The Knowledge Leader for Project Success

Owners • Contractors • Academics

Collaboration and 10-10: New Frontiers in Project Performance Assessment

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- Lecturer, Researcher, and Consultant in the benchmarking of capital projects
- Program Management Expert
- Former employee of Fluor (Constructability Coordinator and Field Engineer), Phillips Petroleum, Bechtel, ePM, and Texas State University

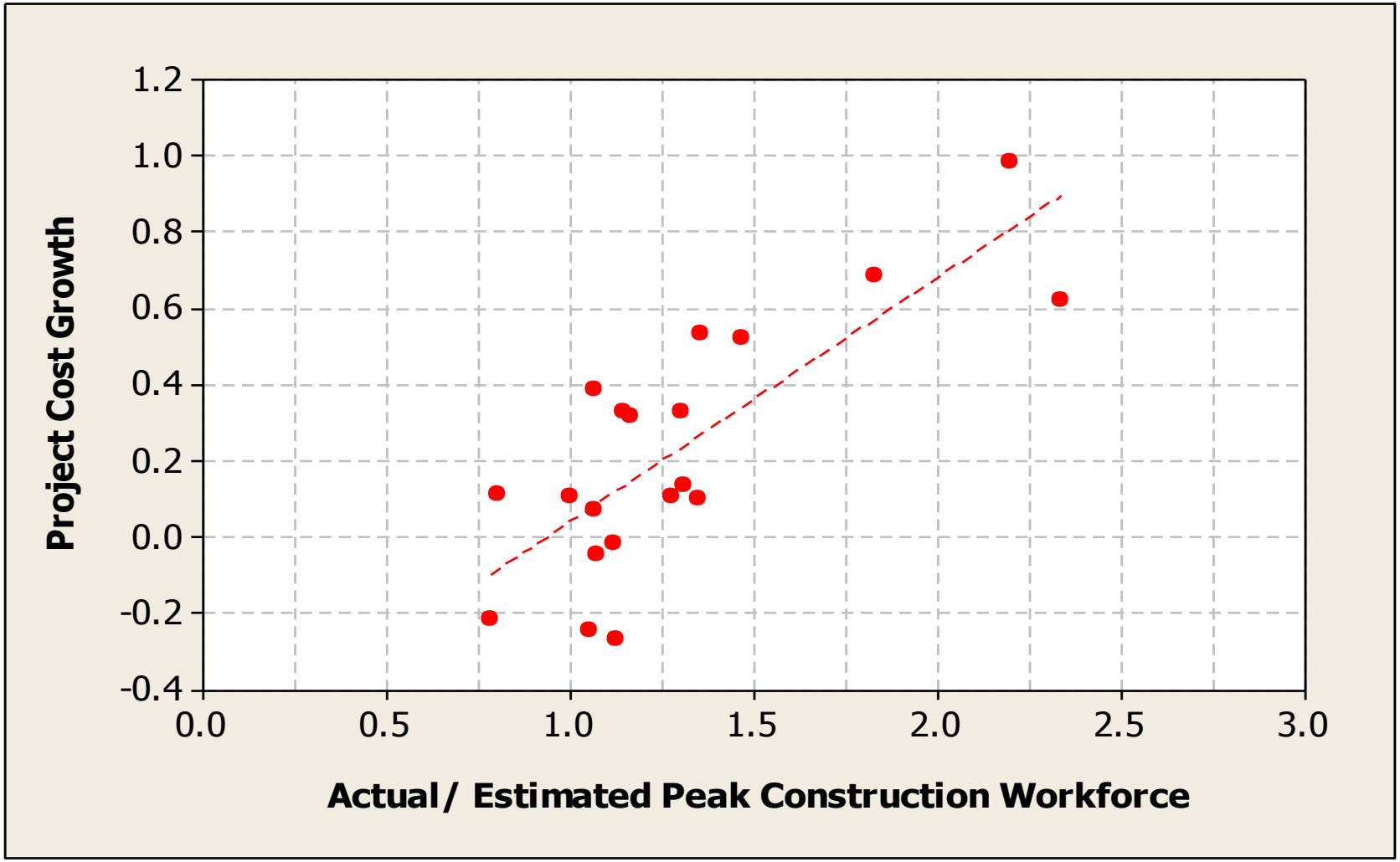
Construction Industry Institute®

- A consortium of leading owners, contractors, and academics working collaboratively to improve the constructed project and the capital investment process.
- An organized research unit of the Cockrell School of Engineering at The University of Texas at Austin.

Agenda

- NWCCC 2013:
  - Capital Projects should be a **strategic weapon** in the creation of benefits driving shareholder value.
  - Today's business leaders perceive capital projects as a **"necessary evil"** – as risky and plagued by cost and schedule overruns that erode benefits.
  - Construction Industry Institute (CII) identified the root causes of benefits subtraction as **poor working relationships, dysfunctional team dynamics, and ineffective contract management**.
  - 10-10: How CII is changing the notion of benchmarking in capital projects by **measuring the "softer side" of project management** and how this form of communication radically improves project outcomes.
- NWCCC 2014
  - **10-10 Leading Indicators**
  - **10-10 Results** from 600+ Projects
  - New Frontiers: **Program Management, Program Renewal,** and **AWP**

Actual / Estimated Peak Construction Workforce



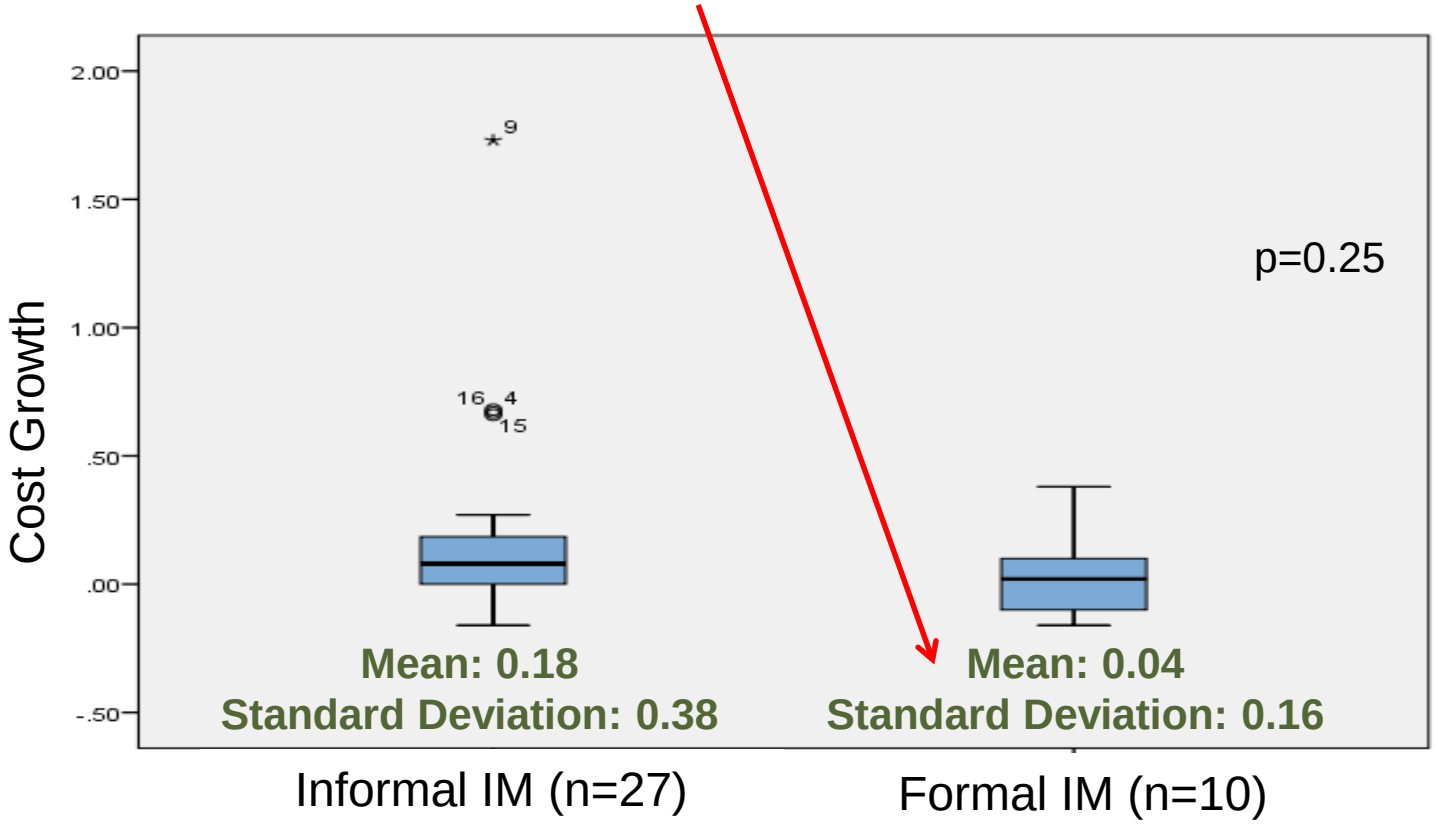
Collaboration?

