Smart Project Delivery

Lean Decisions

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“Real control is making things happen – Being predictable”
This or that?

- Speed or reliable
- Reliable or speed
Path Forward

- N.P.D.S. Study
- Selecting project delivery systems
- Lean decision making
- Case in point
PSU-CII Study

- National comparison of critical systems
- 351 U.S. general building projects
- 1990-1997
- Multiple project and owner types
- Heated debate!
PSU-CII Study

• Evolution/ definitions
• Metrics - $, T, Q and environment
• Methodology
Project Delivery System

decisions made
‘Defines the relationships, roles, and responsibilities of parties and the sequence of activities required to provide a facility.’
Research Findings

Design-build vs. Design-bid-build

- 6% lower unit cost
- 12% faster construction speed
- 33% faster delivery speed
Research Findings

Design-build vs. CM at Risk

- 4.5% lower unit cost
- 7% faster construction speed
- 23% faster delivery speed
Research Findings – Quality

- Owner expectations
- General requirements

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Best in Class by Metric

- Top quartile projects: Cost

  95% - Excellent/adequate decision making
  90% - Excellent/adequate scope definition
  87% - Excellent team communication
  85% - Qualified contractor pool
  71% - High ability to restrain contractor pool
Flip Side!

- Bottom quartile projects: Cost

  73%  - Engaged constructor late (> 20%)
  76%  - Limited or no prior team experience
  69%  - Several onerous contract clauses
  65%  - Poor ability to make decisions
  62%  - Did not prequalify bidders
Key Research Questions

- Are systems that implement a team approach mechanisms that inherently lead to success?
- How does an owner select a project delivery system?
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Seven Steps to Success

1. Define facility business goals
2. Determine owner’s profile
3. Select project delivery system
4. Select procurement
5. Select project team
6. Select contract type
7. Confirm program
1 Define Facility Business Goals

- Establish target values for each goal
- Review pro-forma, interview owner etc
- Review statements and rank importance
Facility Business Goals

- Unit Cost ($/ft^2)
- Construction Speed (ft^2/month)
- Delivery Speed (ft^2/month)
- Cost Growth (%)
Facility Business Goals (2)

- Schedule Growth (%)
- Turnover Quality (0-10)
- System Quality (0-10)
- Process Equipment Quality (0-10)

Time-out!
2 Determine the Facility Owner’s Profile

- Establish profile for owner, job, environment
- Answer 5-10 questions regarding each factor
- Rank importance of each factor collectively (L, M, H)
Facility Owner’s Profile

- Project profile
- Facility owner experience and culture
- Scope definition/ change potential
- Decision making ability
- Risk management
• Organizational constraints
• Procurement culture
• Owner involvement
• Pool of qualified contractors
3 Select Project Delivery System

Delivery system order

Design-Build
Construction Management at Risk
Design-Bid-Build
Hybrids -

Because specific owner, organizational and project environmental constraints demand modifications to the system.
4 Select Procurement Method

- Not all procurement methods are suited to each project delivery system.
- Procurement method should be compatible with project goals.
Procurement Methods

- Open bidding
- Prequalification
- Proposal method
Procurement Methods (2)

- Competitive
  - two step
  - best value
- Negotiated
- Sole source/ direct selection
Consider Owner Profile – step 2 coordination

- Timing (length and team)
- Team vs. adversarial
- Submission and presentation limits
- Evaluation methods
- Evaluation team
5 Select Project Team

- Team members
  - developer
  - architect/engineer
  - contractor
  - specialty subs
  - suppliers/vendors
Project Team Considerations

- Real owner experience
- Experience of staff on project
  - project type
  - delivery type
  - locality
- Company support
- Relationships of team!
Opportunity Model

Partner of Choice

Client Expectations

Price

Time + Price

Quality + Time + Price

Service + Quality + Time + Price

Commodity

Preferred Commodity

Preferred Provider

Differentiation

People

Processes

Stature

Competencies
6 Select Contract Type

- Contract follows procurement and relationships
- Onerous contract clauses
Contract Types

- Cost reimbursable
- Guaranteed maximum price
- Unit rates
- Fixed price
Fees/Incentives

- Promote the desired behavior
- Incentive should match penalty
3, 4, 5, 6...review

- Select project delivery system
- Select procurement method
- Select project team
- Select contract type

...all things being equal...
...not all methods match each system...
...behavior...
...pick and force syndrome...
7 Develop/ Confirm the Program

- Scope definition
- Feasibility check
- Probability of change
- Scope control program
Path Forward

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Lean Decisions?

