FROM 3D TO nD MODELLING

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EDITORIAL

One of the principal challenges facing the construction industry today is how to improve the efficiency and effectiveness of the design and construction process. Moreover, what contribution can the effective use of information technology make to this?

Recent years have witnessed a major change in the approach to construction innovation and research. There has been a huge concentration, from both the academic and industrial communities, on the development of a single building/product model and/or on the expansion of 3D CAD modelling with other design attributes (such as time and cost). nD modelling expounds by bringing together an nth number of design perspectives. Thus, an nD model is an extension of the building information model that incorporates multi-aspects of design information required at each stage of the lifecycle of a building facility; including scheduling, costing, accessibility, crime, sustainability, maintainability, acoustics and energy simulation. We believe that nD modelling is a realistic potential for an improved construction industry. It is an integrated tool that will enable construction stakeholders – across time zones – to cohesively and comprehensively work within their own specialised discipline on one model. Thus, they can negotiate and collaborate to bring about an improved design by enabling true what-if analysis of design decisions. The information in the model is linked, so that when design information is changed, for example, the cost of the project will also change to reflect the new design.

This Special Issue presents a constituent of the work that is being undertaken globally – forwards and towards an nD-enabled construction industry. The series of 6 papers address a wide variety of issues central to ensuring the realisation on an nD-enabled construction industry. The papers either directly demonstrate or prove the potential of nD modelling, from a component perspective (concrete structures) to an urban scale (city modelling), and will hopefully trigger a quantum leap in the effective use of IT in the construction industry:

- Jongeling et al utilises the nD concept specifically on the development of cast in place concrete structures,
- Bouchlaghem et al concentrate specifically on the engineering dimension of nD, with particular attention paid to energy efficiency,
- Ganah et al presents the VISCON tool, a computer visualisation and communication support for constructability,
- Tse et al discuss the utilisation of building information models in nD modelling, concentrating specifically on the data interface and adoption barriers,
- Dawood et al presents the VIRCON tool, which assists construction planners to make accurate and informed planning decisions based on the allocation of the execution space,
- Hamilton et al presents the concept and challenges of an nD urban information model. The need is for the consideration of the interplay between multi-aspects of a modern city, such as transport, pollution and crime.

The papers selected papers in this Special Issue present a useful insight into current issues related to nD modelling and should be an attractive read for those researchers and practitioners whom are interested in the future of construction IT.