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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.’

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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

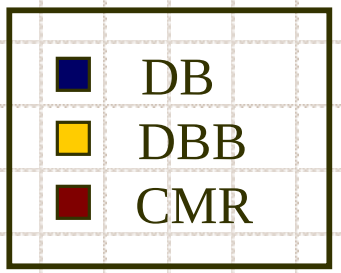
4.5% lower unit cost

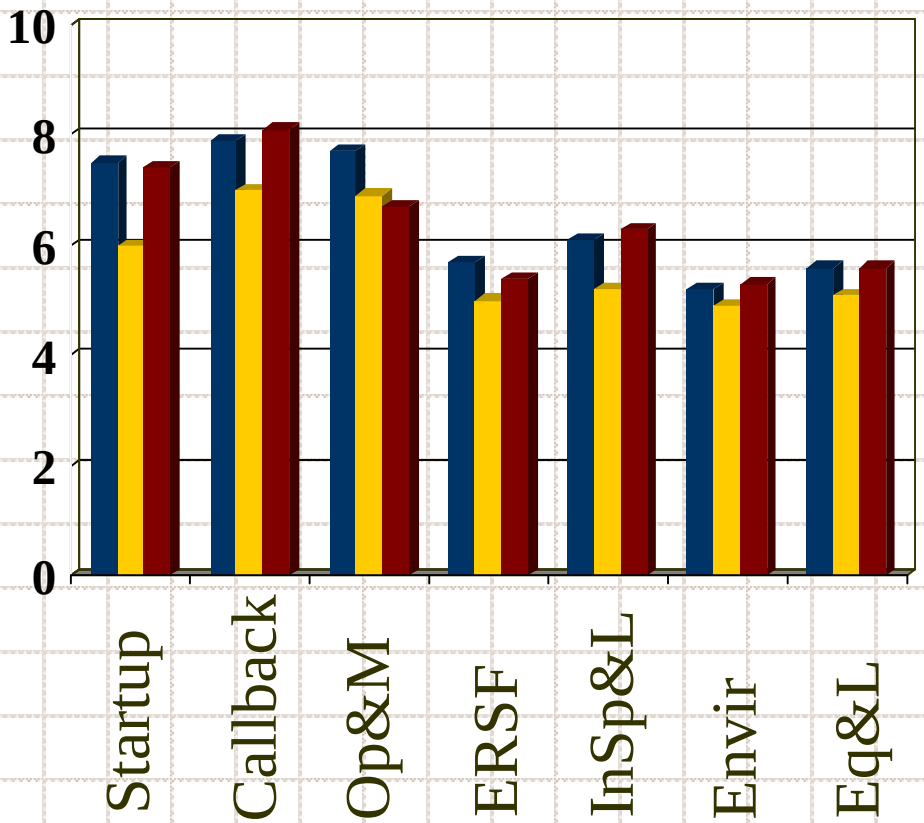
7% faster construction speed

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?

Path Forward

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

Seven Steps to Success

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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

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1 Define Facility Business Goals

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

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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

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

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Facility Owner's Profile

- Project profile
- Facility owner experience and culture
- Scope definition/ change potential
- Decision making ability
- Risk management

Facility Owner's Profile (2)

- 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

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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

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

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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!

