Student Participation in Digital Future : Design and Development of Construction Risk Planning Model for Digital Twin* in Hong Kong ACE Industry

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Abstract:

Past CIC (Construction Industry Council, HK) reports indicate that there is a lack of responsive instrument to assist ACE students with addressing learning of effective construction risk planning. Current textbooks/ notes are primarily text-based standalone check-sheet type tools which are either accessed via paper or software interface. Nowadays, the current and growing movement of BIM and Digital Twin in the construction technology curriculum [e.g. 6-D BIM (China), National BIM Standard – US Version 3 (USA) and Building SMART and infraBIM (Finland), etc.] is offering new means and approaches to improve the inefficiencies of paper-based processes.

Our TDG team are try to trialling this technology on two of Hong Kong foundations sites, where it is producing a visual representation of real-time and historical plant locations and progress to provide the project teams with a platform for improved risk planning and greater understanding of construction activities.

This technology is not just for the benefit of the local contractor, however, for our future engineers, we will be able to deliver a complete asset of information in the form of a digital model at project completion, containing all the necessary information to allow the facility to be successful managed throughout its operational life. And as the asset model is developed throughout the duration of the project, we can also grant early access to our teams so the facility can be better understood upon handover.

Our team try to enhance and improve our Digital Twin capability, such as adding support for more data types and including more sites and functionalities. In essence, we aim to eventually deliver each of our projects twice: once in the digital virtual environment and once in the real world.

Based on the basic concepts of elements of Risk Planning Model, and aligned with Discovery-Enriched Curriculum (DEC) by EDGE at CityU, a sub-model of risk planning for Digital Twin will be proposed with intensive student participation. Among with "Discover & Innovate" culture, the student-based planning model will be developed into more detailed for considering different scopes of construction project (e.g. builder's work, civil engineering work and renovation maintenance, alternation and additional work, RMAA, etc.). After a series of DEC with D&I activities, such as site visits and brainstorming workshops, construction students can design their "optimum" risk plan with

corresponding risk assessment for each scope of construction project/ work (after visiting & studying the real project) by referring to the Safety and Risk Management Instructor Programme (developed from Labour Department). Student will learn what it means to create new knowledge, communicate it, curate it, and cultivate it to benefit AEC industry. Finally, selected outputs of the student submission will be participated in OSHC Best Project Award Competition 2022 held yearly by Occupational Safety and Health Council in Hong Kong in terms of pubic and professional assessment.