



CRGP Collaboratory for Research on Global Projects



# **Toward a Unified Theory of Project Governance**

*Economic, Sociological, Psychological and Technical Elements*

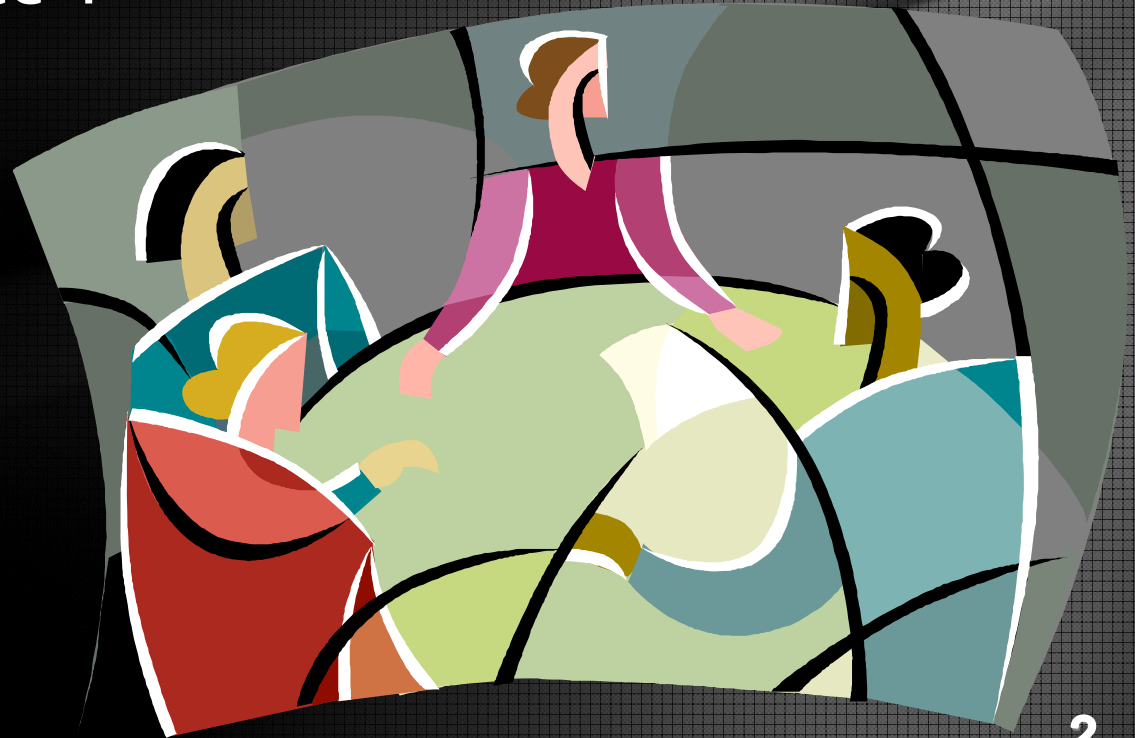
**Raymond E. Levitt**  
*Kumagai Professor of Engineering*  
*Director, Collaboratory for Research on Global Projects*

International Workshop on Integrated Design & Delivery Solutions (IDDS) — April 18 2012

# What is Governance?

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- ❑ *"...the process of governing a country or organization"*
  - *(includes transparency, accountability, access...)*
- ❑ What do we mean when we talk about "project governance"?



# Unified Theory of Project Governance:

## *OUTLINE*

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- ❑ Governance of Projects
  - Economic View of Project Governance
  - Organizational View of Project Governance
  - Technological Enablers of Project Governance
- ❑ Toward more fully aligned project governance
  - Integrated Project Delivery
  - PPP Procurement

# Unified Theory of Project Governance:

## *OUTLINE*

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### □ Governance of Projects

