THE RICE UNIVERSITY BUILDING INSTITUTE

An Interdisciplinary Collaboration of Industry Leaders
OVERVIEW

AN INTERDISCIPLINARY COLLABORATION OF INDUSTRY, COMMUNITY, AND ACADEMIC LEADERS

OPERATIONAL CENTERS

- Research
  - Define new insights
- Executive Education
  - Improve performance
- Publishing
  - Disseminate latest findings
- Symposia
  - Host interactive exploration
OVERVIEW

RBI BOARD OF DIRECTORS

- Owners
- Architects
- Engineers
- General Contractors
- Real Estate
- Finance

- Project Management
- Government
- Major Subcontractors
- Development
- Law
- Information Technology
CURRENT RESEARCH

ALTERNATIVE PROJECT DELIVERY STRATEGIES FOR HEALTHCARE BUILDINGS
BEFORE WE BEGIN OUR RESEARCH, WHAT DO WE KNOW?

The American Design / Construction Industry

- **Large**
  - 1,250,000 companies
  - 8% of the USA GDP

- **Complex**
  - 93% are fewer than 50 people
  - 44,000 individual code jurisdictions

- **Fragmented**
  - Median life of a subcontractor in the U.S. is 2.8 years
  - Terminal E at IAH: 412 subcontractors

- **Broken**
  - Buildings take too long to design and build
  - They cost too much
  - Usually do not respond to owner’s ever-changing needs
  - Communication errors account for as much as 20% of total project cost
STEP 1  INTERVIEW 102 MAJOR HEALTHCARE SYSTEMS

- What are your critical facility issues?

- What companies or individuals or industry groups do you see as being innovators or thought leaders?
## OVERVIEW

### STEP 2  ASSEMBLE RESEARCH PARTNERS

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<tr>
<th>ASSOCIATIONS</th>
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<td>Marshall Erdman &amp; Associates The Beck Group</td>
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OVERVIEW

STEP 2  ASSEMBLE RESEARCH PARTNERS

ENGINEERS
Arup
Haynes Whaley Associates
Saiful/Bouquet
Smith Seckman Reid
Syska Hennessy
Walter P Moore

HEALTHCARE SYSTEMS
BJC Healthcare
Kaiser Permanente
MD Anderson Cancer Center
Memorial Hermann
Methodist Hospital System
Partners Healthcare
Saint Barnabas Healthcare System
Sutter Health
Texas Children’s Hospital
Department of Defense
Intermountain Health

MANUFACTURING & DISTRIBUTION
Graybar
Herman Miller for Healthcare
Hill-Rom
Johnson Controls
Knoll
Nature by Steelcase
The Ofis
USG Building Systems

INSURANCE & BONDING
Liberty Mutual Surety Group
St. Paul Travelers

HEALTHCARE DEVELOPERS
DASCO
Leggatt McCall Properties

MEDICAL EQUIPMENT MANUFACTURING
GE Healthcare
Phillips Medical Systems
Siemens Medical Solutions
OVERVIEW

STEP 2  ASSEMBLE RESEARCH PARTNERS

PROJECT / PROGRAM MANAGERS & OWNERS REPRESENTATIVES
CBRE
FKP
Hammes Co.
Irvine Team
Jacobs Facilities
Jones Lang LaSalle
KLMK Group
Parsons
Strategic Hospital Resources
Transwestern Commercial Services

SYSTEM INTEGRATION
Lockheed Martin

REAL ESTATE CONSULTING
CBRE
OVERVIEW

STEP 3    DEFINE OUR RESEARCH GOALS

Rethink current project delivery strategies in order to:

- Enhance the owner’s predictability of scope and budget
- Make the system faster, simpler, and less expensive
STEP 4  DEFINE OUR PROCESS

- Define Current Conditions
  - Who’s doing what
- Analyze Appropriateness
  - What’s working and what’s not
- Envision Improvements
  - How we can do it better
- Create a Decision Matrix
  - Describe all major delivery systems and the types of projects for which they are most likely to be successful
PROGRESS REPORT
AFTER 9 MONTHS, WHAT HAVE WE LEARNED?

