Maximizing Success on Integrated Projects: An Owner’s Guide

An Overview of the Research and Owner’s Guide
Maximizing Success on Integrated Projects: An Owner’s Guide

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Research Motivation

To improve owner delivery decisions by providing practical guidance based upon empirical evidence

1998 CII/Penn State Study of 351 projects

<table>
<thead>
<tr>
<th>Metric</th>
<th>D-B vs. D-B-B</th>
<th>D-B vs. CM@R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Cost</td>
<td>6.1% lower</td>
<td>4.5% lower</td>
</tr>
<tr>
<td>Construction Speed</td>
<td>12.0% faster</td>
<td>7.0% faster</td>
</tr>
<tr>
<td>Delivery Speed</td>
<td>33.5% faster</td>
<td>23.5% faster</td>
</tr>
<tr>
<td>Cost Growth</td>
<td>5.2% less</td>
<td>12.6% less</td>
</tr>
<tr>
<td>Schedule Growth</td>
<td>11.4% less</td>
<td>2.2% less</td>
</tr>
</tbody>
</table>
# Research Motivation

To improve owner delivery decisions by providing practical guidance based upon empirical evidence

<table>
<thead>
<tr>
<th>1998 CII RT 133</th>
<th>2015 CPF-CII</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
<td>How does the level of integration impact project delivery success?</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Delivery, procurement, contracting, behaviors and environment</td>
</tr>
<tr>
<td><strong>Findings</strong></td>
<td>✗ DB was faster than DBB and CMR</td>
</tr>
<tr>
<td></td>
<td>✓ Cost and schedule growth were highest for DBB</td>
</tr>
<tr>
<td></td>
<td>✗ Combined contracts were faster than split contracts</td>
</tr>
<tr>
<td></td>
<td>✓ Cost and quality were driven by procurement and contracting</td>
</tr>
</tbody>
</table>
Summary of Findings

Best performing delivery strategies maximize

1. Early involvement of the core team
2. Qualification-based team selection
3. Transparency in cost accounting
Project Data Characteristics

Facility Sizes

- (4%) 8 > 700,000 ft²
- (3%) 7 600,000 - 699,000 ft²
- (2%) 3 500,000 - 599,000 ft²
- (3%) 6 400,000 - 499,000 ft²
- (7%) 15 300,000 - 399,000 ft²
- (13%) 26 200,000 - 299,000 ft²
- (24%) 49 100,000 - 199,000 ft²
- (44%) 90 0 - 99,000 ft²

204 Projects

- Public: 127 (62%)
- Private: 77 (38%)

Completed: 2008 - 2013

Facility Types

- Educational 56 (27%)
- Office 41 (20%)
- Health Care 32 (16%)
- Lodging 27 (13%)
- Commercial 20 (10%)
- Sports & Recreation 11 (5%)
- Manufacturing 11 (5%)
- Correctional 4 (2%)
- Transportation 2 (1%)
Goal: Determine if team processes and behaviors have an impact on project performance
Team Integration

Cohesiveness

Degree to which team members from separate organizations and disciplines are engaged in collaborative activities

- Participation in
  - Joint Goal Setting
  - Cross Disciplinary design charrettes
  - BIM Execution Planning
- Increased sharing of information and analysis through BIM
- Increased team interaction through colocation

Higher levels of integration led to:
- Reduced *schedule growth*
- Enabled *more intense schedules*
- Led to *more cohesive teams*
Group Cohesion

*Degree to which team, as individuals, have shared, task commitment, group pride, and interpersonal alignment*

- Commitment to shared goals
- High levels of team chemistry
- Communication is timely and effective

Higher group cohesiveness led to:
- Reduced *cost growth*
- Higher *system quality*
- Improved *turnover experience*
Factor Value

Group Cohesion

Team Integration
70% of projects delivered late had below average levels of Team Integration.
60% of on budget projects had above average levels of *Group Cohesion*.
Deliver Method

Group Cohesion

Team Integration

DB
We need to consider more than just delivery method

Large variance within each delivery method
Delivery Strategy

Group Cohesion vs. Team Integration

I, II, III, IV, V
Best performing delivery strategies maximize

1. Early involvement of the core team
2. Qualification-based team selection
3. Transparency in cost accounting

The Owner’s Guide
Pulling it all together

- Reduced **cost growth**
- Improved **turnover experience**
- Higher **system quality**

Team Integration

- Reduced **schedule growth**
- Enabled more **intense schedules**
- Led to more **group cohesion**
1. Define Project Needs
   - Assess goals for management and performance
     1a. Document project summary information (e.g., size, type, etc.)
     1b. Determine project goals (e.g., time, cost, quality, etc.)

2. Explore Delivery Options
   - Discuss delivery decisions with attention to integrated processes and team cohesion
     2a-b. Discuss organizational structure (single vs. split D&C contracts, timing of core team involvement)
     2c. Discuss contract payment terms for builder and key trades (open vs. closed book)
     2d-g. Discuss team assembly (e.g., selection process and criteria, prior experience, etc.)

3. Select Delivery Strategy
   - Identify an optimal delivery strategy consistent with owner constraints
     3a. Identify owner’s legal and policy constraints (e.g., procurement law, staff experience, etc.)
     3b. Determine strategy by comparing to research results (e.g., Classes I-V)
     3c. Select and Implement Project Delivery Strategy

Owner’s Project Delivery Strategy
- Project summary
- Project goals
- Etc.
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