#### ■ Economic View of Project Governance

##### ○ Innovation challenges

##### ○ Very high transaction costs

#### ■ Organizational View of Project Governance

#### ■ Technological Enablers of Project Governance

### □ Toward more fully aligned project governance

#### ■ Integrated Project Delivery

#### ■ PPP Procurement

# Innovating in a Fragmented Supply Chain

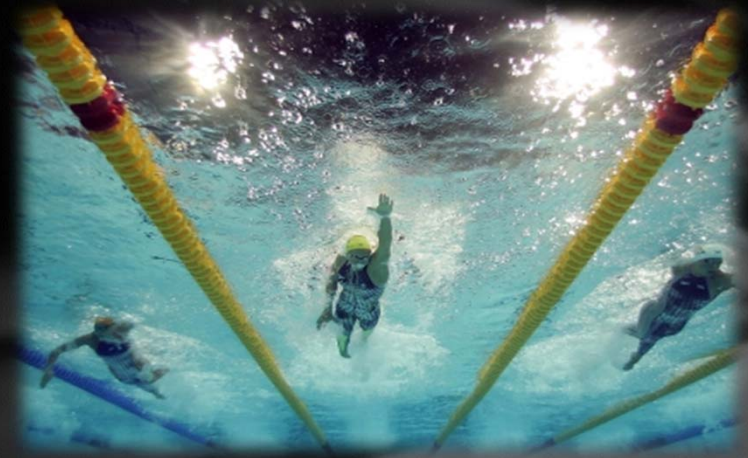
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**Supply Chain Fragmentation: Y2E2 Bldg.**

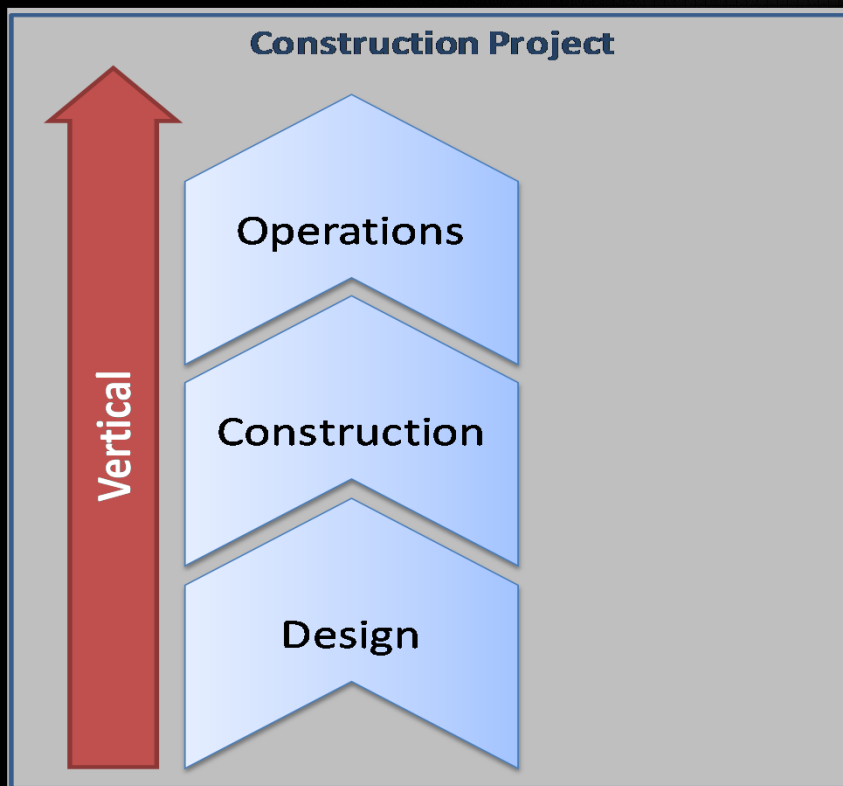
# “Modular” vs. “Integral” Innovations

- ❑ **Modular Innovations:** Innovate individual module within a single swim lane
  - More energy-efficient window assembly
  - New, more water-efficient bathroom/toilet fixture
  
- ❑ **Integral Innovations:** Affect the way that modules in multiple swim lane are integrated
  - Intelligent BMS that monitors indoor and outdoor temperatures and humidity, uses sophisticated software and firmware to activate the chiller, boilers, fans, window actuators, etc.