Generic discussions of project delivery systems are useless

Why?

Our owners function in vastly different worlds:

- Institutional Missions
- Business Models
- Medical Delivery Models
- Patient Populations
- Competitive Environments
- Regulatory Environments
- Capital Constraints
- Real Estate Opportunities & Constraints
AT THIS POINT WE HAVE:

- A Dysfunctional Research Project
  Headed straight for the
- Journal of Irrelevant Outcomes

Even though we have a highly interdisciplinary group of internationally recognized industry leaders:

1. We are not addressing the specific concerns of our owners

2. The owners have no clear way to implement lessons learned
We re-interviewed each owner:

1. What are your most pressing concerns concerning project delivery strategies?

2. What can we do to make this research project more valuable to you?
## OVERVIEW

### RESEARCH PARTNER OWNER GROUP

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<tr>
<th>Kaiser Permanente Healthcare</th>
<th>St. Barnabas Healthcare System</th>
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<td>New York, New York</td>
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This process is about creating healthcare facilities:

Better
Faster
Cheaper

Case studies
Research
Discussion Groups

All learning is worthless if it doesn’t improve the way we build buildings.

1. HOW DO WE KNOW WE’RE BUILDING THE RIGHT BUILDING?

2. HOW DO WE IMPLEMENT WHAT WE LEARN?
TEST 1:  
Does it support our business strategy?  
- Institutional Mission  
- Financial Sustainability  
- Competitive Strategy  
- Teaching  
- Research  
- Community Service

TEST 2:  
Does it support our healthcare delivery system?  
- What medical services are appropriate for our target market?  
- How do we most efficiently provide those services?  
- How do we stay current with the latest trends?
“Our business strategy is in transition”
“Our medical service strategy is in transition”
“Our building project delivery strategy is in transition”

“We are trying to learn how to improve”

- Consultants
- Industry Groups
- Case Studies
- Research Participation

“All of our efforts at learning are useless if we can’t implement better ways to build our buildings.”
BUSINESS STRATEGIES

PRIORITy 1
Build the right building

PRIORITy 2
Build it as efficiently as possible
The consensus of upper management must be that the new facility supports their business strategy and their medical services strategy.

**QUESTION FOR THE RBI**

How can we help our owners achieve this?
QUESTION: IN YOUR COMPANY, WHAT IS THE RELATIONSHIP BETWEEN STRATEGY AND FACILITIES?

We briefly interviewed upper management teams from 40 large academic medical centers:

- CEO’s
- CFO’s
- VP’s of Medical Operations
- VP’s of Strategic Planning
BUSINESS STRATEGIES

SURVEY RESPONDENTS

ARIZONA
University of Arizona Medical Center
St. Joseph’s Hospital

ARKANSAS
University of Arkansas Medical Sciences Medical Center

CALIFORNIA
Beckman Research Institute, California
California Pacific Medical Center
Stanford University Medical Center
University of California Davis Health System
University of California San Francisco Medical Center

COLORADO
University of Colorado Hospital
BUSINESS STRATEGIES

SURVEY RESPONDENTS

CONNECTICUT
Danbury Hospital
Yale University Medical College

GEORGIA
Emory University Hospital

ILLINOIS
University of Chicago Hospitals

MARYLAND
Johns Hopkins University Hospital

MASSACHUSETTS
Boston University Medical Center
Harvard Medical School Hospital

MISSOURI
Ascension Health
SURVEY RESPONDENTS

NEW YORK
Cornell Medical School
Columbia University Medical School
New York Presbyterian Healthcare System

OKLAHOMA
University of Oklahoma Medical Center

NORTH CAROLINA
Duke University Medical Center

SOUTH CAROLINA
Greenville Hospital System
Medical University of South Carolina
University of South Carolina Medical School

