General

Smart Campus Innovation, IoT initiative targets energy savings at UMPSA

Tue, 09/22/2026 - 09:22

PEKAN, 16 July 2026 - Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) is reinforcing its commitment as a technology-focused university by advancing sustainability through a smart Internet of Things (IoT) system designed to improve energy management and enable real-time monitoring of campus facilities.

The initiative is led by Ts. Haji Mohd. Nurulakla Mohd. Azlan, a Senior Engineer at the Centre for Property Development and Management (PPPH) and a member of the Sustainability Committee's Energy and Climate Change Cluster. As principal researcher, he is spearheading this strategic effort to accelerate the university's Smart Campus digital transformation.

The IoT-based system has been developed to optimise electricity use through automated monitoring of campus facilities. It is expected to save 51,700 kilowatt-hours (kWh) of energy a year and reduce the university's annual utility costs by an estimated RM30,500.

Ts. Haji Mohd. Nurulakla said the system was built around a digital dashboard that allows data to be monitored in real time and analysed continuously, enabling management to make better-informed decisions.



"The system focuses on two main components: temperature and humidity monitoring, and automated lighting control at several strategic locations across the campus.

"For temperature and humidity monitoring, IoT sensors have been installed in several lecture rooms to track environmental conditions and detect air-conditioning use outside operating hours.

"Any unauthorised or unnecessary use can be identified immediately, helping to prevent energy waste.

"The automated lighting system also allows the lights at the futsal, basketball and volleyball courts, as well as the floodlights at the Student Activity Centre - now known as the Student Aspirations Complex (KAS) - to be controlled digitally through remote switches. This makes the management of university facilities more efficient," he said.

He added that the data collected by the IoT sensors was used not only for day-to-day monitoring, but also as an important reference for analysing energy-use patterns and planning more effective savings strategies.

"Smart technology also helps to extend the service life of electrical equipment because its operation can be monitored and controlled systematically, reducing the risk of excessive use," he said.

Assistant Vice-Chancellor (Development) Professor Dr. Mahadzir Ishak @ Muhammad said the Smart Campus IoT system also supported UMPSA's commitment to the Sustainable Development Goals (SDGs), particularly SDG 7: Affordable and Clean Energy through more efficient energy use, and SDG 13: Climate Action through lower carbon emissions resulting from reduced electricity consumption.

"The initiative also enhances UMPSA's reputation as a university that integrates Industrial Revolution 4.0 technologies into campus operations and research, strengthening its position as a Smart Campus leader among Malaysia's higher education institutions.

"Through this system, UMPSA is not only optimising resources and reducing operating costs, but also demonstrating its commitment to a greener, smarter, more efficient and more sustainable campus ecosystem for the benefit of the entire university community and future generations," he said.

UMPSA Vice-Chancellor Professor Ts. Dr. Yatimah Alias said she was proud of the project, which demonstrated the university community's ability to develop high-impact solutions that benefit campus management while contributing to the national sustainable development agenda.

"UMPSA consistently encourages a culture of innovation among researchers and the wider campus community, with the aim of producing technologies that deliver tangible benefits to society and organisations.

"The development of this IoT system shows how research can be translated into a practical solution that improves operational efficiency, saves costs and supports environmental sustainability.

"It is also aligned with UMPSA's aspiration to remain a leading technology university that harnesses digitalisation and innovation to strengthen its Smart Campus ecosystem," she said.

The initiative is aligned with the UMPSA Strategic Plan 2026-2030 (UMPSA30), which advances sustainability through eco-campus practices. It also supports the Ministry of Higher Education's aspirations under the Malaysia Higher Education Blueprint 2026-2035, particularly Shift 9: Sustainability (SDG/ESG), which emphasises sustainable campuses through smart technologies and efficient resource management.

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