



Talk on International Architecture, Engineering and Construction (AEC) Practices in Building Information Modelling (BIM) – Underground Infrastructure Development

by Ir. Khoo Chee Min

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Making a move to the Industry Revolution (IR) 4.0, the Tunnelling and Underground Space Technical Division (TUSTD) had also get on the bandwagon to organise an evening talk on Building Information Modelling (BIM) focusing on underground infrastructure development since BIM is one of the recent hot topics in the global construction industry. The talk entitled “International Architecture, Engineering and Construction (AEC) Practices in Building Information Modelling (BIM) – Underground Infrastructure Development” was delivered by Ir. Dr Julian Lee (Chief Executive/ Founder of Cinnotek International Group) on 13 March 2019, at Auditorium Tan Sri Prof. Chin Fung Kee, Wisma IEM. It was well received with a total of 50 participants in attendance.

BIM, as a new digital tool, is changing both the building and construction processes and provides an effective platform for AEC professionals to develop, boost productivity and monitor projects throughout its whole lifecycles (Figure 1). By setting this background information, Ir. Dr Julian Lee started his presentation by defining what is BIM. He emphasized that BIM is a process involving the generation as well as management of digital representations of both physical and functional characteristics of a facility creating a shared knowledge resource for information. As the saying goes, 3D modelling or use of BIM software as BIM practice is a myth. Far from it, BIM extends this beyond 3D, augmenting the three primary spatial dimensions with time as the 4D and cost as the 5D.

More recently there are also references to a 6D representing building lifecycle facility management aspect, although there are conflicting definitions for 6D BIM. He continued to discuss on the Level of BIM Maturity, which is typically categorised into four “levels” as shown in Figure 2. From traditional building design reliant upon two-dimensional technical drawings (Level 0) to those using a fully integrated web-based database system that can be accessed by all relevant members of the construction team (Level 3). For the professionals involved in a project, BIM enables a virtual information model to be handed over from the design team to the main contractor and subcontractors and then on, to the owner/ operator; each professional adds discipline-specific data to the single shared model. This reduces information losses that traditionally occurred when a new team takes ‘ownership’ of the project, and provides more extensive information to owners of complex structures.