Are the delivery system, project team, procurement method and contract type and the owner’s project goals and culture aligned?

Success Factors
Suggested Practices
Owner Challenges
Achieve Success Factors

- By project delivery system
  - e.g. design-build
- By metric
  - e.g. cost growth
Design-Build Success Factors

- Engage construction team early (<20% design)
- Excellent subcontractor experience - facility type
- Excellent subcontractor experience - design build
- Excellent contractor experience - facility type
- Excellent project team communication

How do I achieve success factors?
Suggested Practices

- Techniques from several hundred facility owners
  - Restrain contractor pool
  - Pre-qualify project team
  - Foster team communication/relationships
  - Minimize legal constraints
  - Engage team early
  - Make timely decisions
  - Ensure team has relevant experience
What is my role?
Coordinate Challenges

- Work scope
- Scope change
- Procurement
- Project Team
- Risk/ experience
- Client’s Team
- User Involvement
Path Forward

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National Research Council
Case Facts

- Structure (5+11+ph)
- Historic preservation
- Class A office
- City block
- 382,000 sf
- 35% LSDBE
- Phase 2
Step 1 – business goals

- System Quality
  - Interior space and layout
  - Environment
  - Envelope, roof, structure, foundation
- T – delivery speed
- $ - cost growth (certainty)
Step 2 – owner profile

- Facility owner experience: Low
- Scope/Change potential: High
- Decision making ability: Low
- Organizational constraints: Low
- Procurement culture: High
- Owner involvement: Medium
Step 3 – select pds

- Quality
  1. DB and CMR
  2. Nearly equal
  3. DB and CMR

- Delivery Speed – DB and CMR

- Cost Growth – DB and DBB
Step 4 – select procurement

- Facility owner experience
  - Ensure staff or seek professional partners
- Scope definition/change potential
  - Consider qualification element
- Procurement culture
  - Ability to integrate with the owner’s culture
Step 5 – select team

- Pre-qualify
- Qualification factors –
  - Commitment of staff
  - Relevant experience
  - Ability to meet LSDBE
  - Performance of team players
Step 6 – select contract

- Poorly defined scope = cost reimbursable
- Risk allocation = GMP
- Team service to provide a facility = fee
Step 7 – confirm program

- 1990
- ‘Wish List’
  1. Parking counts – 450
  2. Conference rooms
  3. Receiving areas
  4. Office counts
  5. Four-pipe mechanical system
  6. Art in architecture
Outcome for NRC!

- Procurement
- Delivery system
- Team
- Contract
- Program
Procurement

- 10% RFQ/RFP issued – 10/1/98
- Quality 1st, Time 2nd, Money 3rd
- Limited to 3-4 proposals
- Qualifications reviewed
- Mgmt plan reviewed
- Team presentations – 11/10/98
- Project Award – 11/13/98
Evolution of NRC Delivery

CM at Risk

NRC

Centex

KCF/SHG
NRC Project Delivery Structure

Design-Build

NRC

Centex/SHG, LLC

NRC team

CENTEX CONSTRUCTION COMPANY
Outcome for NRC!

- Procurement
- Delivery system
- Team – Mech, Elec, Conc, S&S
- Contract – iGMP, fGMP
- Program –
Processes to Date

- No defined scope/program!
- Engaged constructor early
- Design team has evolved
- Making timely decisions
Conclusions

• Lean decisions happen when prepared
• Control of the process is key
• Leader clients
• Experience you have is most important
What can you do today?

• Make lean project delivery decisions
• Collect data and benchmark experiences
• Educate team and company
• Stay current and support research