- Communicate Too Much or Not Enough?
- Lines of Communication = (n(n-1))/2

# Project Team Members	# Lines of Communication
7	21
15	105
50	1225
100	4950
500	124750

Interface Mgmt. vs. Project Cost Growth

- Formal IM projects had lower mean of cost growth and less standard deviation



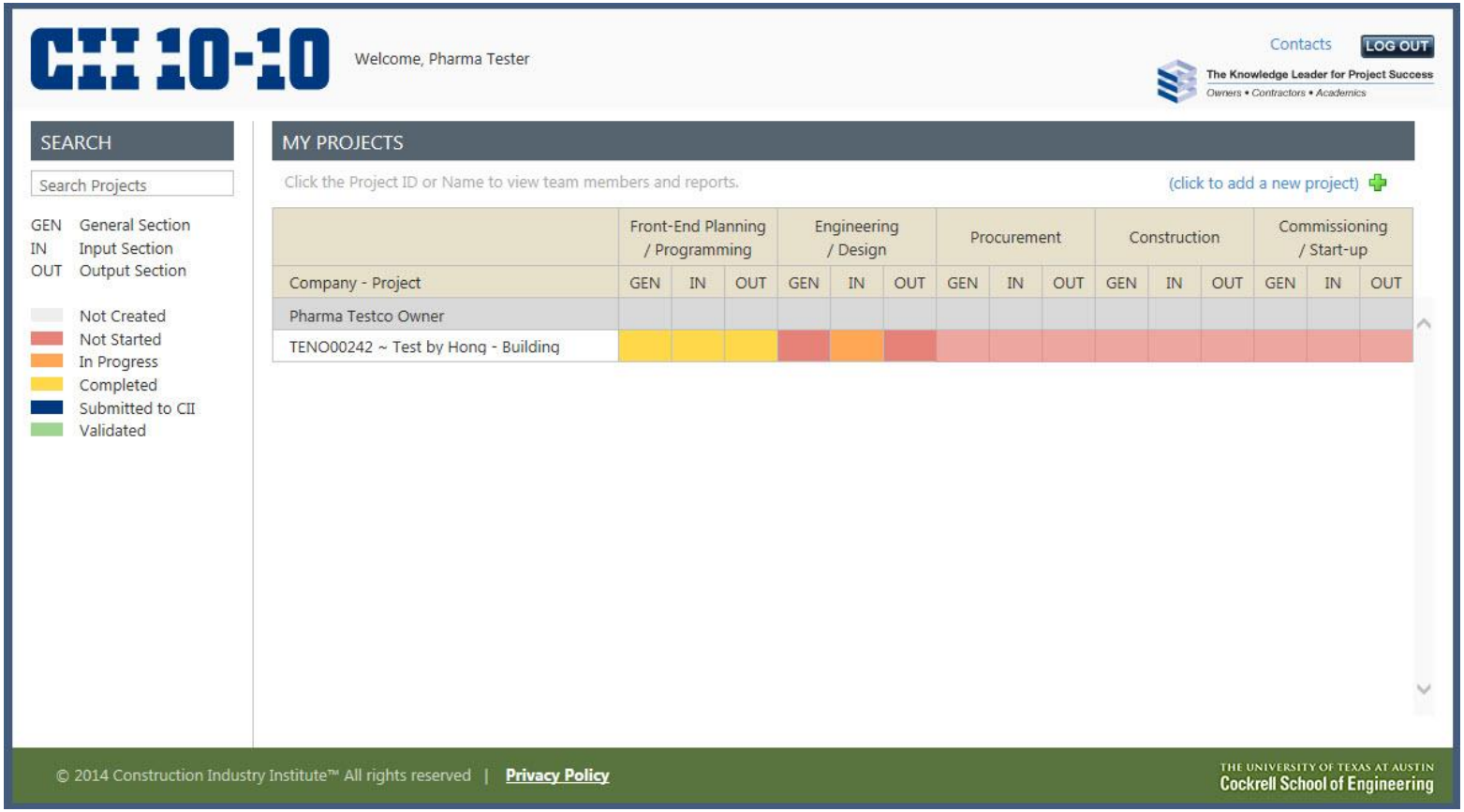
- “It’s unbelievable how much you don’t know about the game you’ve been playing all your life.
  - Mickey Mantle

A, B, or C Team? How to Know / Measure?

- 5 Principles of Project Integration
  - Work and Work Process
  - Organizational Engineering
  - Leadership and Governance
  - Communications and Information Flow
  - Business Environment and Culture
- CII's 10-10 Program Measures
  - 10 Leading Indicators
  - 10 Performance Outcomes (Cost, Capacity, etc.)

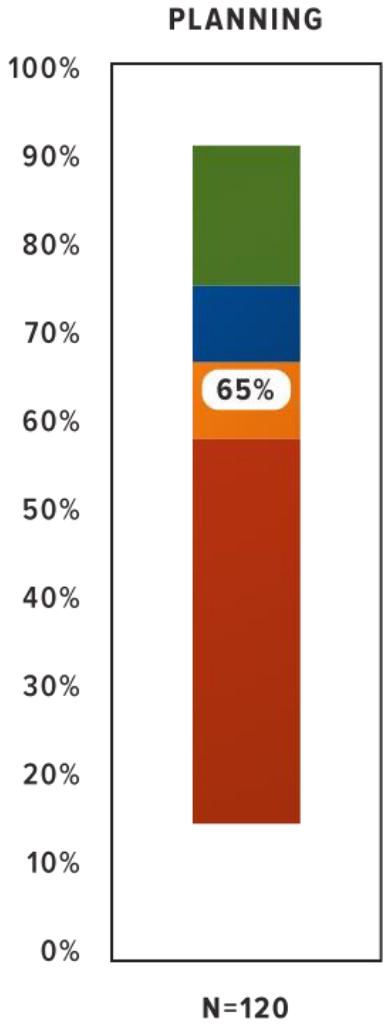
CII's 10-10 System

- Newest Strategic Weapon for Capital Projects



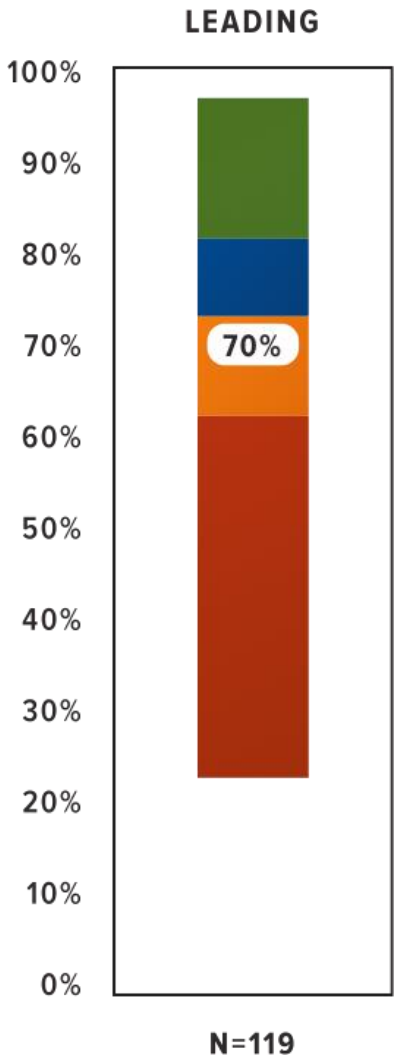
10 Leading Indicators

1. **Planning:** The work a manager performs to predetermine a course of action. The function of planning includes the following activities: Forecasting, Objective Setting, Program Development, Scheduling, Budgeting, and Policies and Procedures Development.
2. **Organizing:** The work a manager performs to arrange and relate the work to be done so people can perform it most effectively. The function of organizing includes the following activities: Development of Organization Structure, Delegation of Responsibility and Authority, and Establishment of Relationships.



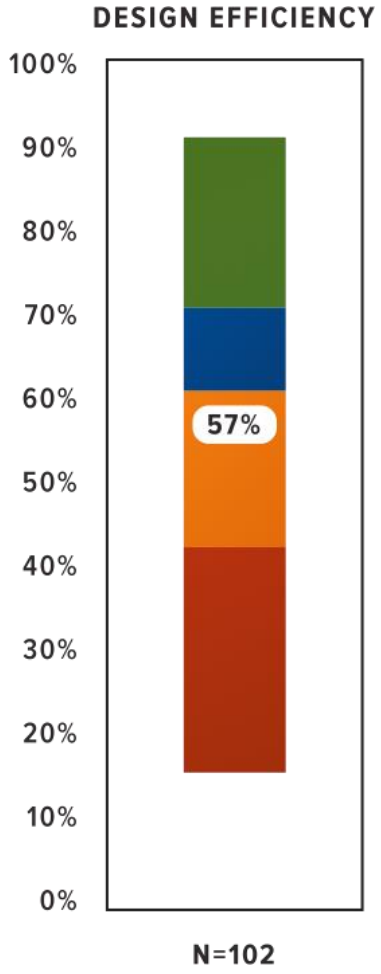
10 Leading Indicators

3. **Leading:** The work a manager performs to cause people to take effective action. The activities involved in the function of leading include: Decision-Making, Communications, Motivation, Selection of People, and Development of People.
4. **Controlling:** The work a manager performs to assess and regulate work in progress and completed. Management controls are achieved through the following activities: Establishment of Performance Standards, Measurement of Performance, Evaluation of Performance, and Correction of Performance.



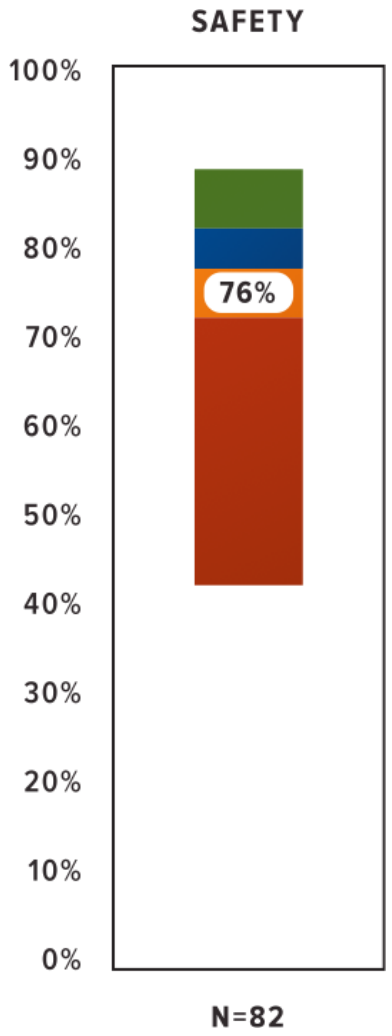
10 Leading Indicators

5. **Design Efficiency:** Measures if the project team is exhausting all techniques to optimize the design in its use of material quantities to provide maximum capacity at minimum cost.
6. **Human Resources:** Examines if the project is staffed correctly, with a minimum amount of staff turnover and appropriate training. Measures if people are capable of achieving project goals.
7. **Quality:** Measures if the project team is strictly conforming to project requirements. Analyzes if programs are pursued to assure the delivery of material goods as intended.



