



Construction Industry Institute®

Starting from Scratch: A New Project Delivery Paradigm

Construction Industry Institute

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**Prepared by
Construction Industry Institute
Innovative Project Delivery Processes – Is There A Better Way?
Research Team**

**Research Summary 271-1
July 2011**

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The University of Texas at Austin

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Printed in the United States of America.

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Executive Summary

Research Team (RT) 271 was established by the Construction Industry Institute (CII) to answer the following question: If the capital project industry did not exist and a new need were created for it, what would it look like? The capital project industry could be different in many ways, including the following:

- Owners could do all, some, or none of the work.
- Contractors could make different offers, as Rolls Royce did when it changed from selling jet engines to selling flight hours.
- The underlying technology could change; for example, constructed assets could be “printed” rather than assembled from parts and pieces.
- The sequence in which players are brought onto projects could change, as when process equipment suppliers are selected at the beginning of projects. (See the work of CII Research Team 130 to change the EPC process to bring suppliers of strategic procurement items and/or systems into an expanded circle of cooperation between owner and contractor.)
- The industry could change its fundamental business practices and culture, and escape from its seemingly eternally swinging “I beat you up – You beat me up” pendulum.

All of these possibilities (and others) are well worth considering. RT 271 chose to focus on culture and process—on the way project delivery systems are designed and managed. Taking this approach, the team found that 1) projects perform better the more they institute an ideal delivery system, and 2) the impact on performance increases with the dynamic character of the projects being designed and managed. The team’s ultimate conclusion was that complex, uncertain, and quickly built projects perform better when designed and managed in accordance with alignment of interests, organizational integration, and management-by-means (lean) methods.

Projects that differ in their certainty, complexity, and speed also differ in the ways they are best procured, structured, and managed. Slow, simple, and certain projects can be procured through buying products, structured as a sequential process, and managed by an exclusive focus on outcomes. In contrast, dynamic projects are best procured by engaging a team, best structured as an integrated organization, and best managed opportunistically. Project leaders on these types of projects must always be alert to risks and opportunities, creating and recreating the conditions for project success (managing by means).

If this ideal is realized, the capital projects industry will become a leader rather than a laggard in innovation and productivity. Moreover, working on projects will be psychologically and materially more rewarding to industry participants. Industry leaders and CII are urged to provide the leadership needed for realizing this ideal.

Introduction

Research Team (RT) 271 was chartered to rethink the capital project delivery system from a blank sheet of paper. The team decided to focus its efforts on culture and process—recognizing that industry structure, technology, and business models also offer opportunities for radical transformation—anxious to do something well rather than risk casting a broader net and failing to produce anything of value.

The objectives of this research are as follows:

1. Identify an innovative approach to capital project delivery that can be applied and adapted to the context of individual projects, in order to achieve the best outcomes.
2. Challenge the industry and its customers to create the conditions under which the ideal project delivery system can be realized.
3. Provide suggestions on how to approximate the ideal project delivery system within constraints that have not yet been removed.

The team formulated an ideal project delivery system—called “ideal” because it applies across the entire range of projects, from slow, simple, and certain to uncertain, complex, and quick.

Projects can be located on a continuum between certain, simple, and slow on one side and uncertain, complex, and quick on the other. The following example illustrates this continuum. Two ships, X and Y, are *en route* to their respective destinations. Ship X is in calm waters throughout and has a fixed destination from the outset. Ship Y is in stormy seas with an indefinite and shifting destination. Management’s job on Ship X is to make sure the course is set accurately for its destination and to make sure it stays on course and on schedule. Ship Y’s management faces different challenges. The location of its destination is known only approximately, and winds and waves keep pushing the ship off course and off schedule. Captain and crew must work continually to get a fix on

the destination, and to re-plot a course to avoid the most turbulent seas. On Ship X, because compliance is what matters most, management concentrates its effort and attention on staying the course. On Ship Y, learning, innovation, and resilience are the order of the day.

On simple, certain, and slow projects, the following conditions apply:

- A high degree of pre-programming is possible; the future can be (more) accurately predicted.
- Innovation is neither needed nor wanted. There is no need for money to move across contractual or organizational boundaries in search of the best investment opportunities. The project imperative is “Just do what is in your contract.”
- Crew members can be adequately motivated by threats of financial reward and punishment (i.e., by extrinsic motivators).

Conversely, on complex, uncertain, and quick projects, the following conditions apply:

- Pre-programming is limited, and it is essential to proactively steer the course of execution.
- Innovation is necessary for project success. Money must be able to move across contractual boundaries to find the best return on project investment.
- Alignment of the contract parties’ commercial interests allows them to release their employees to pursue intrinsic motivators, such as purpose, mastery, and autonomy (Pink 2009).

RT 271 Hypothesis

Given that most projects lie somewhere on the continuum between simple, certain, and slow on one side, and complex, uncertain, and quick on the other, RT 271 offers the following hypothesis:

Complex, uncertain, and quick projects perform better when designed and managed in accordance with alignment of interests, organizational integration, and management-by-means (lean) methods.