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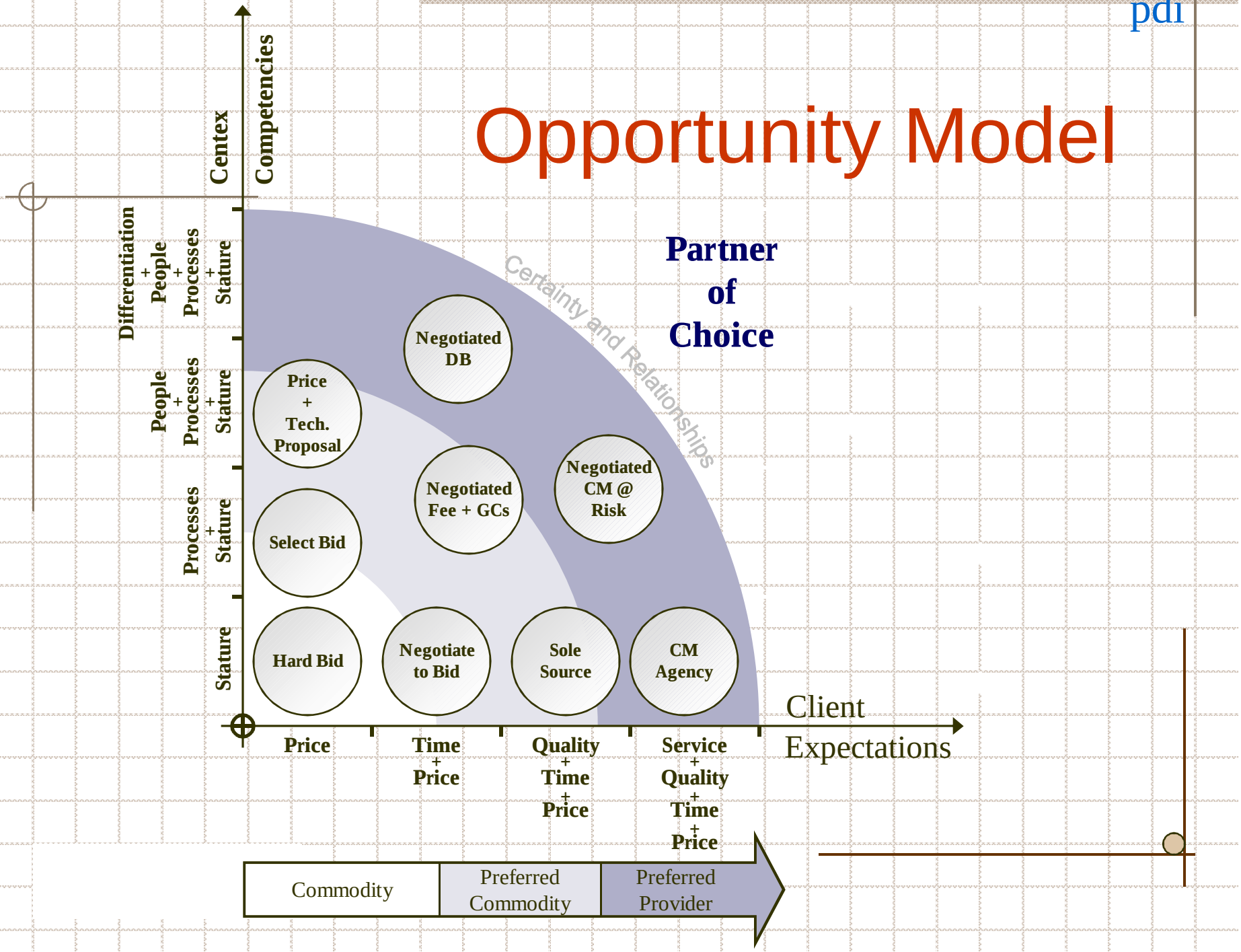
Opportunity Model



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
  - ü all things being equal...
- Select procurement method
  - ü not all methods match each system...
- Select project team
  - ü behavior...
- Select contract type
  - ü pick and force syndrome...

7 Develop/ Confirm the Program

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

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Path Forward

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

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

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Achieve Success Factors

- By project delivery system
  -e.g. design-build
- By metric
  -e.g. cost growth