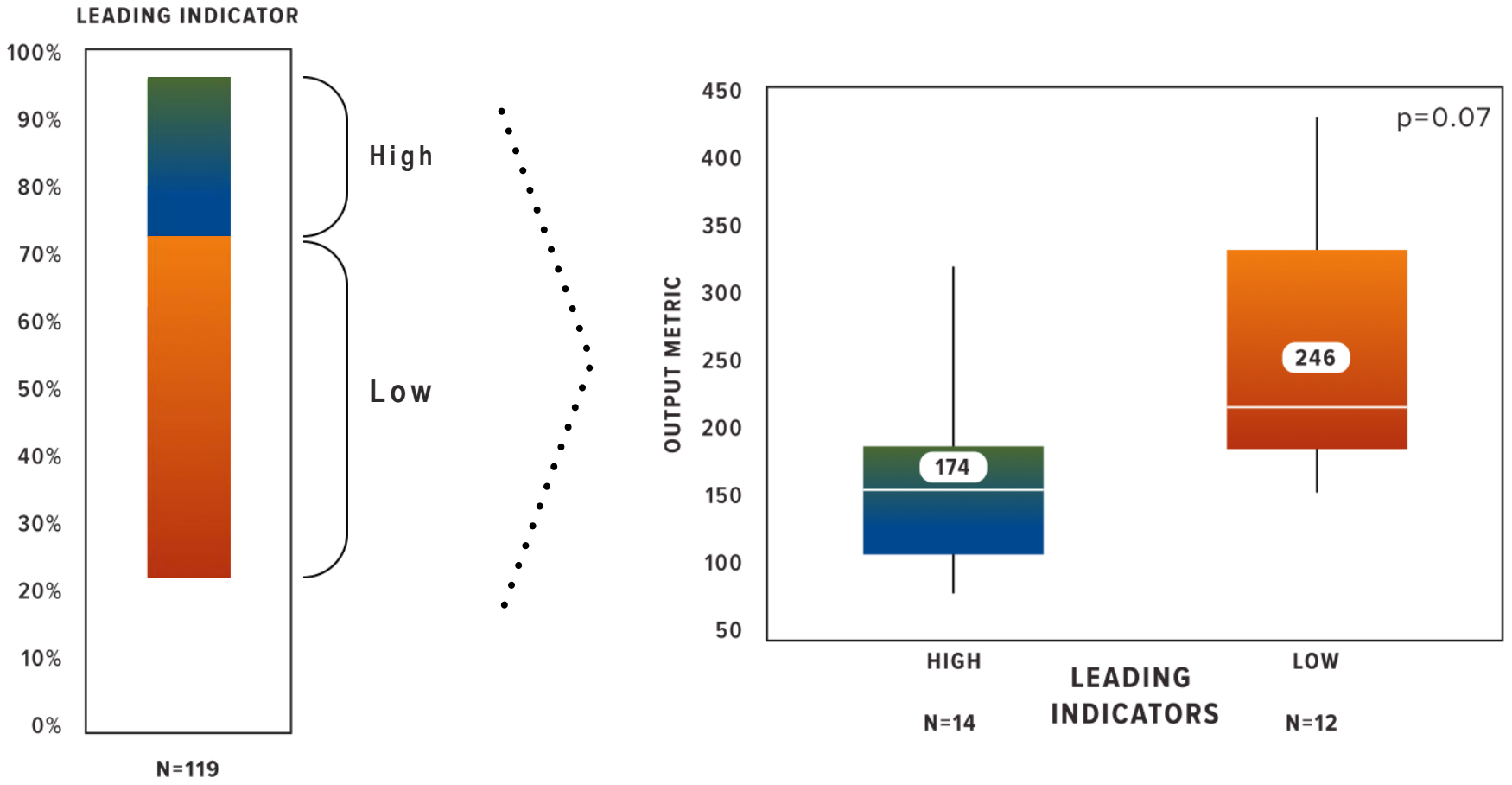
10 Leading Indicators

8. **Sustainability:** Evaluates steps taken by the project team to reduce the environmental impact of the project during construction and operation.
9. **Supply Chain Management:** Examines the strategies used by the project team to promote enhanced working relationships amongst all project stakeholders including those in the project supply chain.
10. **Safety:** Measures the steps followed by the project team to eliminate any possibility of personal injury or property damage on the project.



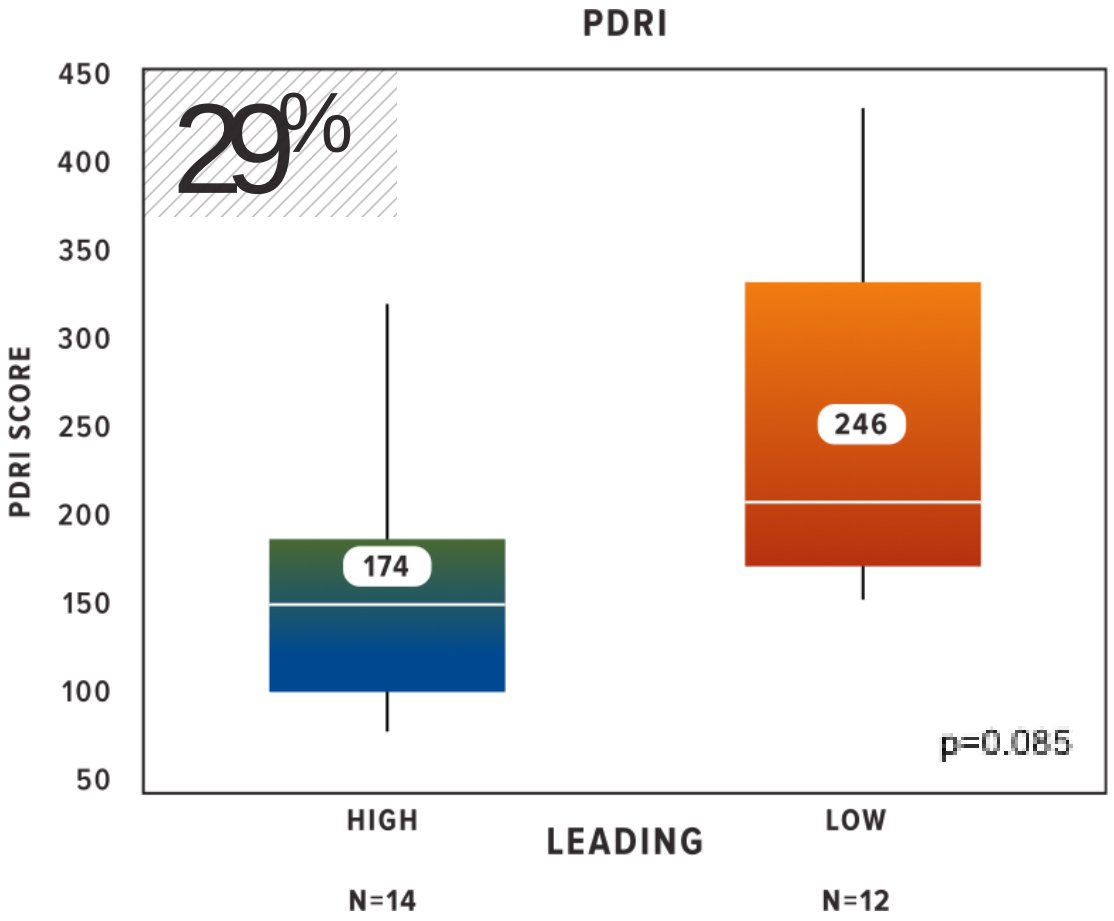
Round 1 Results (600+ Global Projects)

- Typical Analysis of a Leading Indicator



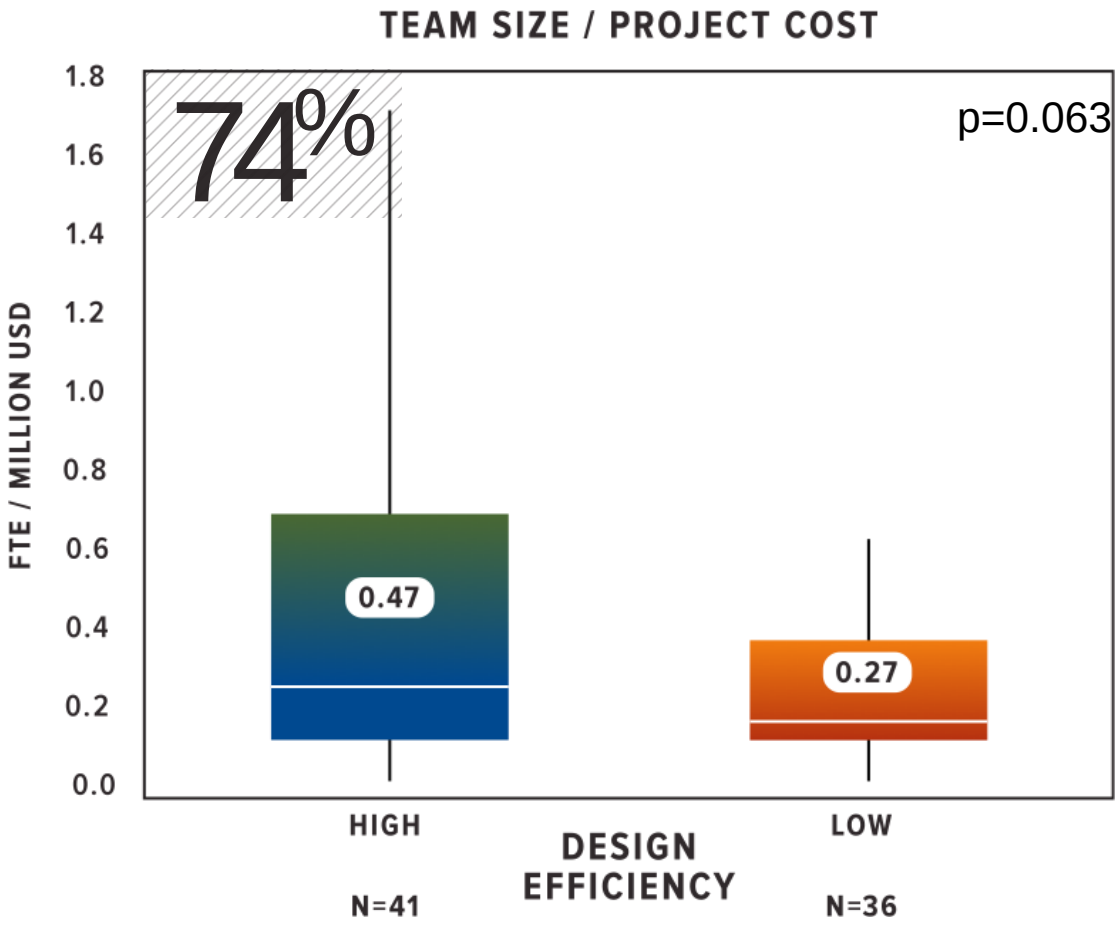
Front End Planning (FEP)

