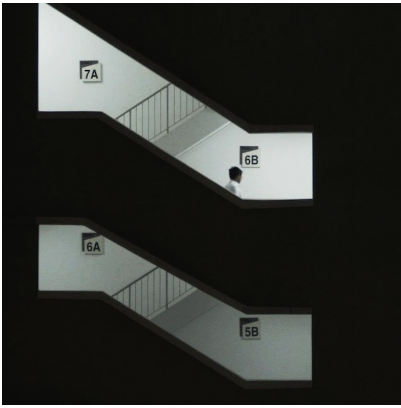
"We use smart lighting, not only LED lights to cut energy cost by 40% to 60%. We utilise data analytics from the embedded sensors to track movement to optimise lighting usage efficiency and to reduce carbon footprint."

-CEO & Spokesperson, Leading Asian Public Housing Developer

The Solution

AgilLiteS Smart Lighting uses wireless and infrastructure-free motion-based occupancy sensors and photocell daylight sensors to allow common lighting to be dimmed normally, and only brightened up when human or vehicle presence is detected, or when the sky is dark. Current sensor is also added to each light to provide on-condition monitoring of luminaires, allowing predictive maintenance to be carried out. The solution also captures traffic data for analytics and optimisation purposes.

Systematic Engineering Approach

A multi-disciplinary approach has been adopted to connect more than 10,000 luminaires with motion sensors wirelessly to a smart communications mesh network, managed through a single backend platform that provides on-demand lighting monitoring and control for over 40 resident blocks (covering common areas such as corridors, stairwells, gardens and walkways) and 7 surface carparks.

The efficiency of the estate maintenance is also improved with AgilLiteS' remote control and monitoring capabilities that gather reliable data on the luminaire lifespan, power consumption and lighting performance, automatic reporting of faults to maintenance crew as well as a failure prediction capability to enable predictive maintenance of any lighting fault before it even occurs.

Successful Commissioning of Systems

Common Areas: Pre-adjustment of lighting levels along corridors and stairwells, dimmed to 20% when no activity is sensed. Each light control module communicates with its neighbouring sensors over a wireless mesh network to brighten up the common areas upon movement detection.

Walkways, Gardens & Parks: Motion-activated lighting is offered by brightening up the dimmed lights upon presence detection of pedestrians and cyclists, coupled with predictive lighting for the pathway ahead of the pedestrians' and cyclists' moving directions, thus creating a "moving light cloud". The path ahead is always lighted in anticipation, offering greater sense of safety and security to residents. The lights will revert to dimmed level after a few seconds.

Indoor and Outdoor Car Parks: When there is no activity, lights are dimmed down to 20% to save energy. But once a car or human presence is detected, the surrounding lights will be lit to full brightness along the entire driveway of the car's moving direction.

Award-Winning Engineering Approach

After the green makeover of the public housing estate, the most immediate benefit is reduction in the cost of electricity - up to 55% on top of LED light savings. Lights can now be soft dimmed to any level to reduce energy consumption, and sensor data collected are used to optimised estate cleaning and maintenance. Residents have also reported improved visual comfort, due to the anticipatory lighting feature, with no abrupt turn on or off of lights.

The next step is to add additional devices (such as automated emergency light tester, temperature sensor, air quality sensor, etc.), riding on the deployed wireless sensor network, to improve estate management.
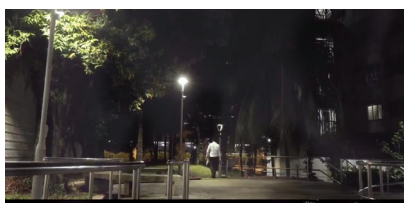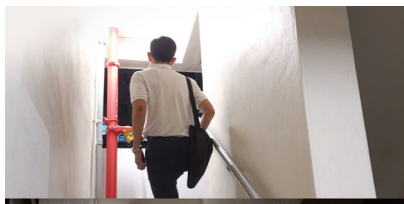
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