# The Nature of the Construction Industry

- ❑ Construction is a mature fragmented, modularized industry
- ❑ Its project supply chain is fragmented vertically



# “Broken Agency” Over the Project Lifecycle

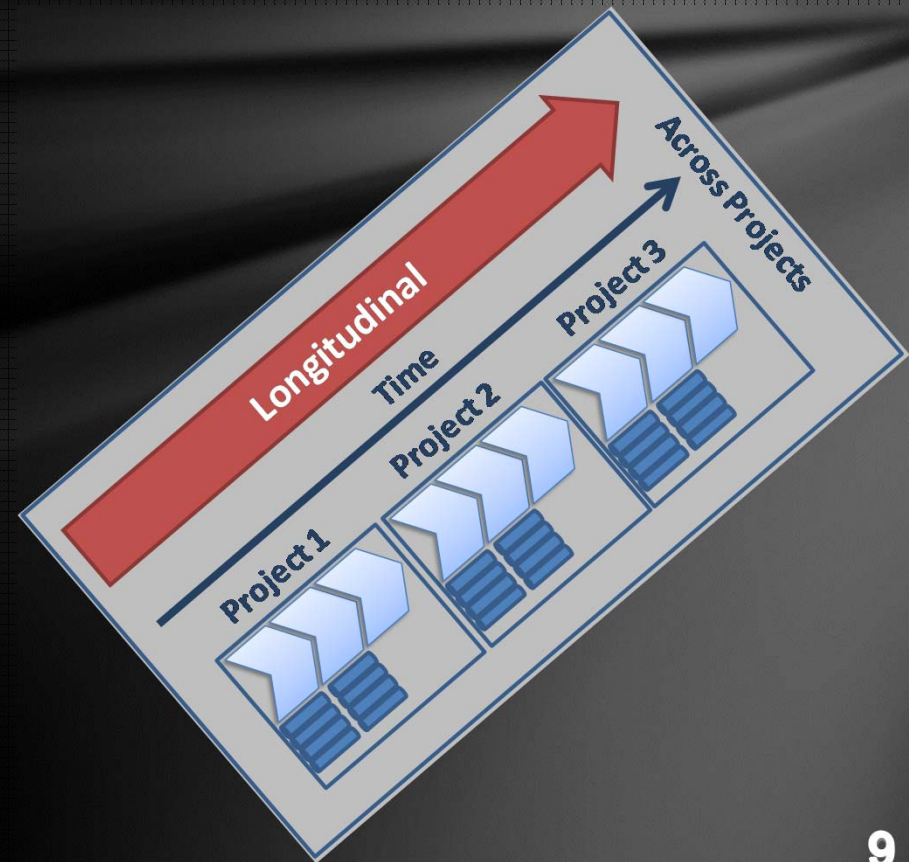
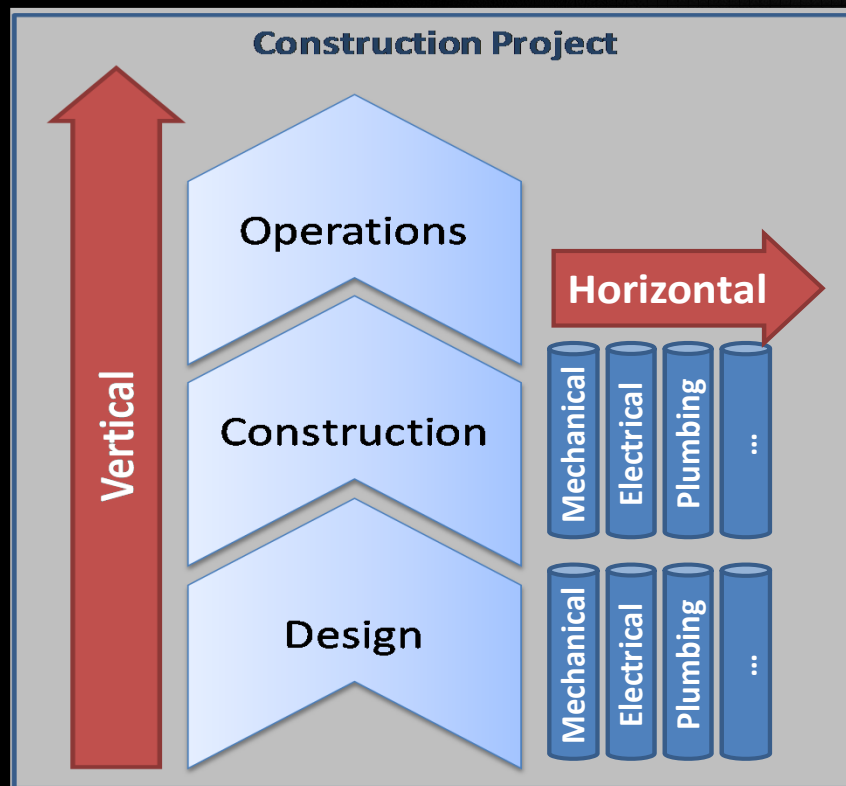
- ❑ *Because of vertical fragmentation (across the value chain), different parties incur the investment costs vs. receive the benefits over the lifecycle of a typical constructed facility*
- ❑ *This deters all investments in life-cycle sustainability*





