An Analysis of Collaborative versus Competitive Non-Collaborative Project Delivery Methods

Construction projects can be completed under numerous contractual formats between the owner and the design and construction service providers. Two of the most commonly applied methods on public and private projects are construction management at risk (CMR) and design-bid-build (DBB). This paper identifies research papers, reports and studies previously undertaken to compare delivery methods and summarizes their results.

To achieve the best possible project outcome, it is important to examine past project results realized using different delivery methods. According to data from the Construction Industry Institute (CII) and the American Society of Civil Engineers (ASCE), and from independent research conducted at Pennsylvania State University, Iowa State University, the University of North Carolina, the State of Washington and others, projects delivered using CMR outperformed DBB in terms of:

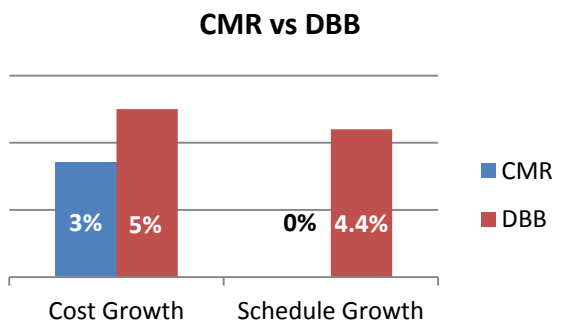
- Cost and schedule performance
- Design and construction speed or intensity
- Quality of end product

"Comparison of U.S. Project Delivery Systems," a study by the CII with Pennsylvania State University

This study compares CMR, DBB and Design/Build (DB). The 1998 paper set the stage for identifying the benefits of a more collaborative process of project delivery in terms of performance across the following metrics:

- Cost performance
- Schedule performance
- Quality outcomes

By studying over 350 projects of varying size, market segment, complexity and location, the study found that CMR projects outperformed their DBB counterparts in terms of cost growth, with nearly five percent of DBB projects experiencing cost creep compared to 3.4 percent of CMR projects. Schedule performance was significantly better for CMR projects as well. Over 50 percent of those delivered by CMR had zero schedule growth, while over 50 percent of the projects delivered by DBB had a 4.4 percent schedule growth.



"Measuring the Impacts of the Delivery System on Project Performance: Design-Build and Design-Bid-Build," a study by the CII with the National Institute for Standards and Technology

This study analyzed DB and DBB projects submitted by owners and contractors. Owner-submitted DB projects outperformed DBB projects in cost, schedule, changes, rework and practice use. However, statistically significant differences were only found for schedule, changes, rework and practice use. Contractor-submitted DB projects outperformed DBB projects in changes, rework and best practices, including constructability, team building, zero accident technique and design/information technology use. There was a statistically significant difference for change performance only. Contractor-submitted DBB projects outperformed DB projects regarding schedule, however there was not a significant difference in project schedule growth.

"Cost Comparison of Collaborative and IDP-Like Project Delivery Methods versus Competitive Non-Collaborative Project Delivery Methods," a study for the 20th Annual Conference of the International Group for Lean Construction

This study set out to validate the belief that highly collaborative project delivery methods contribute to faster completion, lower project costs and higher quality. Due to a lack of data on true Integrated Project Delivery (IPD) projects, the study compared CMR projects where the CMR is identified as collaborative with those delivered by competitive sealed proposals (CSP).

The study found that among the 17 CMR and 13 CSP projects delivered to the same owner "The overall cost performance is more reliable for CMR than for CSP projects," and "The cost of reducible change orders for errors, omissions and design modification is lower for CMR than CSP projects."

The study also identified value-added advantages to CMR over CSP, including: qualification-based contractor selection, input of contractor into design for budget and planning assistance, continuous budget control, screening of subcontractors, faster schedule and fast track construction opportunities.

"Construction Manager/General Contractor Issue Identification," a study by the Minnesota Department of Transportation Office of Policy Analysis Research and Innovation

This 2012 study was requested to assist the Minnesota Department of Transportation (MnDOT) in obtaining enabling legislation and implementing the CMR project

delivery method on its projects. The study identifies various methods of project delivery, including CMR and DBB.

The study found that the main rationale for owners selecting the CMR delivery method included "enhanced constructability, real-time construction pricing capability, and speed of implementation." Further, unlike DBB, CMR brings the builder into the design process at a point where definitive input can have a positive impact on the project.

"Construction Management at Risk within The University of North Carolina," by The University of North Carolina

In this paper, the university set out to explain its process and rationale for utilizing the CMR delivery method. It found that the CMR process added value by providing construction input into design to validate estimates, provide constructability analysis and recommendations, and establish common goals for project schedules. Additionally, it found CMR reduced the adversarial nature of relationships between the owner, designer and contractor. Finally, the university appreciated the ability to select a contractor based on qualifications and also had higher minority participation on projects.

"An Assessment of General Contractor/ Construction Manager Procedures" by the State of Washington Joint Legislative Audit and Review Committee

This brief 2005 report examined the results of CMR (called GC/CM in the document) versus those of DBB projects in the state of Washington over a period of 10 years. In evaluating the CMR projects' performance, the state found that CMR: 1) was most successfully used on highly complex projects; 2) stayed closer to projected schedules; 3) stayed within an acceptable budget range; and 4) facilitated a team-oriented relationship between the owner, CMR and designer thereby reducing the number of change orders.

Conclusion: Although no one project delivery method will suit the needs of all projects and owners, the overwhelming result of multiple research efforts indicates that CMR projects outperform their DBB counterparts in terms of cost, schedule, quality and overall project experience.

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