Smart Building: From Revitalization to Management: Achieving Sustainable Buildings

"Real estate has always been regarded as one of the most important personal properties. However, as building ages and maintenance cost increases drastically, the property can become a financial burden. Home should be a 'cosy nest' for its owner, but deteriorations such as water leaks, pipe bursts and spalling concrete can make bathroom and kitchen facilities more difficult to use, or even make entering or leaving home a challenge for the elderly. This immensely affects the inhabitant's quality of life, turning a cosy nest into a nightmare."

According to the Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030" ("Hong Kong 2030+"), a comprehensive strategic study conducted by the Planning Department, private housing aged over 70 or above will increase significantly from 1100 in 2016 to 326000 in 2046, a 300-fold increase. Building stock ageing will have a serious impact on citizens' quality of life. Moreover, many of the inhabitants of these buildings are seniors.

"To prevent this from happening, we need to take action early on. We need to mitigate building stock ageing by lengthening their useful lives and appropriately revitalizing buildings to satisfy the needs of the elderly in the face of ageing population," **Ling Kar-Kan**, Director of JCDISI points out.

Improving durability in buildings can be achieved through the utilization of new techniques and novel technologies in areas ranging from revitalization to building management. All of these create sustainable buildings that can improve the well-being of their inhabitants.

Application of Smart Green Technology

For Hong Kong, a city famed for its skyscrapers and concrete jungles, Smart Green Technology is crucial to its housing development and will become a major trend in the future.

Dr Benny Chow is a multi-awarded green architecture design expert. He is the Convenor of Steering Committee for Hong Kong Smart Green Building Design Best Practice Guidebook Including Interfacing with Smart City, **Hong Kong Green Building Council** and a Board Member of the International architecture design firm Aedas. He considers these innovations not only as a way to increase efficiency, but also help control cost-effectiveness and increase the quality of life. The adoption of interactive technologies and communicative infrastructure can increase the adaptability of buildings and facilitate the communication between facilities and its residents within and outside of the buildings. This maintains the health of the inhabitants and increases productivity.

Many local and overseas cases, such as One Taikoo Place, the Empire State Building in New York, The Edge in Amsterdam, have adopted a green approach to improving the functionality of new and existing buildings.

Dr Benny Chow, Convenor of Steering Committee for Hong Kong Smart Green Building Design Best Practice Guidebook Including Interfacing with Smart City, Hong Kong Green Building Council

Preventive Maintenance Slows Down Urban Decay

Hong Kong faces an urgent problem of urban decay, of which the lack of housing management and maintenance is one of the causes.

Mr Ben Lui, Executive Director (Operations), **Urban Renewal Authority**, pointed out that deteriorating buildings do not only affect the quality of life of their residents but also pose a risk to public safety. However, demolition and rebuilding require a great amount of time and resources. In addition, urban areas lack land sources for the temporary transfers of residents. Therefore, revitalization is the key to solving housing ageing in Hong Kong.

"Old buildings do not necessarily need rebuilding. The real estate is the owner's personal property. It is the owner's responsibility to actively maintain and improve the safety of the building. This is the way to lengthen the life of the building and promote sustainable development," said Mr Lui.

In light of this, URA established a promotional strategy of building revitalization that covers buildings of different ages. Through different subsidizing schemes, the authority provides financial and technical support for homeowners to conduct regular building maintenance. At the same time, URA collaborates with public and private organizations to promote preventive restorations, in the hopes of improving the health of the buildings.

Mr Ben Lui, Executive Director (Operations), Urban Renewal Authority

Cutting-edge Digital Technology Perfects Building Management

The popularization of digital technology and the integration of architectural systems have changed how buildings are managed. Building managers hope to own a centralized management platform to help monitoring and forewarning on one hand, and more effectively manage their properties on the other. Arup developed a smart management platform called Neuron. **Mr Jacky Chan**, Associate Director and Advanced Digital Engineering (ADE) Leader of **Arup** said "Using AI and machine learning, Neuron changes the traditional way of building operation and maintenance. The system offers functions such as trend analysis, system optimization, trouble-spotting and preventive restoration." This cutting-edge digital technology greatly improves building management and operation.