# The Nature of the Construction Industry

- ❑ The supply chain is also fragmented **Horizontally** and **Longitudinally**



# Instability of the Project Team

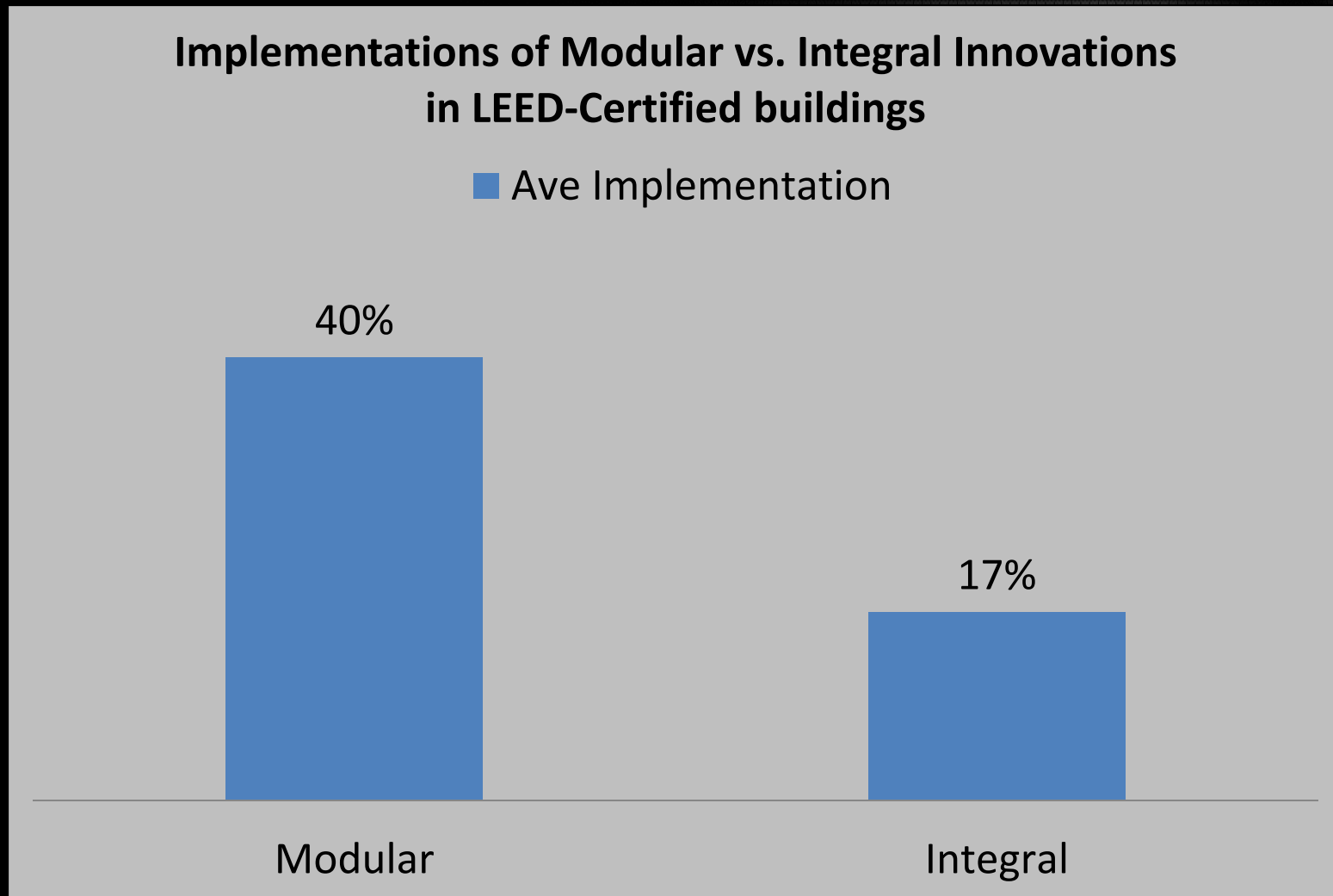
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- ❑ Horizontal + Longitudinal fragmentation deter integral innovation
  - Severe horizontal fragmentation of the construction supply chain is found in all market economies
  - In “coordinated market economies\*” like Japan or Finland, firms tend to stay together from project to project
  - In “liberal market economies\*” like the US, where teams are most often assembled by competitive bidding, supply chain partners keep changing from project to project
- ❑ So longitudinal fragmentation is more pronounced in liberal market economies, slowing the diffusion of integral innovations

