

FIRST

Digital transformation set in motion

An overview of how Arup drives digital transformation for the betterment of the built environment



Foreword

The digital transformation in the architecture, engineering and construction (AEC) sector has created opportunities for improvement in performance, efficiency and cost-effectiveness. This has prompted Arup to drive digital transformation across all disciplines.

In 2018, Arup created a roadmap to support digital transformation initiatives at every level of its organisation. A digital executive board, comprising six executives, was also formed for the East Asia region to formulate and execute a regional digital transformation strategy.

This top-down strategy is helping move us from strategy to action — ensuring everyone across Arup recognises the digital opportunities available and makes them part of their daily activity through various task forces, programmes, training and workshops, research funding support and collaborations with external ventures and universities.

Our efforts have come to bear fruit. We are recognised as leaders in formulating innovative digital solutions that make the built environment more sustainable and resilient. In Hong Kong, for example, we have become a trusted partner of the city's government to support its smart cities initiatives.

Another case in point is Neuron, the smart building management platform initially developed by Arup. Earlier this year, it was spun off as Neuron Digital Group, a joint venture formed between Arup and Venturous Group.

Integrated with remote sensing, our AI-enabled digital twin technology has also been deployed to monitor critical infrastructures, such as offshore wind farms and rivers. This is increasingly important because it can help protect assets, make predictions and provide stakeholders with actionable intelligence.

While we have set a global digital transformation in motion, Arup's business fundamentally remains the same. It is always about providing deep technical expertise and innovative solutions to the toughest challenges our clients can throw at us.

FIRST is a publication produced by East Asia Arup University (AU) for our clients and partners, exploring design, innovation and technical solutions for the built environment. It takes its name from the unique model of AU: Foresight, Innovation, Research, Sharing, and Training.

If you have any thoughts, questions or comments, we would love to hear back from you at ea.arupuniversity@arup.com.

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Light up the way home

In a course co-organised with the HKU, Arup's Lighting experts taught HKU students on how night-time lighting design could create a sense of security for pedestrians.

In collaboration with the HKU's Common Core, Arup's Lighting experts from Hong Kong and Melbourne delivered a series of lectures and workshops between January and March this year, teaching participating students about how night-time lighting may cause people to perceive certain areas as safer than others.

Night-time lighting is one of the important elements in urban design. Perception of safety is a hidden mystery which correlates environmental design, crime control and design standard requirements. In Hong Kong, there is a growing need for a considerable human-centric night-time design that can provide convenience and safety to residents across neighbourhoods.

Apart from lectures, the series includes two workshops, in which students learned about night-time lighting principles, human-centred design approach, and global night management trends. Students also learnt hands-on skills of measuring horizontal illuminance (lx), vertical illuminance (lx), colour temperature (K) and colour rendering (Ra) during the evening field trips. After learning from class and fieldworks, students presented their reports to our Hong Kong and Melbourne experts at the end of the programme.



Students learned how to measure night-street lighting and its influence on residents' perceptions of street safety by taking field trips to several neighbourhoods in the evening.



The presence of well-lit streets with clean walkways gives an overall feeling of safety.

Lighting design principles

Lighting in residential areas is a complex decision that includes many factors. For example, designers can consider how to balance between sufficient lighting and light pollution in order not to affect residents' quality of sleep. However, there should also still be moderate lighting to increase safety and for those who come home late to notice quickly when threats emerge.

In a commercial area, it should be generally brighter for better visibility. Designers can also think of the balance between usability and aesthetic, such as festive decorations to attract more visitors and tourists.

When it comes to installing lighting, location matters. Certain urban areas may be designated for environmental or recreational purposes. It is important to consider the intended use of the area when installing lighting fixtures. The use of fixed ground-based light sources should also be considered when designing such facilities to prevent accidents from happening.

There is no one-size-fits-all approach to measuring night safety in Hong Kong, and there are many different aspects of lighting that should be considered. It is time for the existing Hong Kong night-time lighting designs to be reviewed and optimised if necessary to make it a safe, convenient, and inclusive city.

The collaboration with the HKU has also raised students' awareness of the importance of night-time and its strategic nuances in cultivating a safe and engaging environment for residents of neighbourhoods.