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ScienceDirect

Procedia - Social and Behavioral Sciences 141 (2014) 763 – 767

Procedia
Social and Behavioral Sciences

WCLTA 2013

BIM – The Process Of Modern Civil Engineering In Higher Education

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Abstract

BIM (Building Information Model) as a process is known from the seventies, but with increasing pressure from investors to reduce construction costs we can assume its massive use. On large construction sites, it could not be managed without it in the future. This contribution analyses the current situation of the use of BIM in teaching resources, streamlining its use in modern architecture with sufficient education of all participants and also indicates which methods streamlines the current design activity.

Keywords: BIM, Building information modelling, CAD, 3D model, Process;

1. Introduction

Technological advance in the field of technical coordination and simulation provides new methods in construction (BIM, Building Information Modelling), which will improve the process of safety, quality and last but not least efficiency.
The lack of people able to work with a comprehensive BIM is now a major barrier for use of these technologies in architecture and civil engineering. The essence of improving this situation is not to implement the subject called BIM but to teach students to “think BIM” across all related disciplines. In the Czech Republic, the students are already working with BIM technology but only marginally, especially with 3D models. However, they do not realize all connections through the whole BIM process.

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doi:10.1016/j.sbspro.2014.05.134

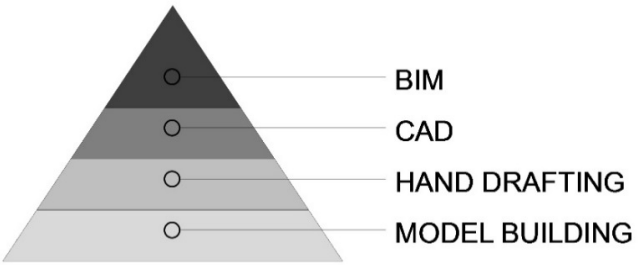

Fig.1 BIM is built on the solid foundations
that have been built by previous building technologies [1]

2. BIM – Process

Today, BIM is perceived only as software (mainly due to advertising campaigns software companies). However, BIM should be seen not only as software but as an integrated process (Fig.3). On the other side, the use of the ideas of building information modelling principle in construction practice would not achieve such progress without innovations in information technology, software and hardware included.

3D model of the building is often wrongly considered to be the Building Information Modelling (BIM). It should be noticed that BIM is essentially a package of data, which may involve all relevant information throughout the building life cycle, from design, construction, management of buildings, renovations to its demolition. 3D model is only one of many possible ways of interpretation of this information. For the designer, 3D model is undoubtedly useful function but other participants in the construction process may be interested in differently interpreted information. For example, besides the appearance of the building, an investor could be interested in the overall construction costs, construction schedule, drawing resources during construction. And structural engineer needs data necessary for static calculation.

It is also important to mention the fact that each participant in the construction process must contribute by the information into this database. BIM is based on the cooperation of each construction processes. If the one of the elements of these processes refused to share the information generated by him, this method will not work. The transition to BIM (building information modelling) will place new demands on the knowledge of all participants of the construction process throughout the life cycle of buildings. This transition is often compared to the transition from the drawing board to design by computer (CAD). Long-term stagnant work productivity in construction forces different actors to changes even in such conservative field as construction (in other fields of human activities, automation technologies were used more effectively than in the fields related to the construction).

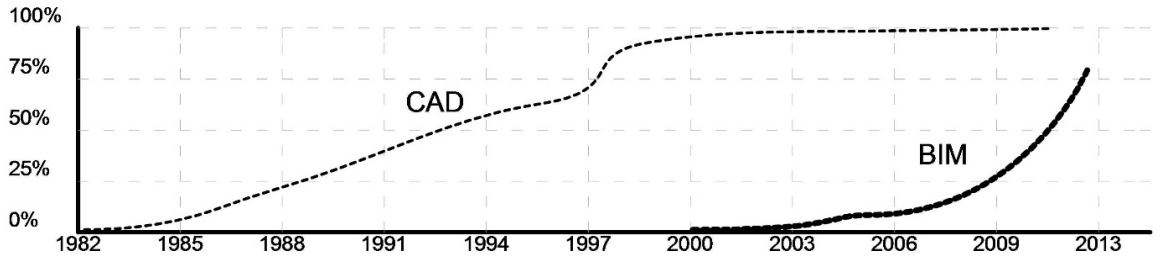

Fig. 2 The process of implementation of a new way of working in the UK / USA. BIM has been implemented here twice faster than CAD in its time [1].