- Effect of Leadership



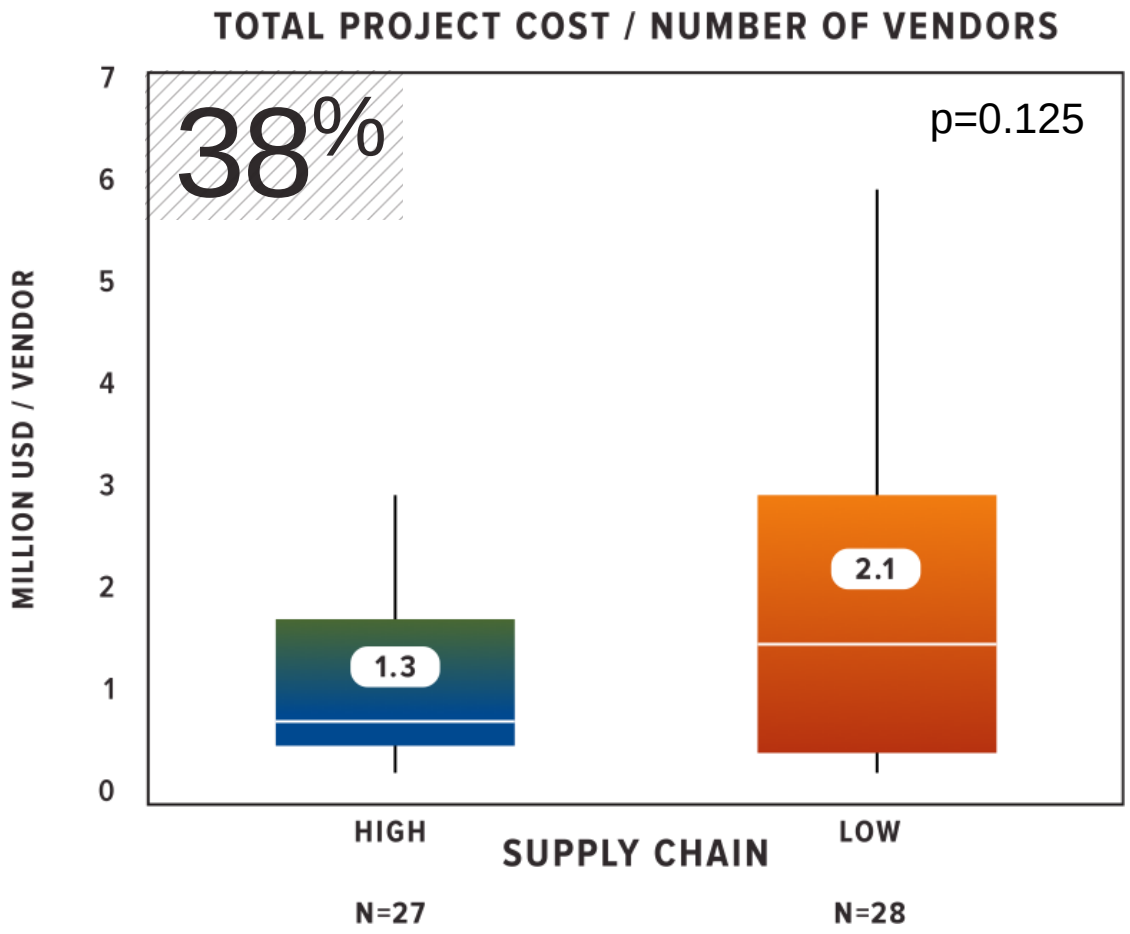
Engineering (Design)