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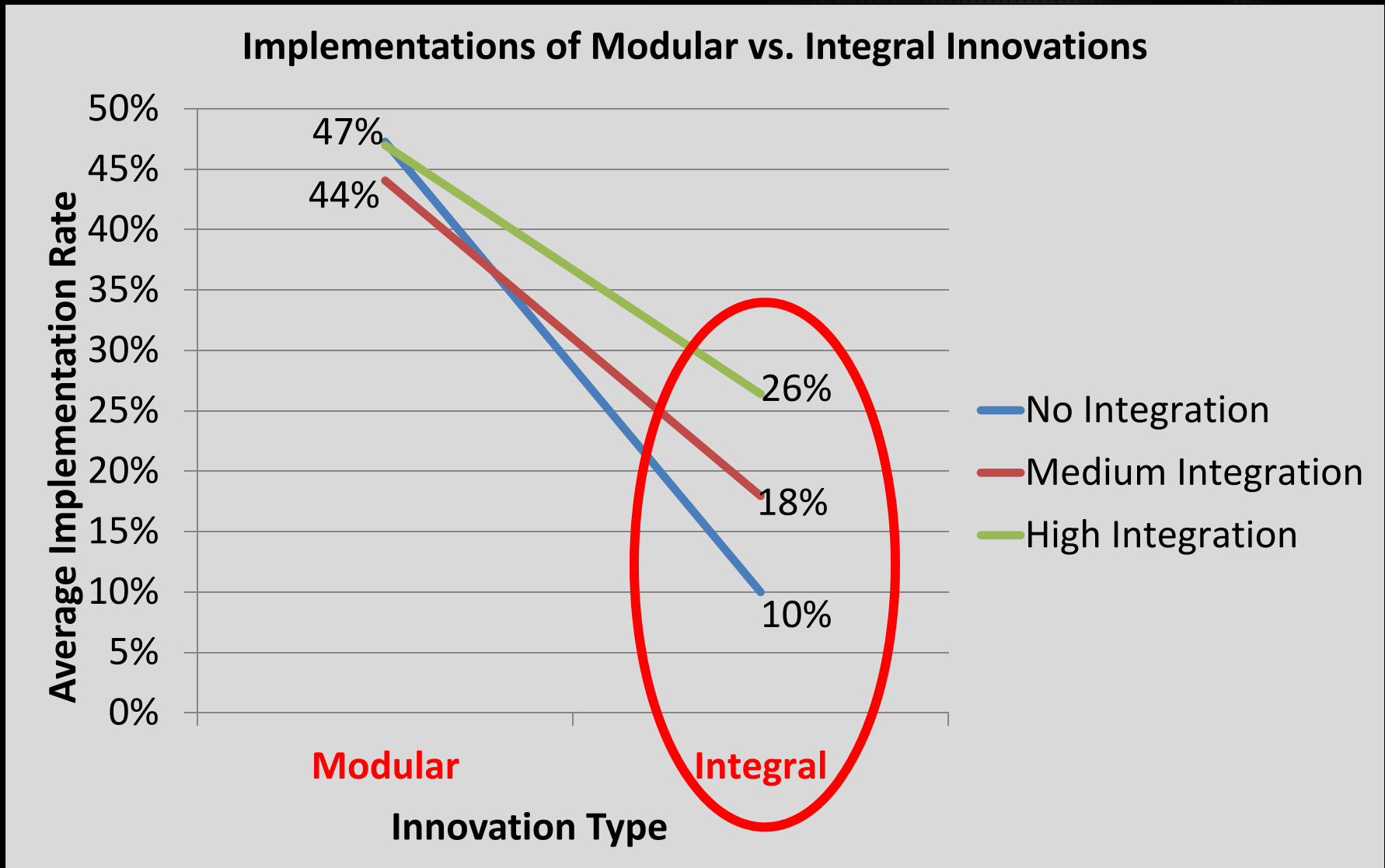
\* Peter A. Hall and David Soskice (2001). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press.