Design-Build Success Factors

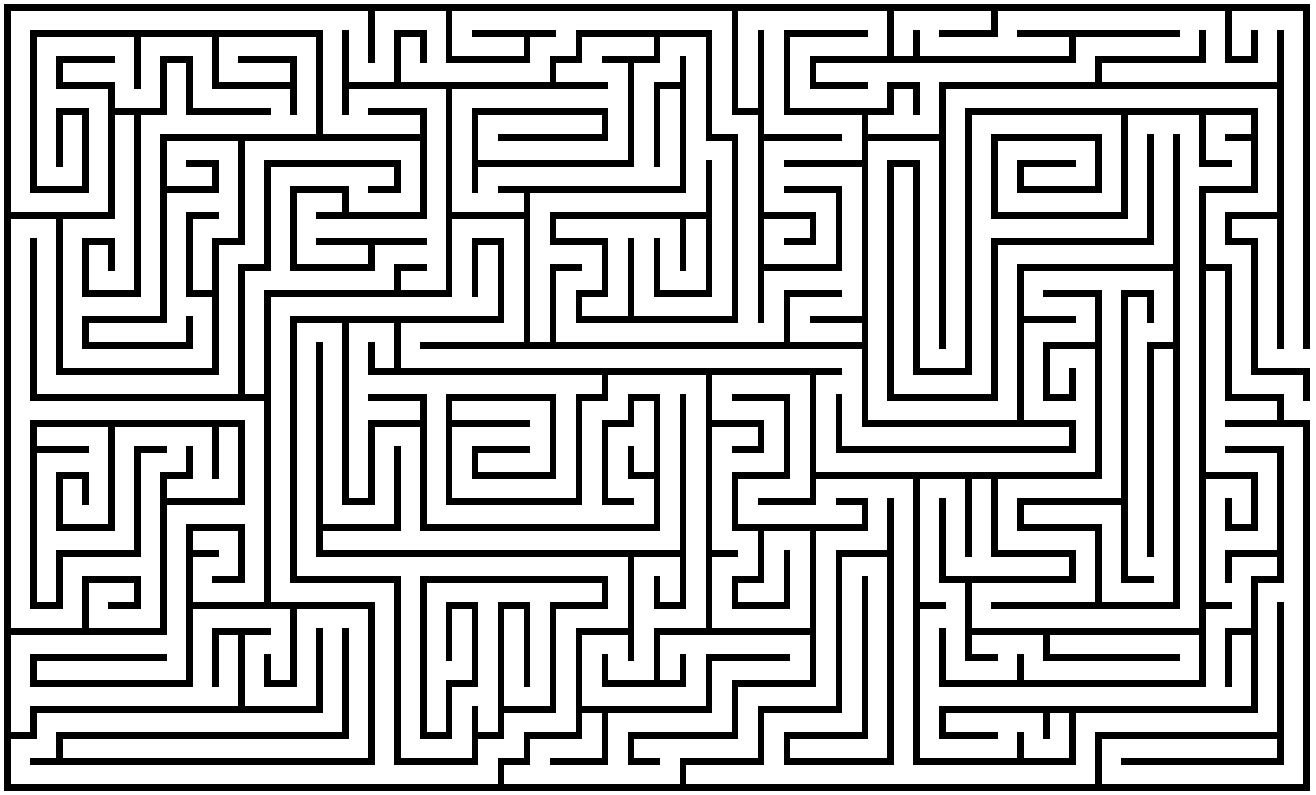
- Engage construction team early (<20% design)
- Excellent subcontractor experience - facility type
- Excellent subcontractor experience - design build
- Excellent contractor experience - facility type
- Excellent project team communication

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?



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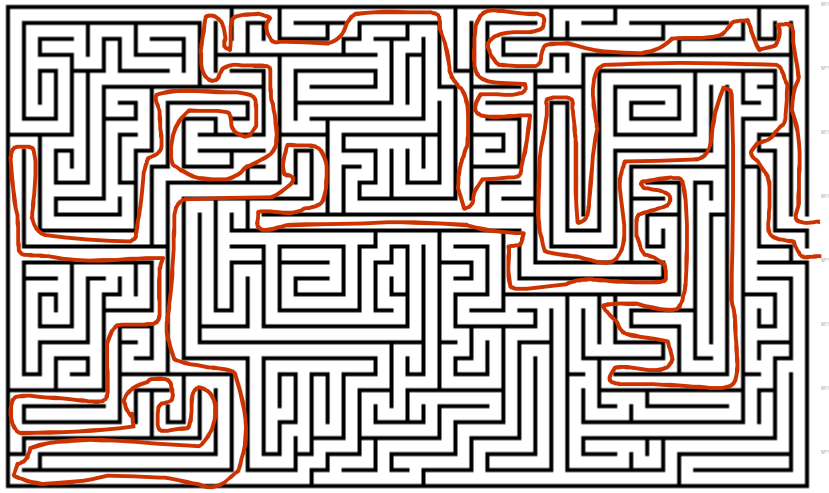
Coordinate Challenges

- Work scope
- Scope change
- Procurement
- Project Team
- Risk/ experience
- Client's Team
- User Involvement



Path Forward

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- **Case in point**

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National Research Council

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Case Facts

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

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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

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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
  - ü Ensure staff or seek professional partners
- Scope definition/change potential
  - ü Consider qualification element
- Procurement culture
  - ü 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

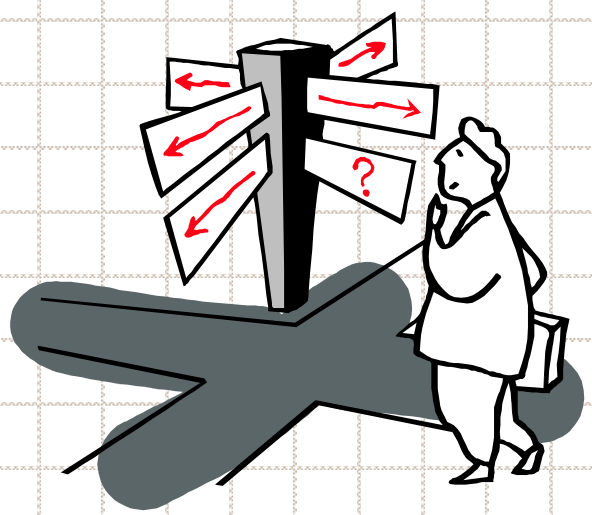
- Poorly defined scope = cost reimbursable
- Risk allocation = GMP
- Team service to provide a facility = fee