- Impact of Design Efficiency



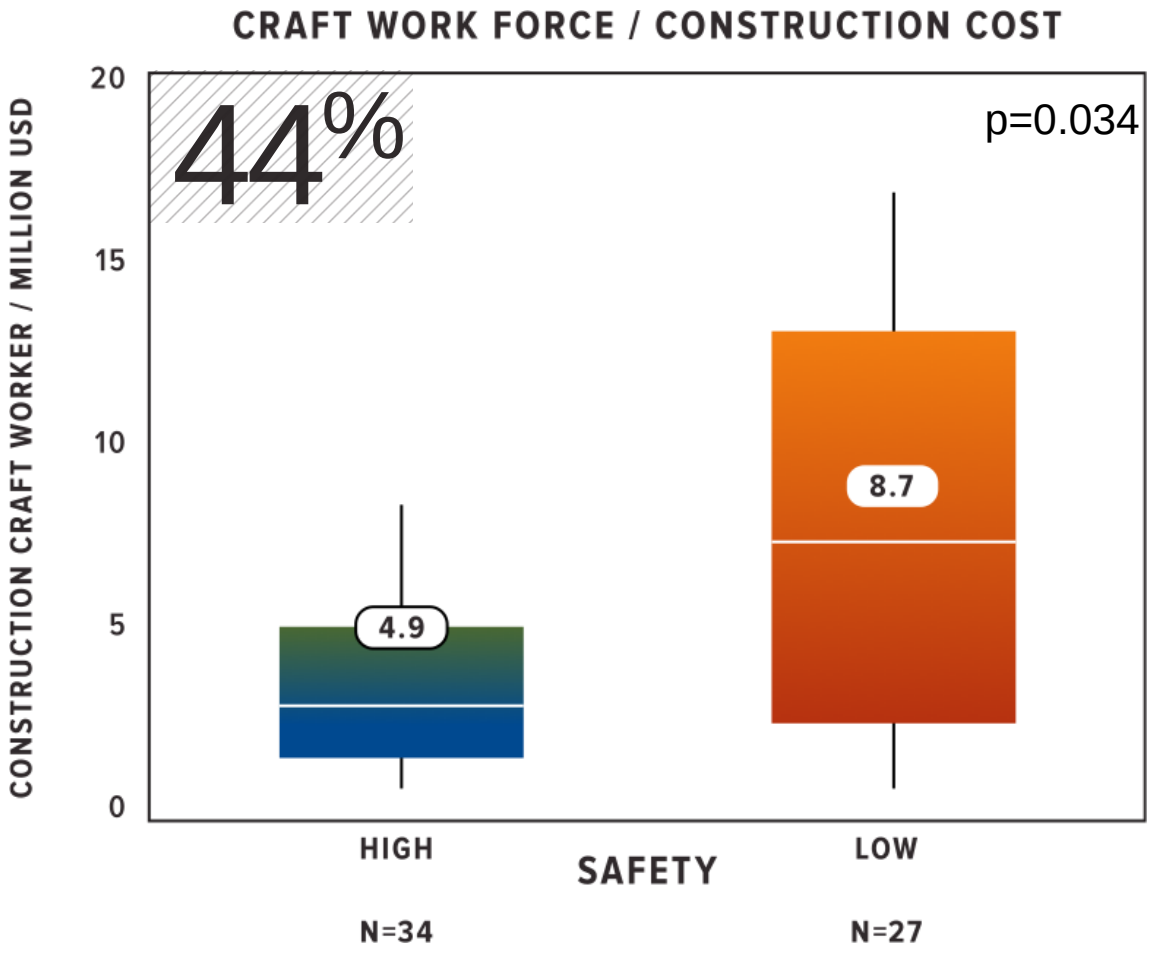
Procurement

- Effect of Supply Chain



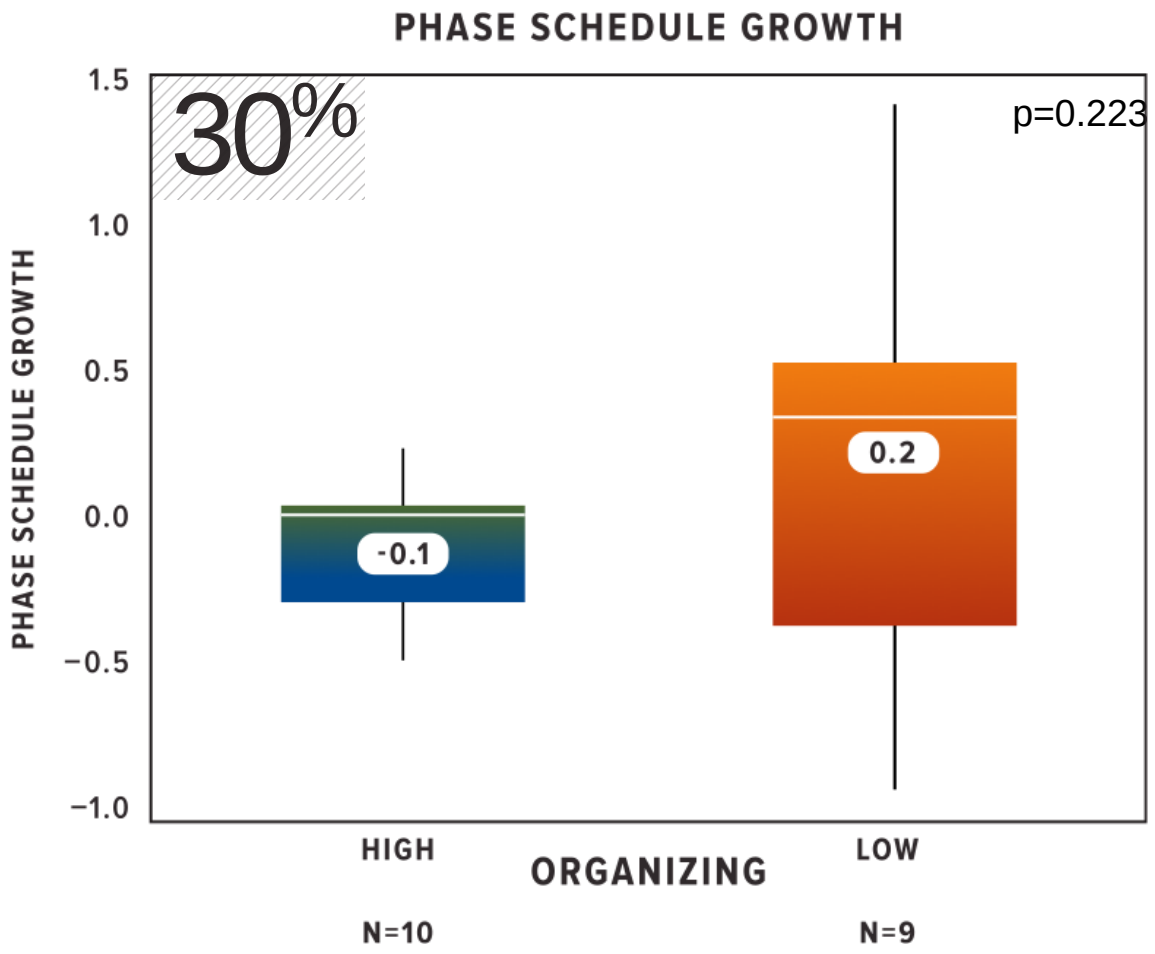
Construction

- Impact of Safety

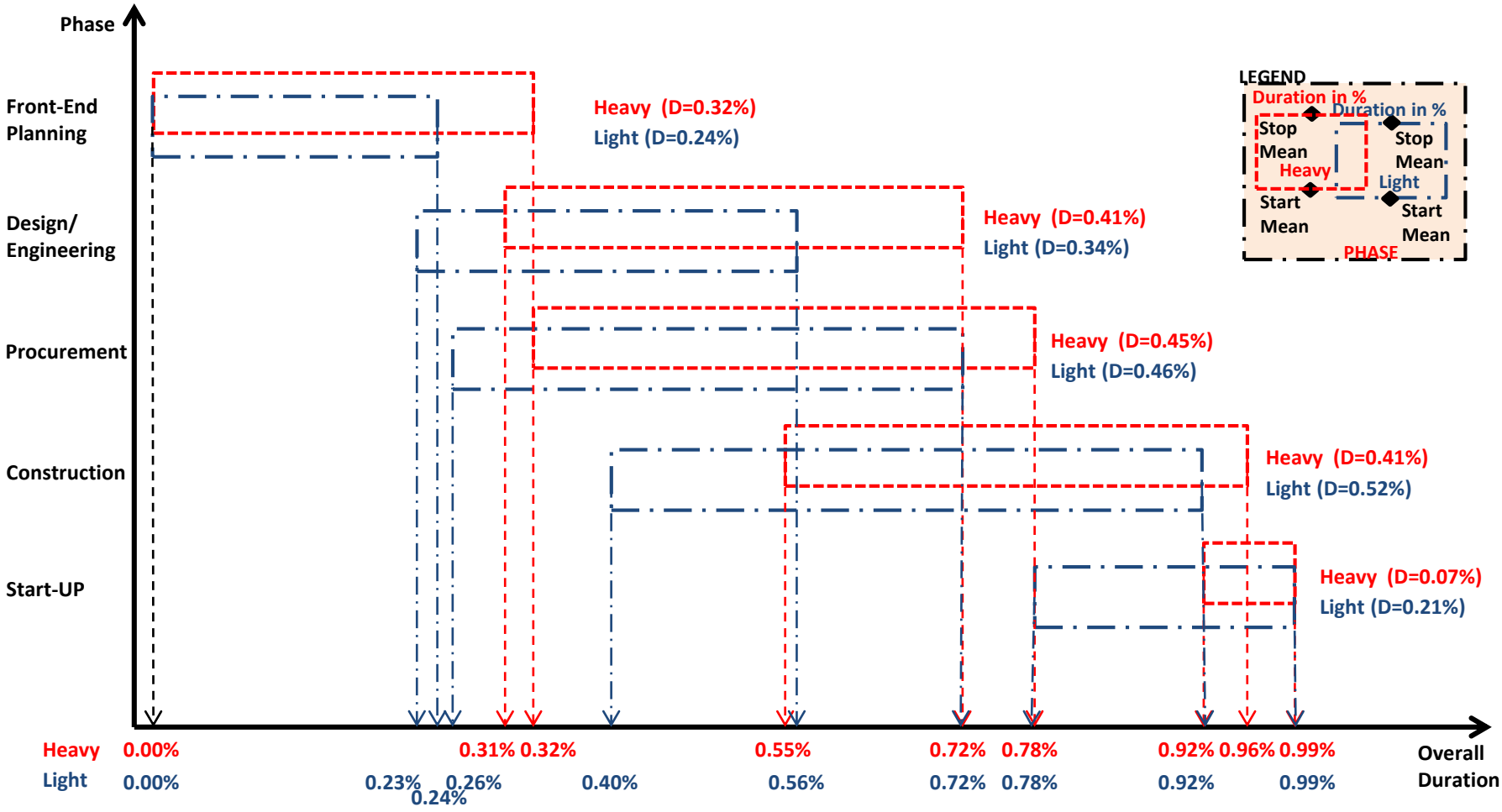


Start Up / Commissioning

- Effect of Organizing



Ongoing CII Research: Arrangement of Phases



10-10 Program Implementation

- Results

CII 10-10

CII 10-10 Performance Assessment Report
Industrial Projects - Engineering Phase
TENC12345 ~ Zydeco Chemicals Expansion

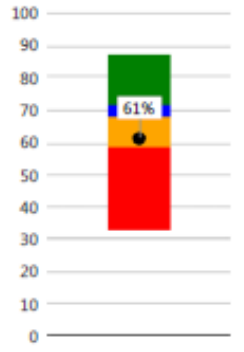
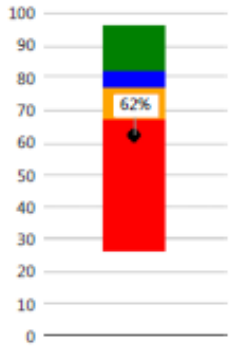
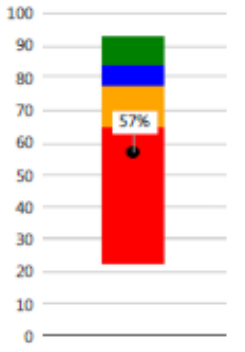
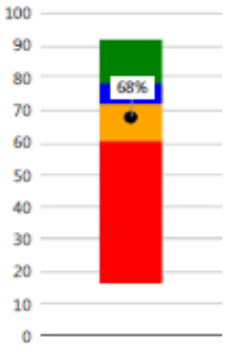
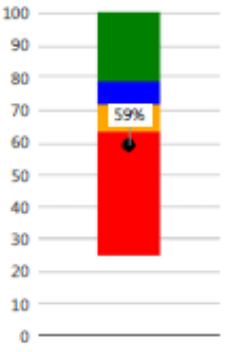
Date: Sep 10, 2014

Project General Information

Company:	CII Engineering & Construction. Co.
Project:	Zydeco Chemicals Expansion
ID:	TENC12345
Location:	New Orleans, Louisiana, United States
Project Type:	Chemical Manufacturing
Capacity:	100,000.00 short tons per day

Total Project Cost	
Local (2011):	USD 275,000,000
Chicago (2013):	USD 289,382,845
Midpoint of Phase:	Dec 17, 2011
Forecasted Phase Duration:	65.00 wks
Actual Phase Duration:	91.29 wks

Input Measures

Planning	Organizing	Leading	Controlling	Design Efficiency
				
Score: 61% N: 45	Score: 62% N: 46	Score: 57% N: 46	Score: 68% N: 46	Score: 59% N: 46

Planning					Organizing					Leading					Controlling					Design Efficiency				
Min	1Q	2Q	3Q	Max	Min	1Q	2Q	3Q	Max	Min	1Q	2Q	3Q	Max	Min	1Q	2Q	3Q	Max	Min	1Q	2Q	3Q	Max
33%	59%	68%	72%	86%	26%	67%	77%	82%	96%	23%	65%	78%	84%	93%	17%	61%	72%	78%	91%	25%	64%	72%	79%	100%

10-10 Program Implementation

- Question Mapping

Question – Input Metric map

	Industrial Projects – Construction Phase	Planning	Organizing	Leading	Controlling	Design Efficiency	Human Resources	Quality	Sustainability	Supply Chain	Safety
G	What was the typical foreman to craft ratio?		■		■		■				
G	Overall how many workers per safety professional were typically (i.e., in terms of the average workforce) on site?				■		■				■
4	Did the project objectives change during Construction?	■				■					
5	This project experienced a high number of:	■									
6	Was a turnaround involved in the scope of this project?	■			■		■				
7	Please characterize how project meetings were conducted.			■	■						
8	Which of the following statements characterized the decisions made by the manager(s) of this project?			■							
9	This project used the following methods.	■	■	■	■	■		■			■
10	Formal (classroom) safety training was attended:			■							■
11	Did the original primary contractor(s) complete the project?		■								
13	Was safety performance a criterion for contractor and subcontractor selection?		■								■
14	Were safety toolbox meetings held daily?										■
15	Were accidents including near misses formally investigated?										■
16	The availability and competency of craft labor was adequate.	■					■	■			■
17	The owner level of involvement was appropriate.	■	■	■							
18	The owner and primary contractor(s) maintain a long-standing partnering arrangement.	■	■	■						■	

10-10 Program Implementation

- 10-10 System Access
  - https://www.construction-institute.org/10-10
- 10-10 User Manual
  - https://www.construction-institute.org/10-10/UserManual.docx
- 10-10 General Information
  - http://www.10-10program.org
- Questions about 10-10?
  - e-mail: 10-10program@cii.utexas.edu

