

Implementation of Building Information Modeling (BIM) in Construction: A Comparative Case Study

INTRODUCTION

The adoption of Building Information Modeling (BIM) processes in the Hong Kong construction industry has evolved in an ad-hoc manner to date with a number of different parties providing BIM services and software solutions. A number of client organizations such as Henderson Land have specified that BIM must be adopted in their design and construction projects. Some clients directly lead the implementation, training, and management of the BIM technology. Others require consultants to offer BIM solutions for each project, in which cases the architects, engineers and contractors appoint independent BIM Consultants to assist in the planning and management process. The larger design consultancy firms such as Ove Arup & Partners have invested in developing BIM solutions, making the technology accessible to all of their staff. As for contractors, large firms such as Leighton or Gammon use BIM to review construction sequences and to communicate planned tasks to the sub-contractors and local authorities. In September 2008 the Hong Kong Institute of Building Information Modeling (HKIBIM) was established, aiming at promoting and advancing the education, understanding, appreciation and interest in BIM in Hong Kong. If construction projects are to be more effective, this will come as a consequence of greater integration of communications across the temporary project organisation^[5].

LITERATURE REVIEW

The demand for BIM is being driven by the potential for cost savings resulting from shorter project time horizons, less design clashes being issued on the project site which in turn results in fewer delays and cost overruns. As such, the adoption and utilization of the BIM process will require top management support and ultimately need to be demanded by the client^[6]. Major construction projects involve several key parties that require a great deal of

direction in order to complete a project effectively^[5, 7]. Collaboration between key parties, such as architects and structural engineers, is critical in accomplishing this goal. The use of BIM technology enables a unified master dataset accessible to all stakeholders of a project, thus facilitating the increasing communication between traditionally segmented parties in the construction process^[3, 8].

The aim of BIM implementation is to create a centralized shared knowledge resource that contains all the necessary design and operational information about a project^[9]. 3D technology had been used to present design proposals, with no real on-site application and no ethos of cooperation amongst team members to drive its use. BIM has taken this concept to the next level by using actual engineering and architectural data to create the 3D models as opposed to creating the models with artistic 3D design software. This allows for a 3D model to be updated by way of changing the database containing the specifications and not the actual model itself. With this advantage, BIM is used to identify and reduce the number of errors and design conflicts and requests for information (RFIs) before the project ever breaks ground^[10]. Centralizing the dataset also has the benefit of maintaining a consistent format of data which reduces the confusion experienced by different specialists interpreting information.

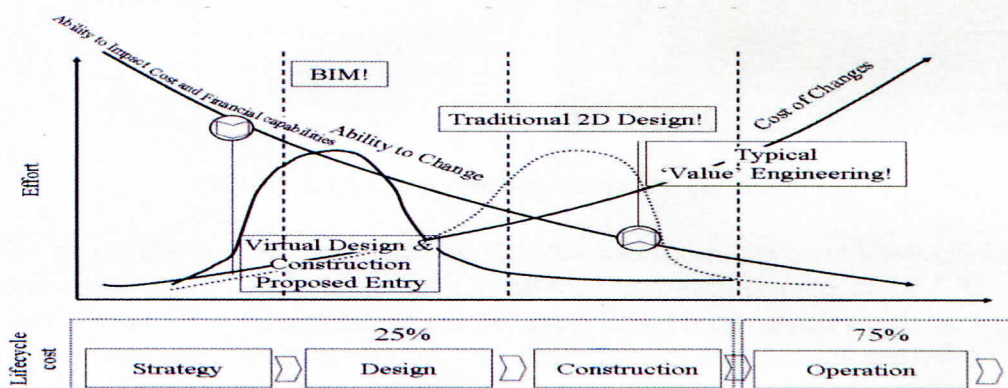


FIGURE 1. Opportunities gained through BIM