

Title: Building Information Modelling and Sustainability

Sub-Title: The application of BIM analysis software for increased sustainable educational building performance

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Purpose: The rationale for conducting this research came from the author's previous research into Building Information Modelling (BIM) at undergraduate level and from experiencing its potential on a major previous project in the United States. In Ireland limited research had been conducted into the area and the majority of industry professionals were unfamiliar with the concept. The overall aim of this research was to evaluate the application of BIM performance analysis software in order to increase sustainable building performance. It was anticipated that the research conclusions and recommendations may guide the procurement of future sustainable educational facilities.

Methodology: A thorough literature review was conducted into the area with the majority of information from international sources, due to the lack of information in Ireland. The primary research strategy adopted was a case study approach as it allowed for the complexities of the BIM process to be investigated in its application throughout the project lifecycle. The method of primary data collection was through the use of semi-structured interviews. The data by nature was qualitative and allowed for the participants to develop certain issues with which they had particular expertise. There were seven participants interviewed from Ireland, Europe and the USA all of whom had a vast amount of experience and a range of BIM expertise.

Findings: The use of BIM performance analysis tools for increasing sustainable building performance was currently being recognised in its early stage and was being developed further. The full potential of the software however was limited and often utilised only through some of the lifecycle phases. The limiting factors that were identified were mainly due to underlying issues of training and awareness, exposure to the software and reluctance of AECM professionals to embrace it. In addition to this, the risk of investment into new software and the cost implications of the change process especially from 2D to 3D hindered its uptake. Successful implementation of the software appeared when clear rules and guidelines were established and communicated to all project team members, when the client organisation requested it and also when it was implemented as early as possible in the pre-construction phase. Recommendations to Irish and various state public capital project directors are to exploit the advantages of BIM performance analysis through pilot projects on new and current facilities and develop feedback processes to utilise knowledge created. Further recommendations include the development of guidelines and standards for its effective deployment in the future and further Post Occupancy Evaluations (POE) of operational facilities.

Keywords: Building Information Modelling (BIM), Building Performance Analysis, Sustainable Construction, Building Rating Systems, Energy Simulation

Classification: Information Communication Technology (ICT)