# “Synchronized Swimming” is difficult in the US!



Sheffer, D. and Levitt, R. (2012) "[Fragmentation inhibits innovation: Overcoming professional and trade lock in](#)" CRGP Working Paper #0069.

... but integration of the supply chain helps



Sheffer, D. and Levitt, R. (2012) "Fragmentation inhibits innovation: Overcoming professional and trade lock in." CRGP Working Paper #0069 <http://crgp.stanford.edu>

# Unified Theory of Project Governance: *OUTLINE*

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## □ Governance of Projects

### ■ Economic View of Project Governance

- Innovation challenges

- Very high transaction costs

### ■ Organizational View of Project Governance

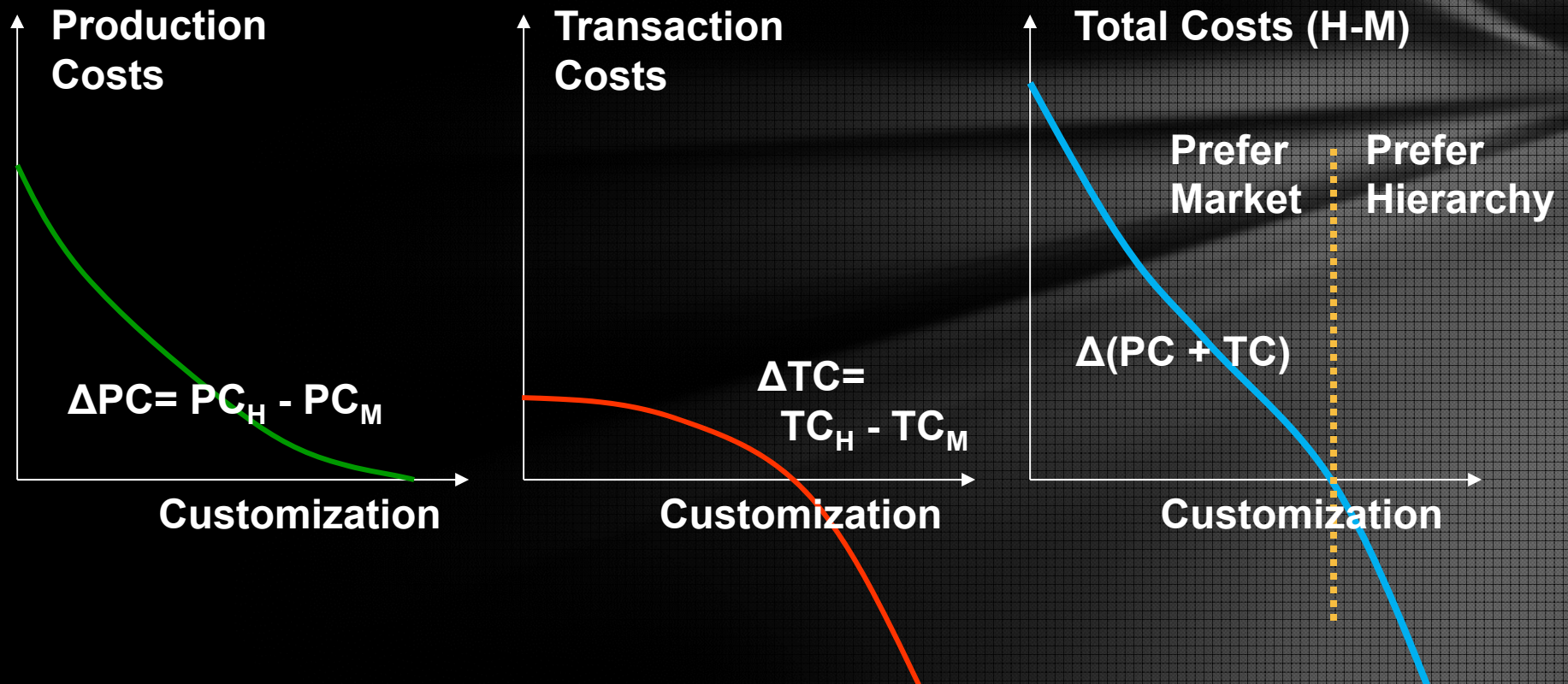
### ■ Technological Enablers of Project Governance

## □ Toward more fully aligned project governance

### ■ Integrated Project Delivery

### ■ PPP Procurement

# Economic View of Governance: *Governing Transactions in Markets vs. Hierarchies*



# Govern Projects in Markets

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- ❑ Construction is highly customized, so transaction costs favor governance by hierarchy...
- ❑ ...but severe demand fluctuations even more strongly favor production by specialized, local firms—i.e., governance by market.
- ❑ So we govern many kinds of construction projects primarily via markets, even though this causes very high transaction costs!

# Unified Theory of Project Governance: *OUTLINE*

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- ❑ Political Governance of Construction Sector
- ❑ Governance of Projects
  - Economic View of Project Governance
  - Organizational View of Project Governance
    - Projects as “Virtual Hierarchies”
  - Technological Enablers of Project Governance
- ❑ Toward more fully aligned project governance
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# Recreate Hierarchy through Contracts

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- ❑ Where high transaction costs suggest that projects should be governed as hierarchies...
- ❑ ...but projects are governed in markets for production cost reasons, ...
- ❑ ...contracts evolve over time to include clauses that re-create “virtual hierarchies”
- ❑ So a construction project is governed as a virtual hierarchy comprised of firms in a market!

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Stinchcombe, A. L. 1990. “Organizing information outside the firm: Contracts as hierarchical documents.”  
in A. L. Stinchcombe (Ed.), *Information and Organizations*: 194-239. Berkeley: University of California Press.

# Organizational view of Project Governance

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- ❑ Humans are not just “homi economici”
- ❑ Incentives and legal mechanisms clearly do affect behavior
  
- ❑ But so do ‘**Institutions**’
  - “What is appropriate behavior for someone with my role and identity in this situation?”