The team bases this hypothesis on the following evidence and considerations:

- Anecdotal data suggest that projects have been becoming more uncertain, complex, and quick for a number of years, but project management education and bodies of knowledge are still based on the model of slow, simple, and certain projects.
- What percentage of projects really are slow, simple, and certain? In determining whether owners and contractors view the acquisition of a project as the purchase of a product or as the effort of a problem-solving team, CII Task Force 84 found extensive uncertainty regarding both project ends and means well into construction.
- The delivery system for slow, simple, and certain projects is inadequate for dynamic projects. However, the reverse is true. The implication is that the ideal or template for project delivery should be based on uncertain, complex, and quick projects.

The team tested its hypothesis in the following ways:

- The characteristics of an ideal project delivery system were brainstormed and formulated.
- The literature was explored, with particular focus on previous CII publications, for anticipation and support of the ideal.
- The ideal was tested using statistical analysis and case studies.
- A proposal was developed, with a call for industry leaders and CII to create the conditions under which the ideal can be realized.

The Ideal Project Delivery System

The research team developed a vision for future-state project delivery systems, identified their components, and developed a solution that could be tested. The team began its exploration with a visioning process to formulate the ideal project delivery system. The product of this process is the outline presented in Figure 1.

The major components of the outline and their key subcomponents are the following:

- Delivers to customers what they need to achieve their objectives, within their conditions of satisfaction. (Note: this is a version of the lean ideal.)
 - predictable outcomes
 - defect-free execution
 - retention of positive competition.
- relational environment
 - Everyone feels valued.
 - Relationships survive the project.
- management system
 - holistic optimization; optimization of the whole, not the parts
- collaborative financial management
 - financial transparency
 - alignment on compensation
- promotion of learning
 - Individuals are enabled to develop their capabilities, to become all they can be.
 - Learning from each project is carried forward to future projects.

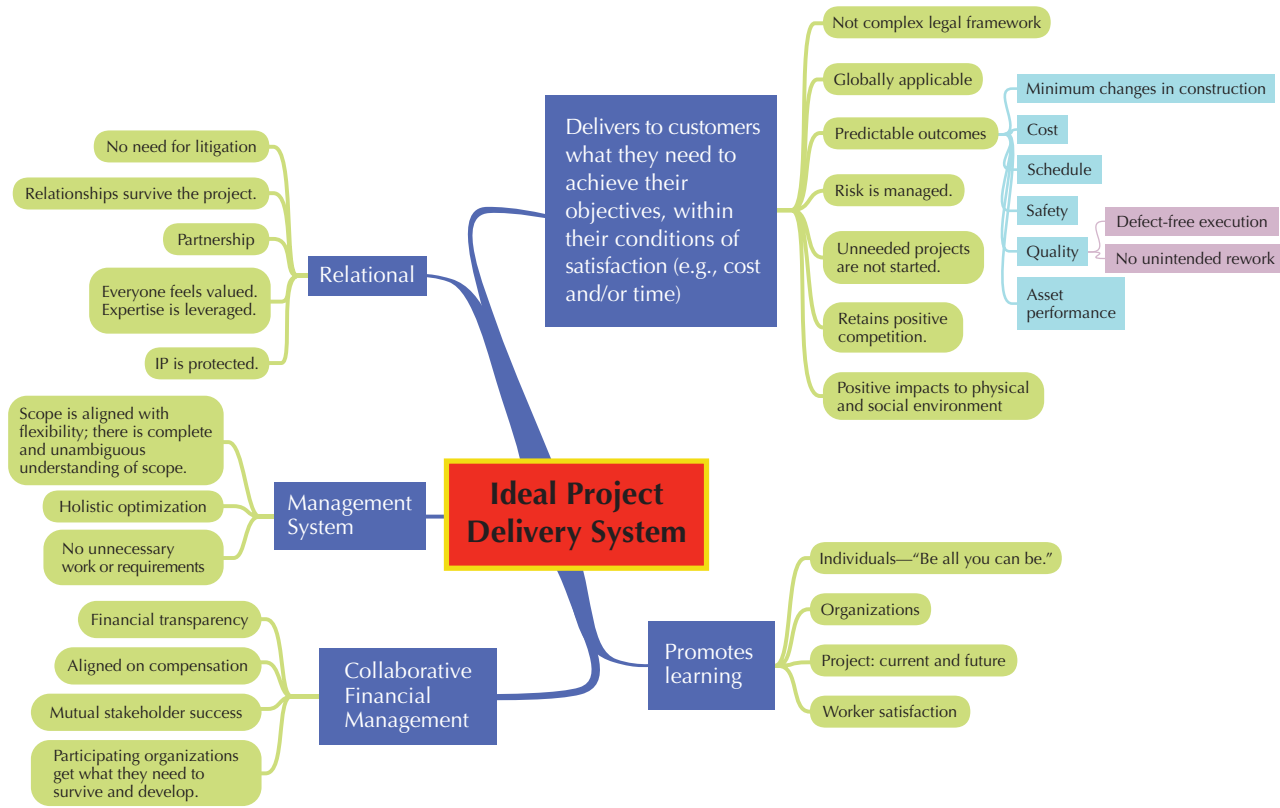


Figure 1. Ideal project delivery system