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ScienceDirect

Procedia - Social and Behavioral Sciences 119 (2014) 557 – 565

Procedia
Social and Behavioral Sciences

27th IPMA World Congress

Integrated project delivery as integration between solution development and solution implementation

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Abstract

The literature dealing with general management recognizes two important phases of any project's and product's life cycle, the solution development and solution implementation. Both of the phases have been explored on the case of IT industry and the model recognizes two important variables: number of agents and level of interdisciplinarity. This paper will try to determine whether such an approach is also appropriate for the construction industry and will also try to prove whether design and build is an appropriate method of integrating the design (solution development) and construction (solution implementation) phases of a construction project because even though design and build is an integral part of many other manufacturing industries, that is not always the case in construction industry.

This proposed solution is in line with the knowledge based approach of the previous research because it enables the design team and the implementation team to work together from the earliest phases of the project, therefore enabling the iterative design process and learning from one another.

The results of the paper would be useful not only to further scientific research but also as evidence to support the implementation of design and build in the countries in which the legislation discourages its use.

Keywords: Design & build; Project integrated delivery; solution development; solution implementation; construction projects.

1. Introduction

Integrated methods for project delivery, such as design & build (D&B), have been around for a while now. Over the recent decades more and more project delivery methods emerged as a way to bridge the gap between the

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doi:10.1016/j.sbspro.2014.03.062

planning and construction phases of construction projects, since the traditional delivery methods have shown to be not sufficiently efficient. In fact, a study of the US Bureau of Labor Statistics in the United States found that construction is the only industry (excluding farm industries) that has decreased its productivity since 1964, while all the other industries have increased productivity at least by over 200% in that same time period (AIA, 2007). Moreover, "…an Economist article from 2000 identifies 30% waste in the US construction industry; a NIST study from 2004 targets lack of AEC software interoperability as costing the industry $15.8B annually"(AIA, 2007). For example, a study by Sacks and Partouche (2010) suggests that the mean speed of construction has been on the decline since the Empire State Building. It has been built in only 13 months' time, a feat deemed remarkable by today's industry. There are many factors potentially responsible for this decline in productivity, one of them being the project delivery methods. Those problems mentioned in the US plague the construction industry in other countries as well.

The traditional delivery method used in most projects is the Design-Bid-Build method. The problem which arises from the use of this method is the lack of communication between the two distinct phases of the construction project's life cycle: the solution development and the solution implementation phases. Therefore the Authors have decided to test if the integrated delivery methods, primarily the Integrated project delivery (IPD), are suitable for bridging the gap on the basis of the previous research on the number of agents and the level of interdisciplinary in those project phases (Sertic & Zavrski, 2012).

This paper will also include a regional aspect. It will discuss whether it is possible to implement IPD in the Croatian construction industry. After reviewing the laws and regulations regarding the possibilities of IPD's implementation the same will be done with D&B and the methods will be compared to see which one has less legal barriers for implementation.

Research methodology used in this paper is a literature review of the relevant publications on the topics of integrated and traditional project delivery processes and the Croatian legislation. The review includes scientific papers and an official guide to IPD for the first section, a conference paper by the Authors which is the foundation for further research of this paper and the laws and regulations relevant to the implementation of IPD and D&B for the last section.

The purpose of this paper is, therefore, to find out whether IPD fits the previous research model regarding the number of agent and interdisciplinarity and to discern whether integrated methods of project delivery can be used to integrate solution development and solution implementation phases.

2. Literature review

This review will be comprised of three parts. First part will describe the state of the art in the literature regarding the integrated project delivery (IPD), the second will briefly describe the theory that is the foundation of this paper's contribution and the third will shortly list the Croatian legislation act which might be the barriers to implementing integrated delivery methods.

2.1. Integrated project delivery

The most quoted definition of IPD is probably the one by American Institute of Architects (AIA): "Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction." (AIA, 2007).
The AIA goes further to elaborate its definition: "IPD leverages early contributions of knowledge and expertise through utilization of new technologies, allowing all team members to better realize their highest potentials while expanding the value they provide throughout the project lifecycle. ... Building upon early contributions of individual expertise, these teams are guided by principles of trust, transparent processes, effective collaboration,