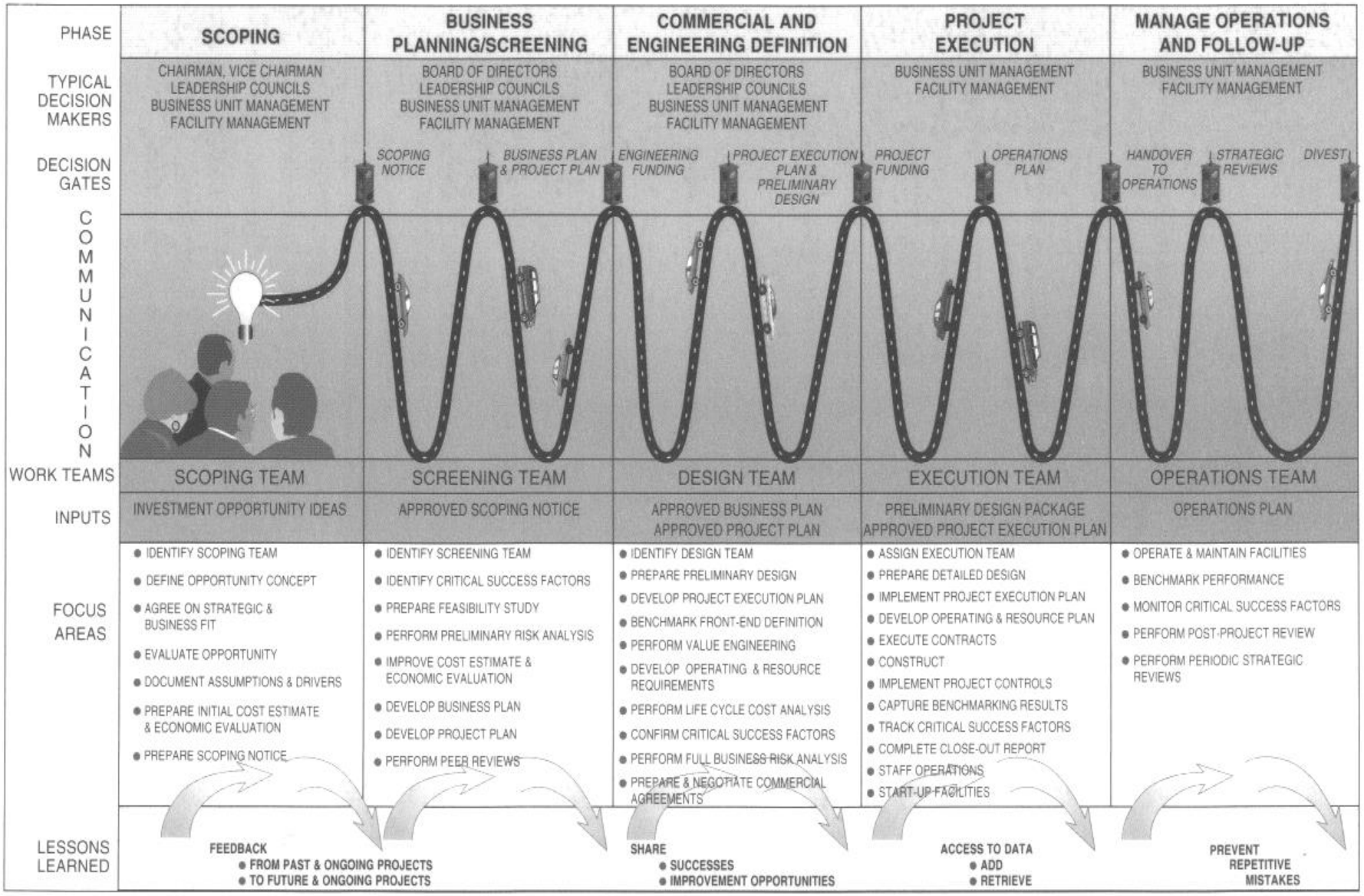
NEW FRONTIERS

Background

- Owner's Capital Budgeting Process
  - Used to select projects for funding
  - Based on financial prioritization (NPV, ROR)
- Asset Development Processes (ADP's)
  - Track each project through its phases
  - Do not examine portfolio benefits
- Program Renewal
  - Links business and project leadership
  - Ensures that projects are 'built right'
  - Ensures that 'right' projects are 'built'

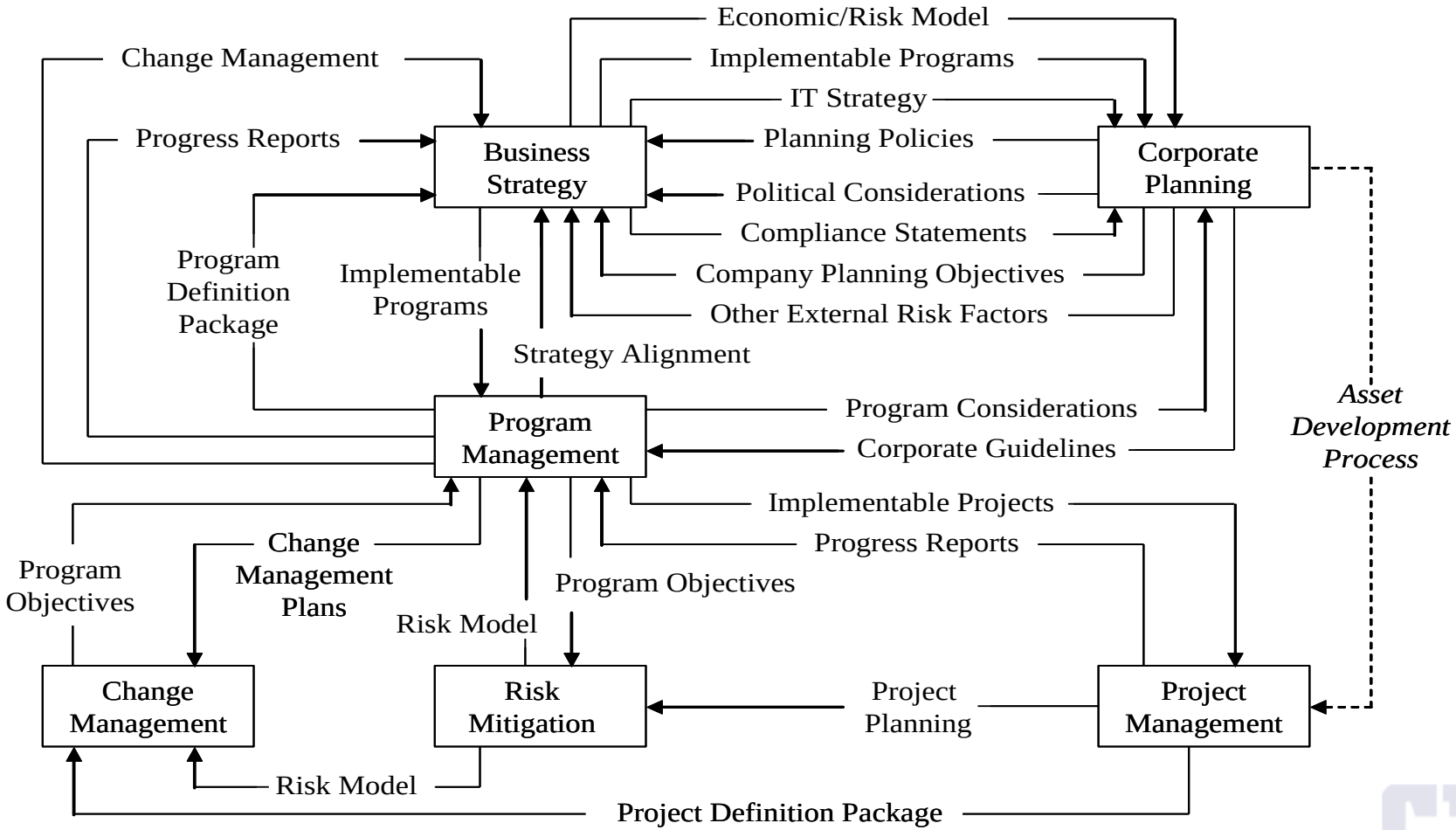
Texaco's ADP

BUSINESS ROADMAP FOR ASSET & VALUE ENHANCEMENT

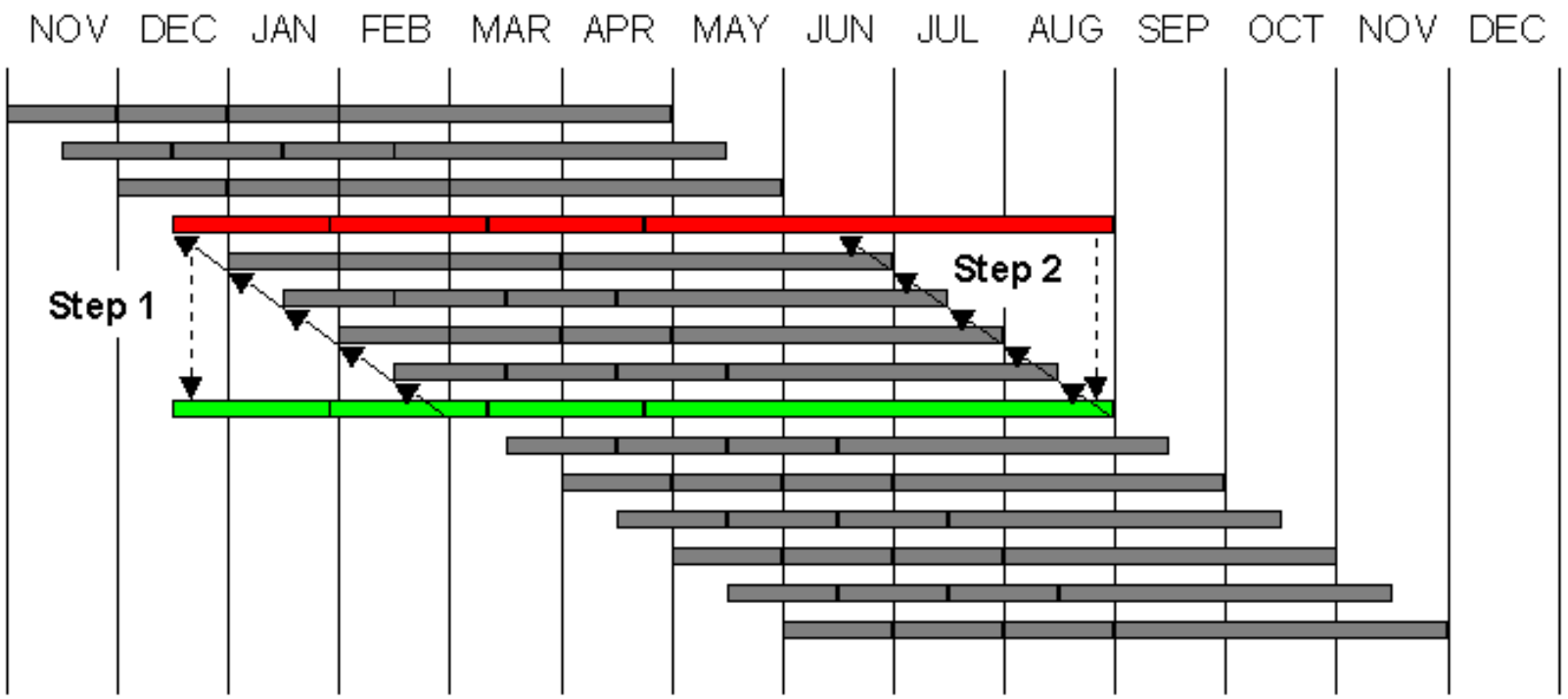


Program(me) Management

- The coordinated management of a portfolio of projects to achieve a set of business objectives (CCTA 1995)



