

The advantages of Integrated Project Delivery (IPD) utilization in the construction industry compared to Traditional Project Delivery methods

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ABSTRACT

Today, primarily due to the development of information technologies, the Architecture Engineering and Construction (AEC) industry has the opportunity to realize its shortcomings more effortlessly. Typically, the most considerable difficulties are encountered in the performance measurements of projects in the AEC industry. The reason is that the AEC industry is highly fragmented, even though it involves various stakeholders that should be in uninterrupted communication throughout all phases of a project. This fragmented structure mainly causes (1) endless debates among the stakeholders, (2) schedule delays, and (3) profit losses. Hence, addressing projects' productivity change regarding the utilization of different project delivery methods attracts great attention from scientific communities in particular. Nowadays, it has been comprehended that one of the most substantial metrics for project productivity is the project delivery method used. In this sense, the biggest concern related to the usage of traditional project delivery methods is that they cause time, effort, and money losses due to their weaknesses. To that end, the necessity of the Integrated Project Delivery (IPD) concept emerges based on its benefit over the project collaboration and the potential to overcome the deficiencies of the traditional methods. This paper will discuss the vitalism of the IPD concept in the AEC industry in detail through a comprehensive literature review and comparison with traditional project delivery methods. Accordingly, it aims to highlight the need for the IPD in the AEC sector by discussing the value-added nature.

INTRODUCTION

Constructions projects consist of complex and fragmented work packages that require several stakeholders to collaborate for shared goals. Conventionally, in project execution in the AEC industry, various options of project delivery methods such as; design-bid-build, design-build, and construction manager at risk, are emerged to regulate this fragmented structure. Perlberg, B. (2009) stresses on this nature by mentioning that the AEC industry is getting extremely fragmented, wasteful and individualistic as the time passes because each team focuses on their work packages and trying to maximize their profits only. Hence, project performance drops have occurred in the AEC industry. The AIA California Council (2007) indicates that the AEC industry has attracted all the attention since it is the only industry that has remarkably declined in its performance. In contrast, other sectors have achieved a considerable amount of growth in their performance in that same period since 1964. Accordingly, in time, the importance of the project delivery method used for the overall performance of the project is understood. Over time, traditional project delivery methods have been insufficient in solving sector-specific problems, and project performances have become more sensitive than ever to the collaboration rate of project participants. Consequently, it is understood that to reduce the profit and time losses, and to ensure performance stability, the AEC industry should incorporate innovative and modern approaches related to the project delivery model. Thus, both the researchers and the practitioners started to seek for new strategies aiming (1) to

INTRODUCTION (CONT'D)

understand the drawbacks of traditional delivery methods in each of a project's lifecycle components (Figure 1), and (2) to find remedial solutions.

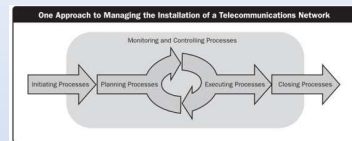


Figure 1. Active Components of a Project Lifecycle (Project Management Institute, 2010)

Ultimately, as a new approach, IPD is suggested, which consists of innovative solutions to enhance project success by scrutinizing the waste, unproductiveness, and confrontational relations in the AEC industry (Autodesk 2008). The aim of this paper is, therefore (1) to reveal that the IPD enhances the project performance through its advantages such as developing continuous communication and collaboration, and (2) to promote risk/reward sharing, and determination of shared goals among project participants, compared to the traditional project delivery methods. In the rest of the paper: (1) project delivery methods will be introduced, (2) IPD will be compared with traditional delivery methods, and (3) the conclusion will be drawn regarding the results of the comparison.

PROJECT DELIVERY METHODS

• Project Delivery Method

Associated General Contractors of America (AGC) defines a project delivery method as "the comprehensive process of assigning the contractual responsibilities for designing and constructing a project". To reveal the advantages of IPD, it is necessary to touch on the three critical points mentioned in this definition. These points are;

- > The complexity of project management
- > Contractual responsibilities in a project (Figure 2)
- > The project phases, design and construction

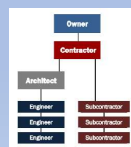


Figure 2. Typical Project Participants in a Construction Project (The American Institute of Architects AIA, 2013)

In the book profit, risk and leadership, Tom Porter states that the most common types of project delivery methods are Design-Bid-Build (DBB), Construction Management at Risk (CMAR), and (Design-Build) (DB) in the construction industry.

PROJECT DELIVERY METHODS (CONT'D)

• Design-Bid-Build (DBB)

- ⊙ Lowest bidding cost
- ⊙ Procurement details are well defined
- ⊙ The most linear breakdown structure (Longest process duration)
- ⊙ Two contracts (Architect & Contractor)
- ⊙ The contractor cannot be active on the processes - Various claims
- ⊙ Owner at high risk (Total cost variation)

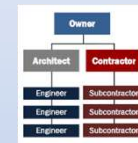


Figure 3. Design-Bid-Build (DBB) Organizational Scheme (The American Institute of Architects AIA, 2013)

• Construction Management at Risk (CMAR)

- ⊙ CM is hired considering the qualification (since owner risk shared)
- ⊙ Procurement details are transparent during the project execution
- ⊙ CM joins the project at early phases
- ⊙ Less rework need & Expedition of project
- ⊙ Failure in CM selection – Catastrophe

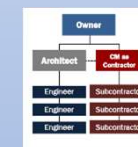


Figure 4. Construction Management at Risk (CMAR) Organizational Scheme (The American Institute of Architects AIA, 2013)

• Design-Build (DB)

- ⊙ Fastest (single contract) & most cost-effective type
- ⊙ Contractor – Owner's representative (Improved management)
- ⊙ Prone to confronted with CM issues (Responsibility – Contractor)

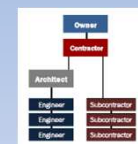


Figure 5. Design-Build (DB) Organizational Scheme (The American Institute of Architects AIA, 2013)

PROJECT DELIVERY METHODS (CONT'D)

• Integrated Project Delivery (IPD)

- ⊙ Architect / Contractor – one entity
- ⊙ Encouraged commitment to collaboration & communication among parties (Early-phase integration)
- ⊙ The linear flow of hierarchy
- ⊙ Not working in silos X multi-party attendance, a collective mindset
- ⊙ Eliminated rework (waste), reduced project duration & cost

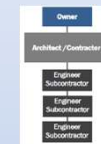


Figure 6. Integrated Project Delivery (IPD) Organizational Scheme (The American Institute of Architects AIA, 2013)

DISCUSSION & CONCLUSION

The AEC industry's major problem is the lack of cooperation due to the fragmented structure and the endless discussions among the project stakeholders. Mohd Nawi et al. (2014) concluded that this fragmentation mainly emerges from two reasons; (1) the discrete design and construction phase, and (2) the lack of collaboration among parties. Egan (2002) argued that process and team integration are key drivers for such a change that cause an increase in project performance. In this direction, integrated project delivery (IPD) has emerged to meet an urgent need. Compared to the traditional project delivery methods, IPD has proved its abilities in ensuring (1) enhanced collaboration among project stakeholders, (2) determination of common goals, (3) risk and reward sharing, and (4) reduction in project duration and cost. Consequently, in this paper, the necessity of IPD integration in the AEC industry regarding its impressive benefits over the project performance compared to the traditional project delivery methods is articulated.

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