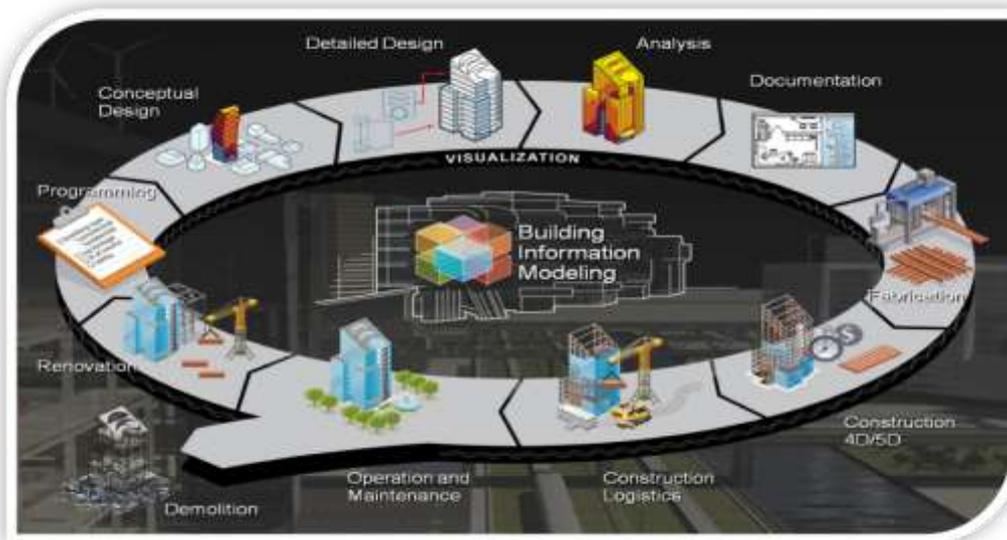


Figure 1 : BIM is a lifecycle approach

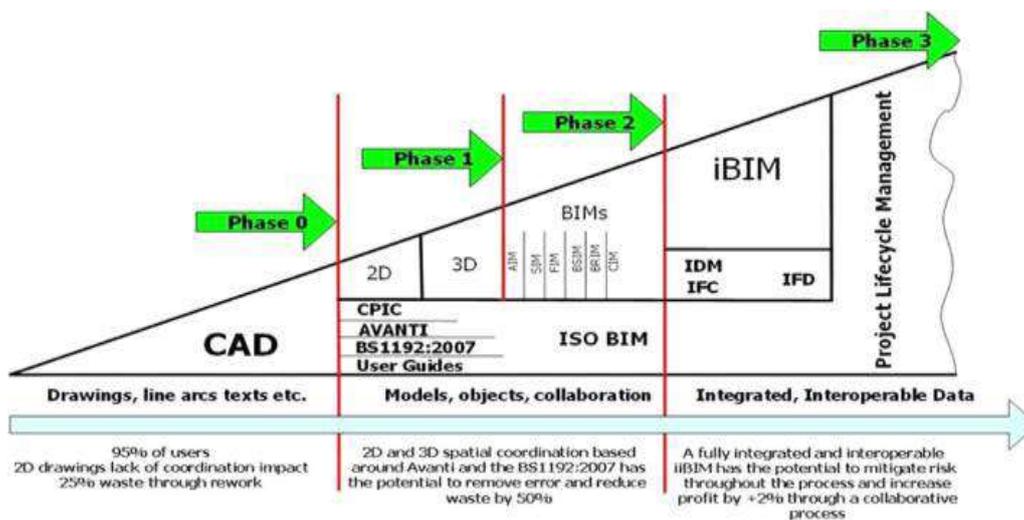


Figure 2 : BIM Maturity Model (Bew and Richards, 2008)

Ir. Dr Julian Lee presented the international BIM practices in underground infrastructure development among those, are from United Kingdom, Hong Kong, Singapore and Malaysia. The idea to implement BIM in Malaysia was introduced by the Director of Public Works Department (PWD) in 2007. Its implementation is targeted towards BIM Level 2 by the year 2020 led by Construction Industry Development Board (CIDB) whom is expected to establish a roadmap aims to provide a clear direction for industry players and streamline future programmes related to IR 4.0, in particular, the Building Information Modelling. Ir. Dr Julian shared the application, policies and guidance, budget and funding, acceptance survey as well as the software used in BIM implementation in these countries. The trends of AEC consultants' practices in BIM globally that are not only for building projects but also for infrastructure projects were also discussed. Certain cities in some countries have made the adoption of BIM for capital works projects mandatory.

The successful adoption of BIM in changing the traditional workflow toward both reality modeling and point cloud data in verification of as-built tolerances, asset information modelling and geographical information system (GIS) was demonstrated in the recent Malaysia MRT infrastructure project as well as other worldwide projects. The collaboration between stakeholders in Malaysia and its global partners provides a clear indication of a firm commitment in both the promotion and adoption of BIM technology to improving the processes of design, construction, project management and asset management.

In conclusion, Ir. Dr Julian discussed on factors which are required to overcome barriers to facilitate BIM application with particular attention to workflow, procurement, and contract & legal matters. Both challenges and future prospects in response to the inevitable coming of the digital transformation era for the construction industry among AEC consultants were also briefly discussed.

The talk ended with an active question and answer session. After which, a token of appreciation was presented to the speaker by the Founding Chairman of TUSTD, Ir. Dr Ooi Teik Aun.



A token of appreciation being presented to the speaker, Ir. Dr Julian Lee (left in the photo) by Ir. Dr Ooi Teik Aun