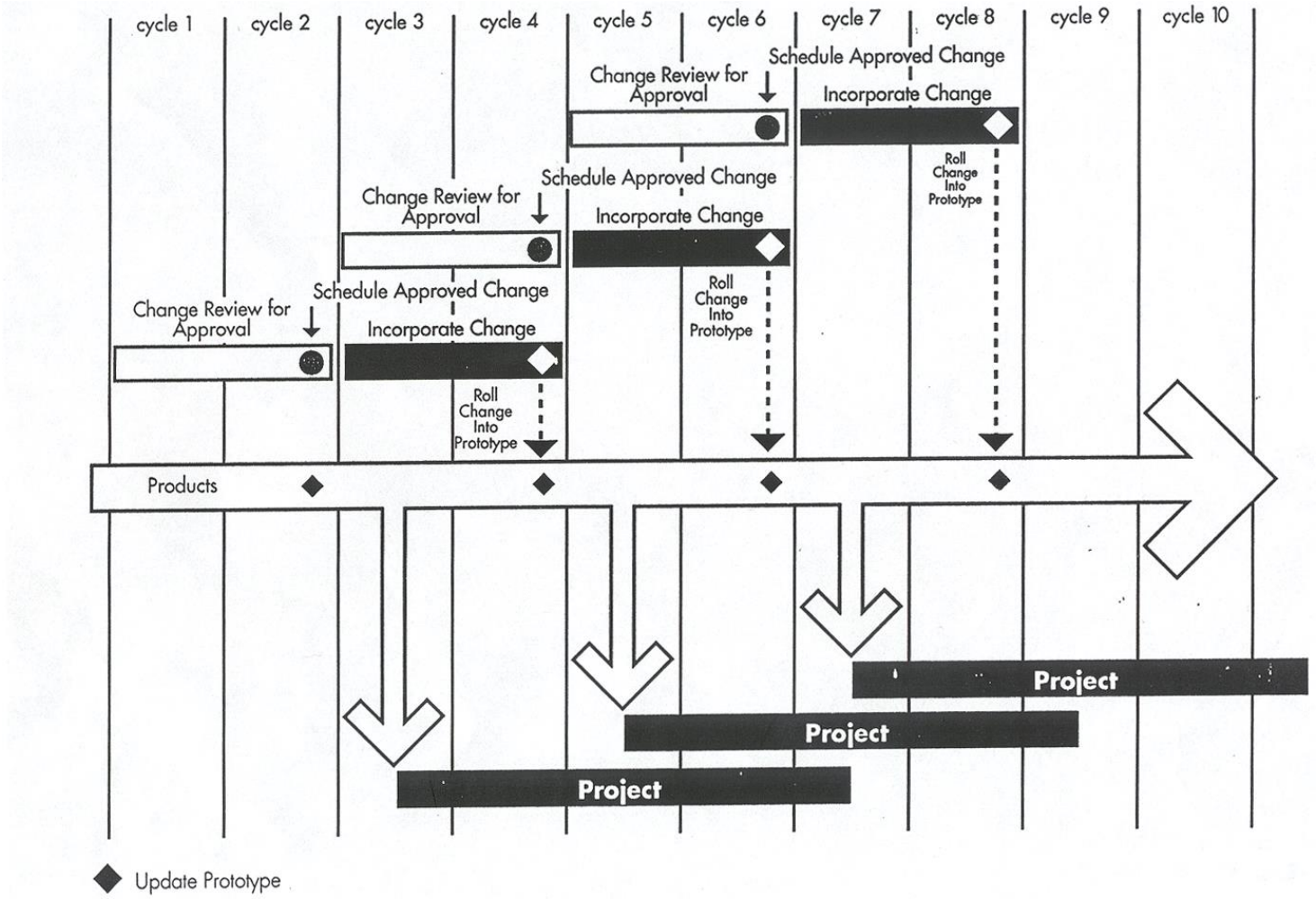
Project ‘Fallout’ Buffer



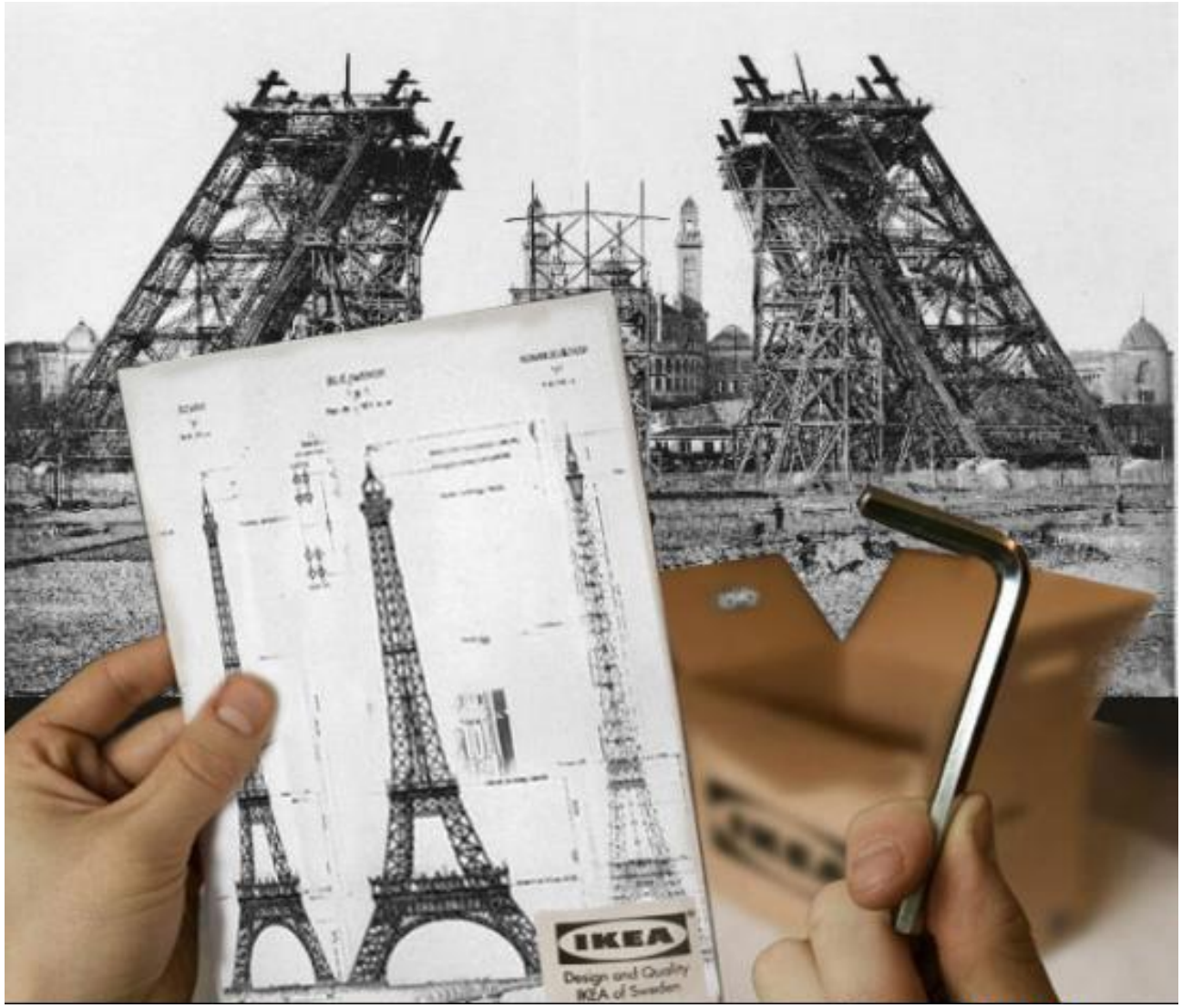
- Project “Fallout” Buffer
  - Easier to Gain 2 Weeks on 4 Projects than 10 Weeks on 1 Project

