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Procedia - Social and Behavioral Sciences 106 (2013) 3320 - 3328

4th International Conference on New Horizons in Education

## Virtual design and management of construction projects in educational process

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#### Abstract

In the present, a priority theme of science and research in the field of design and management construction is aimed at transforming the construction sector through the rapid adoption of new processes, such as Integrated Project Delivery (IPD), Integrated Design and Delivery Solution (IDDS) together with Building Information Modelling (BIM) and automation technologies, using people with enhanced skills.

It is necessary to transfer the idea of cooperation among the participants of construction process into the pedagogical process as soon as possible. An educational project focused on the skills development for virtual design and management of construction based 5D technologies, solved to the Civil Engineering Faculty of Technical University of Kosice (Slovakia), dealt with an innovative form and content of teaching in field of design and management of construction projects. This paper describes the main goals, opportunities and results of the mention project, which can develop the professional, communication and managerial skills of students in the joint working teams using the latest digital and automated systems of design.

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Keywords: virtual design, construction projects, construction, educational process

#### 1. Introduction

Considering the increasing of construction complexity (constructive, material and technological difficulty) and the pressure of market for quality and efficiency of construction on the one hand and the shortening deadlines for

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construction process on the other hand, the current methods of project documentation processing and the management of construction planning processes seem to be insufficient. However, the global civil engineering in suffers with mistakes and misunderstanding in communication among the participants of construction project from the very beginning of an investment plan to its realization. This fact seems counterproductive to the very complex efficiency and performance of construction work, including the stage of using.

Accordingly, there is need to monitor the worldwide development towards necessity of structural, technical, technological, qualitative, economic or using requirements and solutions integration in construction projects. The global improvement of the projects cannot be achieved by development of only optimal solution but by complex perception of all parameters of the building projects in all its phases (design, preparation, realization, using) in term of all aspects (quality, safety, environmental suitability, energy efficiency).

#### 2. New concept for design and realization of constructions

The development in fields of engineering support and project tasks directed from a very heterogeneous software environment to integration into more comprehensive tools. The design, construction and commissioning sectors repeatedly analysed as inefficient (Šoltés, Kozlovská, 2011). Actual design tools and delivery solutions for building projects are:

- Unproductive
- Uncommunicative
- Over time and budget

Traditional Design and Delivery tools of construction projects must undergo a fundamental structural change. The studies indicate that the development in support of engineering and project tasks directed from a very heterogeneous software environment to integration into more comprehensive tools. The difficulty of building structures as well as the investors requires more interconnected information environment which is consisted by the base of information and data about whole construction elements and structures.

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