# Organizational view of Project Governance: *Sociological and Psychological Elements*

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- ❑ An exciting vision and mission clarifies purpose, engages employees' shared identity and infuses meaning into work
- ❑ A strong organizational culture, reinforced by authentic leadership, sanctions deviant behaviors socially
- ❑ Long term "co-location" facilitates social exchange among employees to develop mutual trust
- ❑ Symbols (e.g., logos, taglines) and investments in branding enhance employees' sense of shared identity and purpose

# Project Governance Recap

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- ❑ So the governance of a construction project lies somewhere between:
  - **Administer a long-lived set of multi-party transactions in a fragmented supply-chain**

and

- **Manage a relatively short-lived “virtual hierarchy”**

# Institutional Theory:

## *Unifies Market and Hierarchical Governance*

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### ❑ Three Pillars of Institutions:

- **Legal/Regulatory** (laws, regulations, contracts, courts, justice systems)
- **Normative** (group norms, social conventions)
- **Cognitive** (systems of meaning, beliefs, values, identity)



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\* Scott, W. Richard (2008). *Institutions and Organizations, 3<sup>rd</sup> Edition*, Sage Publications.

# Unified Theory of Project Governance: *OUTLINE*

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- ❑ Political Governance of Construction Sector
- ❑ Governance of Projects
  - Economic View of Project Governance
  - Organizational View of Project Governance
  - Technological Enablers of Project Governance
    - BIM Enables “Serious Play”
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# Use of Shared BIM Models Enables “Serious Play”\*

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- ❑ Credible simulation models whose inputs and outputs can be visualized facilitate difficult conversations among interdependent parties
- ❑ This lifts groups out of the “ground effect” of conflict and competition, to enable “serious play”

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Michael Schrage (2000). *Serious Play: How the World's Best Companies Simulate to Innovate*, Harvard Business Press.

# Recap of Unified Project Governance

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- ❑ A Construction Project is a Combination of:
  - A long-lived, complex, uncertain, multi-party transaction
  - A short-lived, unstable “virtual hierarchy”

## GOVERNANCE PRINCIPLES

- ❑ Long-lived, complex, uncertain, multi-party transaction
  - Align incentives through IPD-like contracts
  - Reconfigure supply chain to invest sustainably and innovate
- ❑ Short-lived, unstable “virtual hierarchy”
  - Align sociological (“normative”) elements
  - Align psychological (“cognitive”) elements
  - Leverage appropriate technologies



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# Examples of Aligned Project Governance



**Heathrow Terminal Five**



**Children's Bellevue Hospital, Seattle**



**Confederation Bridge, PEI, Canada**

# Firms with Strategically Integrated Supply-Chains:

*Incent sustainable investments & encourage innovation*

- ❑ Integrate Vertically
  - Arbitrage broken agency

- ❑ Integrate Horizontally
  - Enable supply-chain learning



**Make Your Buildings Work**

MORE EFFICIENTLY, SUSTAINABLY AND PROFITABLY

# Toward Fully Aligned Governance — IPD

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- ❑ “Full IPD” multi-party contracts with:
  - Legal/Regulatory governance aligned
  - Normative governance aligned
  - Cognitive governance aligned
  - Supply chain virtually integrated
  - Technological enablement of collaboration

# Toward Fully Aligned Governance —PPP/ESCO

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- ❑ PPP Infrastructure delivery concession or ESCO energy solution for which:
  - Effective “strategic communication” with public
  - Concessionaire’s contract aligns with long-term societal needs
  - Design-Build-Operate delivery process used
  - Ownership structure provides appropriate performance incentives, while guarding against “self-dealing”

# Partially Aligned Governance

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- ❑ Promises of repeat-business (the TCE solution) that are not sustainable with high demand fluctuation
- ❑ Cost-plus fee reimbursable contracts, without realigning normative and cognitive institutions of team members
- ❑ “Partnering” workshops and “handshake agreements” to align normative and cognitive institutions, overlaid on a conventional design-bid-build delivery with lump-sum or fixed-unit-price contract
- ❑ Broken agency from vertical fragmentation that undercuts investments in sustainability at all stages of the lifecycle, e.g., “triple-net” commercial real estate leases that pass energy costs onto tenants

# Comments and Questions



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INFRASTRUCTURE ■ FINANCE ■ GOVERNANCE ■ SUSTAINABILITY

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