Programmatic Change Management

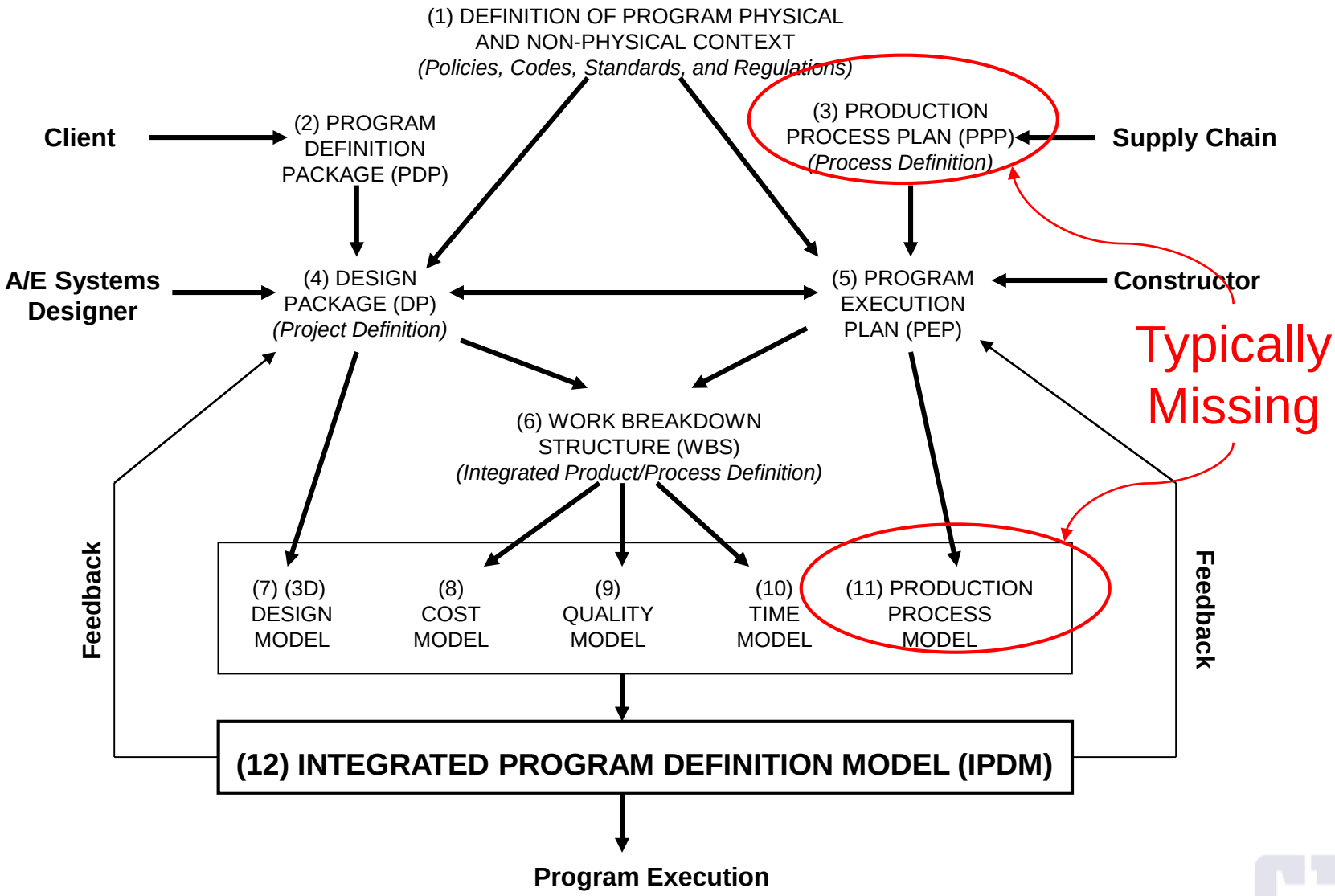
- Change Management System
  - Wal-Mart makes 170 changes per month to Supercenter prototype



Advanced Work Packaging?

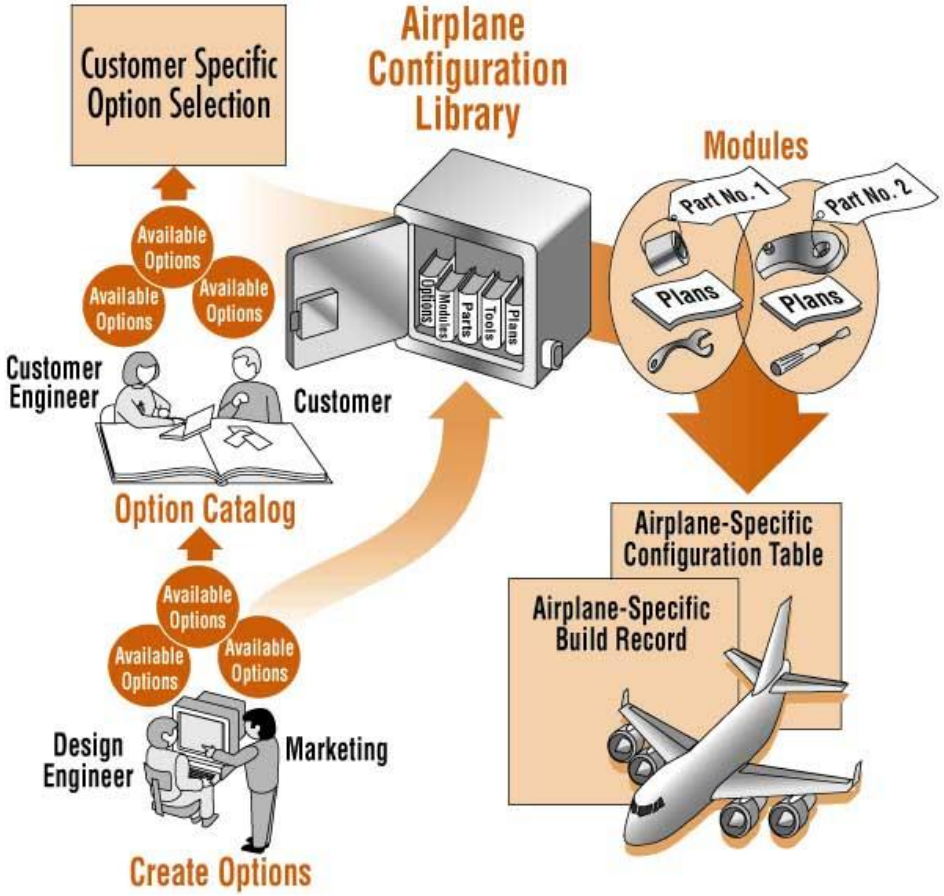


Production Work Order (PWO) System



Advanced Work Packaging?

Advanced Work Packaging!

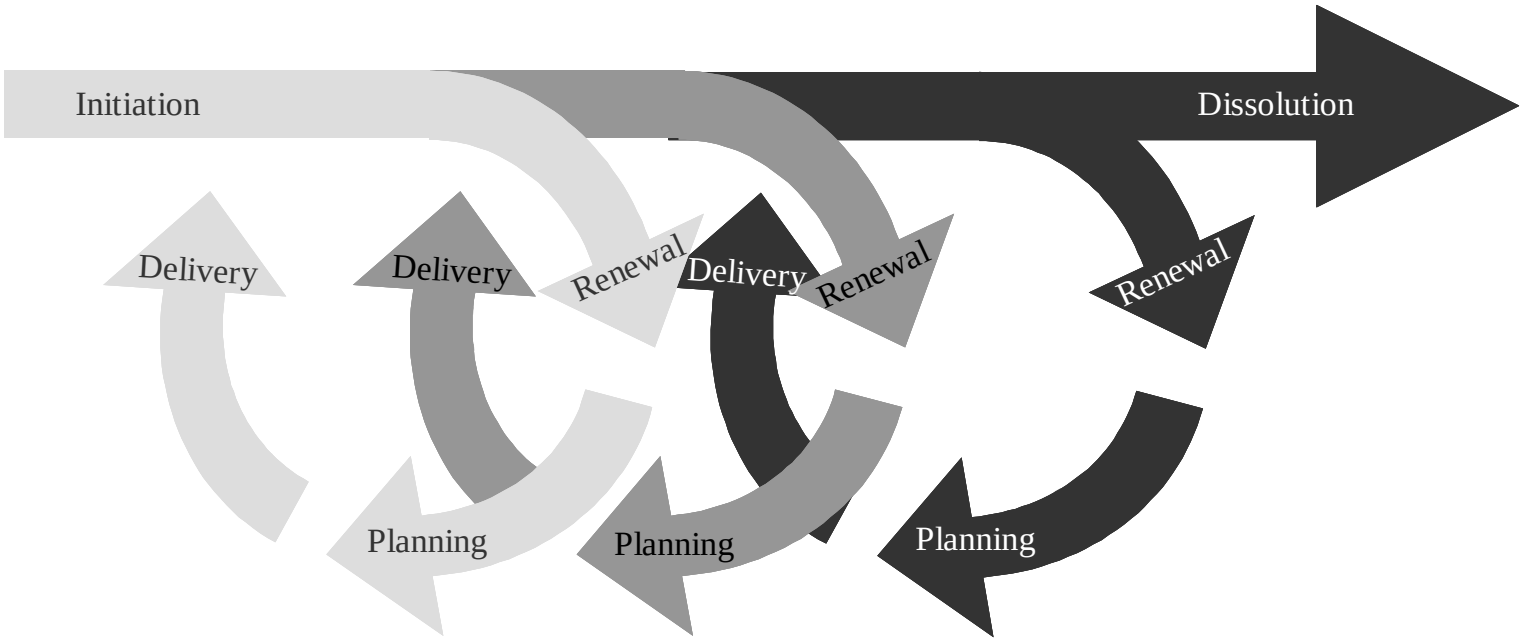


Benefits: Linking Business and Project Management (after Reiss 1996)

- Direct
  - Projects with direct benefits
- Enabling
  - Projects vital to the delivery of a whole range of benefits from other projects
- Passenger
  - Projects that can only add to benefits expected from other projects
- Synergistic
  - Projects which makes no (or only a small) contribution, unless combined into a program

Program Renewal

- The Program Continuum (after Pellegrinelli 1997)
  - Initiation, Planning, Delivery, Renewal
  - New ‘class’ of dynamically-benchmarked ADP’s

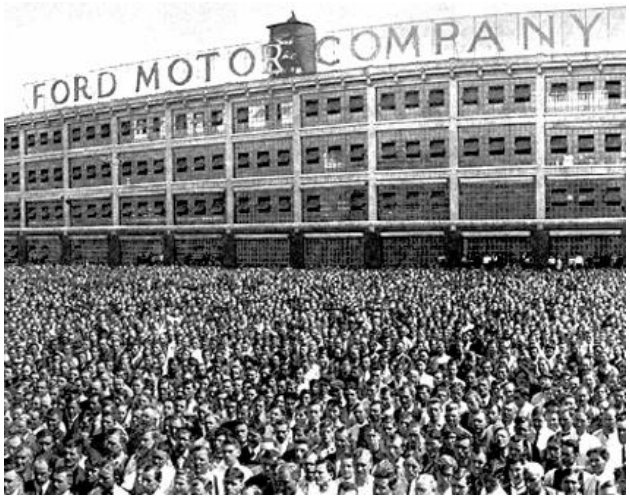


Study and Findings

- 3 Large Building Program Owners
  - 167 Combined Projects
  - Executed Using Program Renewal
- Boeing – 11% Project Development Cost Reduction

Program	No. Projects Completed	% Projects Cancelled	% Cost Improvement
1996 Restaurant	24	10.5%	12.1%
1997 Restaurant	44	29.0%	4.9%
1998 Restaurant	17	38.5%	10.4%
1999 Restaurant	23	30.0%	5.9%
2000 Restaurant	32	33.3%	15.5%
1998 Hotel	13	9.1%	10.5%
1998 Discount Retailer	14	0.0%	9.5%

- Coming together is a beginning; keeping together is progress; working together is success
  - Henry Ford



Questions?

- www.10-10program.org
- www.construction-institute.org

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