TEXAS
Baylor University College of Medicine
BUSINESS STRATEGIES

SURVEY RESPONDENTS

TEXAS
Memorial Hermann Healthcare System
University of Texas Health Science Center
Valley Baptist Health System
University of Texas Medical School, Houston
University of Texas San Antonio Health Science Center
University of Texas Southwestern Medical Center
Parkland Hospital, Dallas / Children’s Hospital, Dallas

UTAH
University of Utah Medical School
Brigham Young University Medical School
Intermountain Healthcare

VIRGINIA
University of Virginia Health System
BUSINESS STRATEGIES

LESSONS LEARNED: BUSINESS STRATEGY COMPONENTS

1. Community Service Mission
2. Financial Sustainability Strategy
3. Medical Delivery Strategy
4. Competitive Strategy
5. Education Strategy
6. Research Strategy
7. Facility Strategy
They all develop strategies – BUT, the most successful and comprehensive strategies had one characteristic in common.
BUSINESS STRATEGIES

LESSONS LEARNED: BUSINESS STRATEGY COMPONENTS

Critical to success:
Integrators who genuinely understand the other two functions.
Effective “integrators” are the single most accurate predictors of strategic success.

EASY TO SPOT
Ask any key player in any function what they are most concerned with. If the Medical Operations people say “healing”, they aren’t integrators. If the facility people say “creating buildings”, they aren’t integrators.

An “Integrator” is primarily concerned with the overall strategic positioning of the venture.
RECAP
We no longer believe in generic approaches to the subject of project delivery systems.
An investigation of project delivery systems only becomes relevant after we have dealt with the question: “Are we building the right building?”
Without an ongoing organizational mechanism that allows us to “Learn, Test, Interpret, and Apply”, all attempts at improvement and innovation will be wasted.
NEW DIRECTIONS

1. OWNER FOCUSED CHARRETTE PROGRAM

2. NEW MANAGEMENT TOOL
   PROCESS ACOUSTICS

3. PERMANENT HEALTHCARE FACILITY COLLEGE
INTERIM REPORT

NATIONAL OPINION SURVEY

Project Delivery Strategies
Healthcare Facilities
SURVEY PARTICIPANTS

1. Owners
2. Project/Program Managers
3. Architects
4. Engineers
5. General Contractors
6. Major Subcontractors
SURVEY ISSUES

1. How new work is acquired
2. Who should manage the process
3. How projects are evaluated
4. Team performance and interaction
5. How does each team member define project success
6. Specific sources of dissatisfaction
7. Prejudicial attitudes about Project Delivery Systems
8. Which systems give you the best chance of delivering:
   - On budget
   - On time
   - Innovative buildings
WHO SHOULD MANAGE THE PROCESS?

How effective are each of the following groups or disciplines at managing the project delivery process?

- Owners' Responses
  - Owner
  - Owner's Rep.
  - Gen. Contractor
  - Architect/Engineer
  - Multiple Leaders

- Owner Reps' Responses
  - Owner's Rep.
  - Owner
  - Architect/Engineer
  - Gen. Contractor
  - Multiple Leaders

- Arch/Engs' Responses
  - Architect/Engineer
  - Owner's Rep.
  - Owner
  - Gen. Contractor
  - Multiple Leaders

- GCs' Responses
  - Gen. Contractor
  - Owner's Rep.
  - Multiple Leaders
  - Architect/Engineer
  - Owner

- Each group thinks that they can manage the process better than other groups.

- For the most part, no one thinks that multiple managers is an effective strategy.
WHAT DEFINES PROJECT SUCCESS

Owners and Owner reps seem to define success in exactly the same way.

Architects seem to care much more about owner satisfaction than about coming in on time and on budget.

GC’s are almost twice as likely as anyone else to use the quality of the process a primary indicator of project success.
In those instances in which you have been completely or partially dissatisfied with the outcome of a project, what has usually been the most important cause of your dissatisfaction?