Existing digital technology and architecture system integration revolutionizes building management.
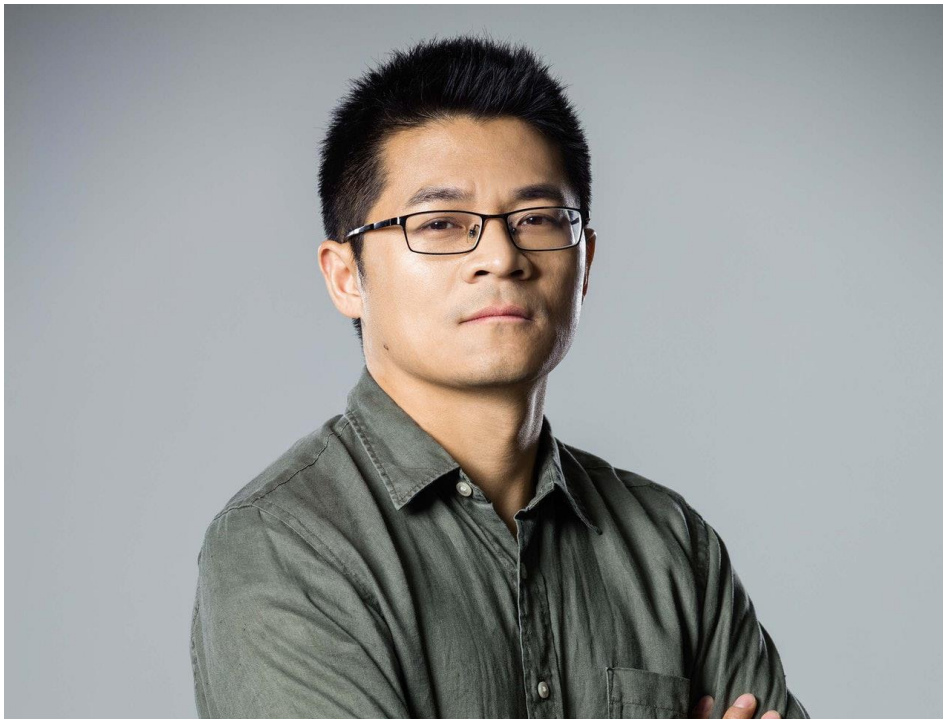
Mr Jacky Chan, Associate Director and Advanced Digital Engineering (ADE) Leader, Arup

Design for Public, Multi-faceted Urban Intervention

Like Hong Kong, China is also facing the problem of housing ageing. Many old urban areas have abandoned buildings such as the old courtyard houses in Beijing's historic district and the urban villages in Shenzhen. To address this problem, People's Architecture, the first B corp-certified architecture firm in Asia proposed an 'urban intervention' approach. **Mr Zhe He**, Co-Founder and Principal, **People's Architecture Office** said " 'Intervention' refers to active engagements in revamping urban environments which start small and finish big. The intervention can be categorized into four types: a plug-in micro revitalization, temporary and mobile, human-environment interaction and reuse of existing buildings. We sort our six design projects according to these categories and incrementally improve the urban environment."

People's Architecture proposes urban intervention for the incremental revitalization of old buildings.

Mr Zhe He, Co-Founder / Principal, People's Architecture Office

Social Innovation Regional Forum: Smart Housing to Tackle Double Ageing

Population ageing and building stock ageing are usually tackled as two separate subjects, and each has already received much attention. However, the combined impact of these processes of ageing, i.e. "Double Ageing", is a much more complex issue to address. The Jockey Club Design Institute for Social Innovation advocates that tackling this acute issue would require an integrated, people-centric "Double Smart" approach which leverages smart aging and smart city efforts holistically in order to enhance the sustainability, liveability and resilience of cities. The Social Innovation Regional Forum (SIRF2020) organized by JCDISI of PolyU under the project PolyU Jockey Club "Operation SoInno", will invite the aforementioned experts as forum's speakers. The panel discussion, moderated by **Dr Calvin Luk**, Project Manager (Spatial) of JCDISI will explore the ways in which innovative digital technology transforms architecture.