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

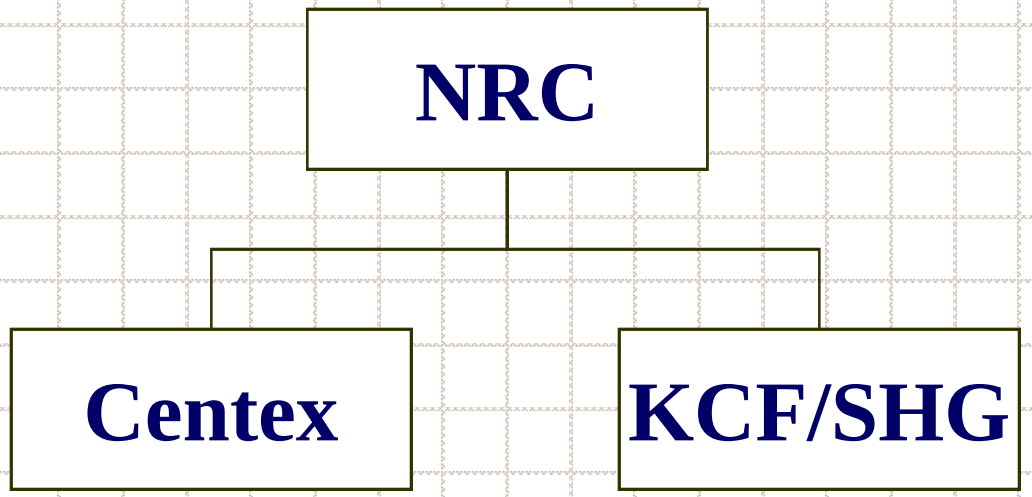


Procurement

- 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



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NRC Project Delivery Structure

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Design-Build

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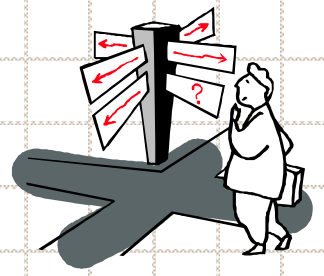
NRC

Centex/SHG, LLC

NRC team

Outcome for NRC!

- ü Procurement
- ü 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

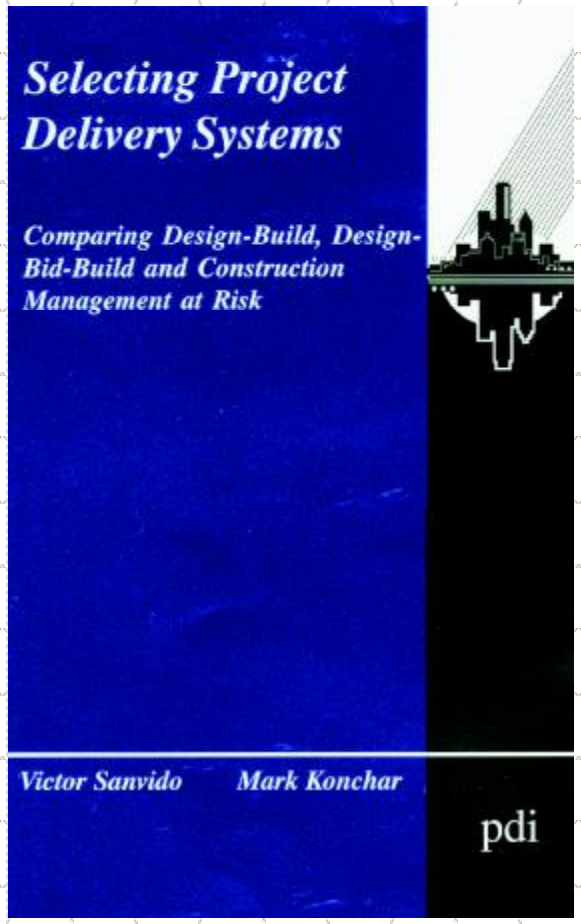
- Lean decisions happen when prepared
- Control of the process is key
- Leader clients
- **Experience you have is most important**

What can you do today?

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

Resource

- Selecting Project Delivery Systems
  - March, 1999



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