- Named individual
- Communication
- Owner issues
- Teamwork
- Change orders
- Delays
- Costs/budget
- Quality issues
SOURCES OF DISSATISFACTION

OBSERVATION:
Even though success is often defined by time and budget...the greatest source of dissatisfaction is not time and money...

it’s...

TEAMWORK & COMMUNICATION

It’s not external problems that cause dissatisfaction (delays, material cost increases, change orders)...

it’s the way those things are handled by the team.

We learned about this organizational variable years ago.

WITHIN MOST ORGANIZATIONS, FRUSTRATION IS NOT CAUSED BY EXTERNAL FACTORS...BUT BY THE WAY THEY ARE HANDLED WITHIN THE COMPANY.
Experience with Various Project Delivery Systems

- Design-Bid-Build
- Design-Build
- Construction Manager, At Risk
- Construction Manager, Agent
- Bridging
- Alliancing

- Most respondents have a great deal of experience with traditional Design-Bid-Build and Design-Build and Construction Manager, at Risk systems.

- The Construction Manager, agent project delivery system is rare, as are the relative new systems – Bridging and Alliancing.
### ATTITUDES ABOUT DIFFERENT PROJECT DELIVERY SYSTEMS

#### WHICH ONE GIVES YOU THE BEST CHANCE OF PERFORMING ON TIME?

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<th>System</th>
<th>On Time</th>
<th>On Budget</th>
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<td>Design Build</td>
<td>Owners</td>
<td>Alliancing</td>
<td>CM @ Risk</td>
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PROCESS ACOUSTICS

Listening for Advanced Indicators of Project Health
Is it possible to identify a series of early indicators, not typically visible, that accurately predicts project stress?
GOALS

1. Illuminate the network of human commitments, opinions, and attitudes that drive the performance of interdisciplinary project teams.

2. Compare our psychological measurements to actual project outcomes in order to identify those variables that are reliable predictors of project performance.
MEASUREMENT

We anticipate utilizing a series of web-based questionnaires that can be answered by selected team members in no more than 20 minutes.

We intent to measure all psychological variables within two distinct contexts:

(1) the individual company team
(2) the interdisciplinary project team
PSYCHOLOGICAL CONSTRUCTS

CLARITY OF ROLES

Do all major participants understand their role?

Do they understand the roles of the other participants?
PSYCHOLOGICAL CONSTRUCTS

CLARITY OF COMMITMENTS

Contractual and non-contractual commitments
PSYCHOLOGICAL CONSTRUCTS

DEGREE OF COLLABORATION

How effective is the cooperation on the company team?

How effective is the cooperation on the interdisciplinary project team?
PSYCHOLOGICAL CONSTRUCTS

PERCEPTION OF VALUE

How do all participants perceive their value?

To what extent do they value each other?

Do they feel they are being allowed to add value?
PSYCHOLOGICAL CONSTRUCTS

PERCEPTION OF TRUST

Company team trust?

Project team trust?

Owner / user trust of consultants?

Owner / manager trust of consultants?
PSYCHOLOGICAL CONSTRUCTS

PERCEPTION OF BEING UNDERSTOOD

Do participants feel they are being listened to?
PSYCHOLOGICAL CONSTRUCTS

OPPORTUNITY FOR INDIVIDUAL INITIATIVE

Is this individual initiative valued? By whom?
PSYCHOLOGICAL CONSTRUCTS

HEALTH OF PROJECT TEAM SYSTEM THINKING

Does the project team share critical information efficiently?
PSYCHOLOGICAL CONSTRUCTS

IDENTIFICATION OF INITIAL TEAM BIASES

Before the work begins, what pre-existing attitudes and biases are present?
IMPLEMENTATION

• Set-Up
• Prepare System
• Monthly Monitoring
• Interim Reports
• Final Report