

Editorial: sustainable and resilient built assets for smart cities

The trend of smart city is developing fast and the issue of sustainability poses research questions, especially in terms of the high information and communication technology content of associated construction. How buildings can cope with ever-evolving changes also call into question the resilient issues. This special issue is warranted to disseminate the related knowledge base in the light of project and asset management. The aims of the proposed special issue are to disseminate new knowledge and best practices for enhancing the sustainability and resiliency of smart cities, especially in the arena of project and asset management in the long term. Smart cities should be built with sustainability and/or resilience in mind, to avoid misfit in the era of quick changes. As a lot of processes are information-driven nowadays, especially in the construction of smart city projects, the community should consider what to expect when encountering such projects. Although the literature has smart city topics (mostly on technical innovations) from time to time, the sustainability and resilience issues are not well-covered. This special issue will address those important issues.

The Conseil International du Bâtiment (CIB) World Building Congress 2019 (WBC 2019) is regarded as the leading construction research and innovation conference worldwide. On 17–21 June 2019, the conference took place in The Hong Kong Polytechnic University with the host being the Department of Building and Real Estate. This triennial international congress facilitated the in-depth exchange of research ideas on smart city and fostered the close collaboration between academia and practitioners. Presentations, panel discussions, workshops, networking events and site tours were offered participants invaluable opportunities to interact and meet industry forks from across the global communities and gained knowledge and insights into the creation of the smarter cities of the future. During the congress, insightful discussions and inspirations in relation to the sustainability and/or resilience of built assets were given in sub-themes (smart building and infrastructure, smart environment and smart services), and the task group (building regulation and control in the face of climate change).

Built upon the research works presented in the CIB WBC 2019, outstanding conference papers were selected and invited for up-dating, upgrading, expanding and enriching the contents with new findings, more in-depth analyses and/or an application and/or validation which were accepted for publication after rigorous peer review in this special issue of “Built Environment Project and Asset Management”, which aims to increase the awareness of sustainability and resilience issues when fostering the development of smart cities. Highlights of each paper are provided below for readers’ reference.

Paper 1: Implementation of age-friendly initiatives in smart cities: probing the barriers through a systematic review

Nowadays, cities are becoming smarter. The life expectancies in cities, however, have steadily increased at the same time. As such, it is important to promote a supportive environment for older adults in pursuing active ageing. The opening paper by Alex Torku, Albert P.C. Chan and Esther H.K. Yung conducted a systematic literature review to identify the barriers that hinder the implementing of age-friendly initiatives in smart cities being coined as age-friendly cities by the authors. A total of 39 publications from Scopus database were selected to systematically identify and categorise the barriers. The content analysis method was



introduced to categorise text data and distinguish the age-friendly cities research themes. As a result, five key groups and barriers (i.e. physical/environmental characteristics, technological barriers, social barriers, financial barriers and political barriers) were identified, and possible measures to overcome the barriers were also proposed. The above-identified barriers have the potential to be considered as the essential elements for establishing key policies and strategies in promoting age-friendly smart cities.

Paper 2: Investigation of waste diversion rates in the construction and demolition sector in Australia

Globally, the construction industry is a major culprit responsible for solid waste generation. Waste management research, within the main body of broader sustainability research, has become a very important research trend within the built environment. In line with this trend, the second paper, by Shiyamini Ratnasabapathy, Ali Alashwal and Srinath Perera, attempted to promote the applicability of waste diversion rate as an effective waste management tool. This timely research is conducted in Australia and is based on a mixed-method approach (a desk study and a case study). Even though the scope of the case study analysis was limited to residential projects in two Australian states (New South Wales and Victoria), the research gives an insight into the importance of waste diversion rate in built environment in evaluating the waste management performance in the construction and demolition waste sector.

Paper 3: ICT as a solution for the revitalization of public open space in private developments

In the process of rapid urbanisation, provision of public open space has become a vital feature and a community resource in revitalisation programmes. The third paper, by Izzy Yi Jian, Edwin H.W. Chan and Terry Ye Peng Yao, looked into public open space from the perspective of a smart city using technology. The research study was conducted in Hong Kong. A comprehensive methodology was proposed by establishing a public open space in private developments database, followed by conducting geographic information system analysis. The study analysed the existing situation of public open space in private developments from information justice perspective with the intention of promoting public participation in the revitalisation of public open space in private developments. The authors envisioned an information-driven platform, which will be accessible by the public, will help in making convincing urban policies such as public open spaces in private residential developments for resilient public assets in smart cities.

Paper 4: Mediation effect of partnership on procurement strategy factors influencing sustainable smart housing development, Nigeria

To encourage sustainable smart housing development, which involves sustainable housing designs and resilient management of facilities, the use of procurement strategy has been identified as one of the challenges in developing countries. The fourth paper, authored by Innocent Musonda, Nuru Gambo and Bauchi Nigeria, applied a holistic system approach to assess how the mediation effect of the technology partnership on procurement strategy can influence smart housing development. The research study conducted the questionnaire survey to collect the perceptions of totally 300 project managers in the Nigerian construction industry. Then, a partial least squares (PLS) algorithm was employed to perform the regression analysis on the directional hypotheses. The regression model ascertained that the technology partnership mediating roles could minimise procurement strategy challenges and enhance sustainable smart housing development in Nigeria. This study provides a strong foundation, especially in developing countries, that construction firms should adopt a

technology partnership culture in their construction contract business to increase productivity and support smart housing development. Guest editorial

Paper 5: Claim tenability assessment in Indian real estate projects using ANN and decision tree models

The last study in this special issue, which was conducted by Himanshu Rai, Murali Jagannathan and Venkata Santosh Kumar Delhi, proposed an artificial neural network/decision tree-based prediction model aims to predict claims tenability in Indian real estate projects. The input database was prepared based on the existing literature and practical construction projects. Four groups of important input factors (human, process, project and external factors) were first identified and collected from the existing literature along with the 300 instances of claims given by eight India residential projects. Then, cross-model analysis was carried out to characterise the consistency of the causation of certain factors affecting claim tenability. Finally, inconsistency between drawings and specifications (human factors) was identified as the most influencing factor. The proposed method performed a high accuracy and feasibility in assessing the risk of disputes or claims on a construction project, which can be contributed to systematically analysing the trends in the past claim tenability data and achieving smart asset management.

We hope that the readers enjoy reading the above selected research articles focussing on the sustainability and/or resilient built assets in smart cities. Last but not least, the editorial board of this special issue would like to acknowledge the unreserved support and technical assistance given by the followings: the editorial board and administrative staff of “Built Environment Project and Asset Management”, the CIB WBC 2019 host organisation (academic staff in the Department of Building and Real Estate, The Hong Kong Polytechnic University), the authors and reviewers who have generously contributed to this special issue and the research students associated with the lead guest editor (Dr. Ling Helen Chen, Ms. Siwei Chang, Ms. Suet Wai Tracy Cheung and Mr. Siu Hang Lee).

Lastly, we would like to add that *Built Environment Project and Asset Management* is an internationally established Emerald journal. It is a CIB “recognised journal” that is recognised by the Australian Business Deans Council and indexed in renowned databases such as SCOPUS, EBSCO, INSPEC, as well as in ESCI (Emerging Sources Citation Index) of Thomson Reuters. For more information of the journal, please contact Professor Mohan Kumaraswamy at his email addresses mohan@hku.hk or visit the journal website: <https://www.emeraldgrouppublishing.com/bepam.htm>.

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