PROJEKTE laufen selten wie geplant ab. Verzögerungen und Budgetüberschreitungen sind die Regel und nicht die Ausnahme; hinzukommt, dass der erwartete Wert oft nicht erreicht wird. Bauprojekte sind seit langem für ihre ungenügende Zielerreichung bekannt, aber heutzutage schneiden IT-Projekte noch schlechter ab.

DIE WELT verfügt über eine umfangreiche Literatur zum Projektmanagement, Systeme für seine Steuerung und über Berater, die bereitwillig helfen, aber es scheint, dass alles das ohne Wirkung auf die eigentlichen Ergebnisse des Projektes bleibt.

Aber warum?

SUCHE DAS KNOW-WHY und das Know-how wird von alleine kommen, sagt der Autor und ist dabei von Shigeo Shingo inspiriert, und er tut genau das. In diesem Buch legt er sein Verständnis für die Natur des Projektes dar und bietet eine neue Herangehensweise für dessen Management auf der Basis seiner Value-Flow-Operations Theorie, in einer leicht lesbaren und verständlichen –und oft unterhaltsamen– Form.

DAS BUCH IST EINE PIONIERARBEIT, in der der Autor seine eigene professionelle Projekterfahrung von mehr als fünfzig Jahren mit Inspirationen aus den verschiedensten Feldern wie Hydraulik, Theorie der komplexen Systeme und Chaos, sowie Sozialwissenschaften und Kriegswesen kombiniert und auch mit der Forschung in Lean Construction verknüpft.

IM GRUNDE HABEN WIR die wahre Natur des Projektes NICHT VERSTANDEN, ist seine provokative Hypothese, und deswegen gerät es so oft außer Kontrolle. Es ist die fundamentale Annahme, dass Alles geplant werden kann und die Pläne umgesetzt werden können, die wir aufgeben müssen. Pläne werden niemals ganz erfüllt, nicht weil das Planen schlecht war, sondern weil Pläne in der Realität niemals erfüllt werden können, ist seine provokative Aussage, bevor er eine Lean Herangehensweise für das Projektmanagement vorschlägt, eine Herangehensweise, die funktioniert!

9 783746 099330

SVEN BERTELSEN aps

Das Widerspenstige Projekt

SVEN BERTELSEN

SVEN BERTELSEN

DAS WIDER-SPENSTIGE PROJEKT

Ein neues Verständnis seiner Natur und Leitung

SVEN BERTELSEN aps

Glenn Ballard – a brief CV

- Previous Experience
  - Pipefitter, Foreman, Construction Engineer, Productivity & Quality Specialist, Internal Management Consultant for Brown & Root and Bechtel
  - Independent Management Consultant. Clients include Petroleos de Venezuela, U.S. Dept. of Energy, Pacific Gas & Electric, Koch Refining, BAA (Heathrow Terminal 5), Channel Tunnel Rail Link (St. Pancras Station), Aera Energy, & Hess Oil
- Current Position
  - Research Director, Project Production Systems Laboratory, UC Berkeley
- Education
  - M.B.A. (Production Management)
  - PhD (Civil Engineering)
- Co-founder
  - International Group for Lean Construction (1993)
  - Lean Construction Institute (1997)
  - Project Production Systems Laboratory (2005)

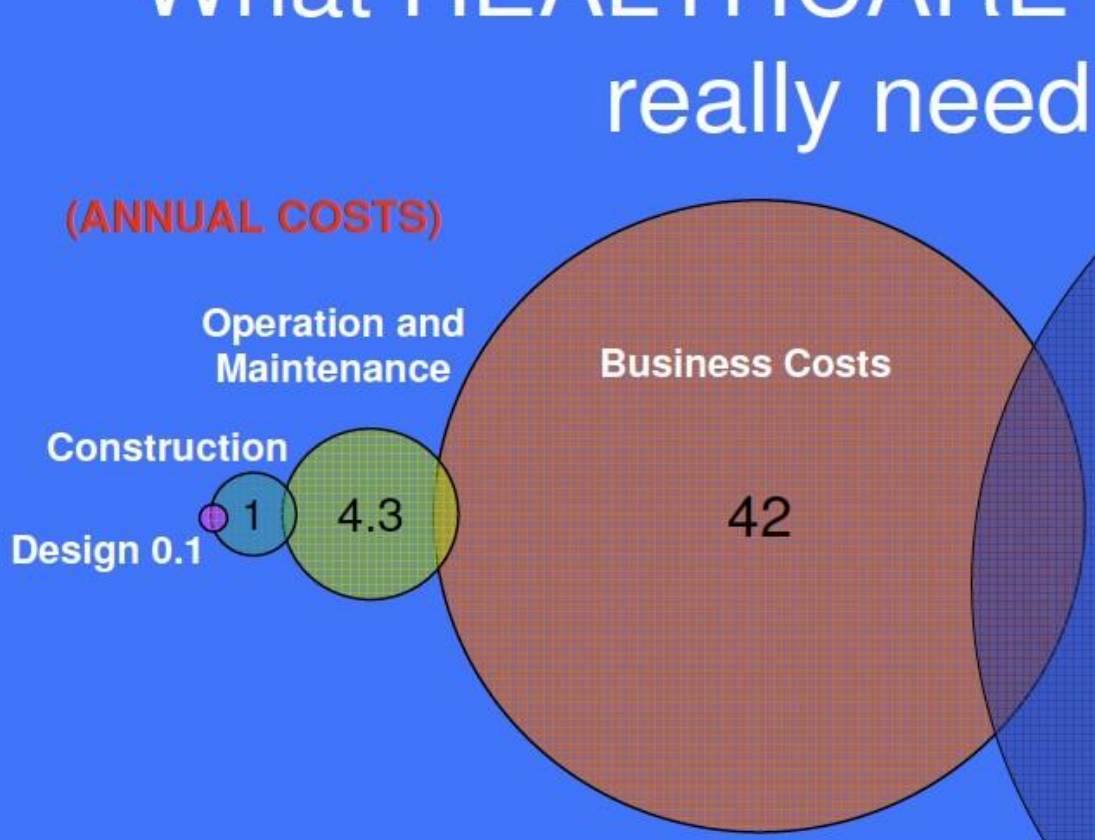
Target Value Delivery

Glenn Ballard

Munich

April 10, 2018

What HEALTHCARE customers really need



NHS Estates

Healthcare outcomes

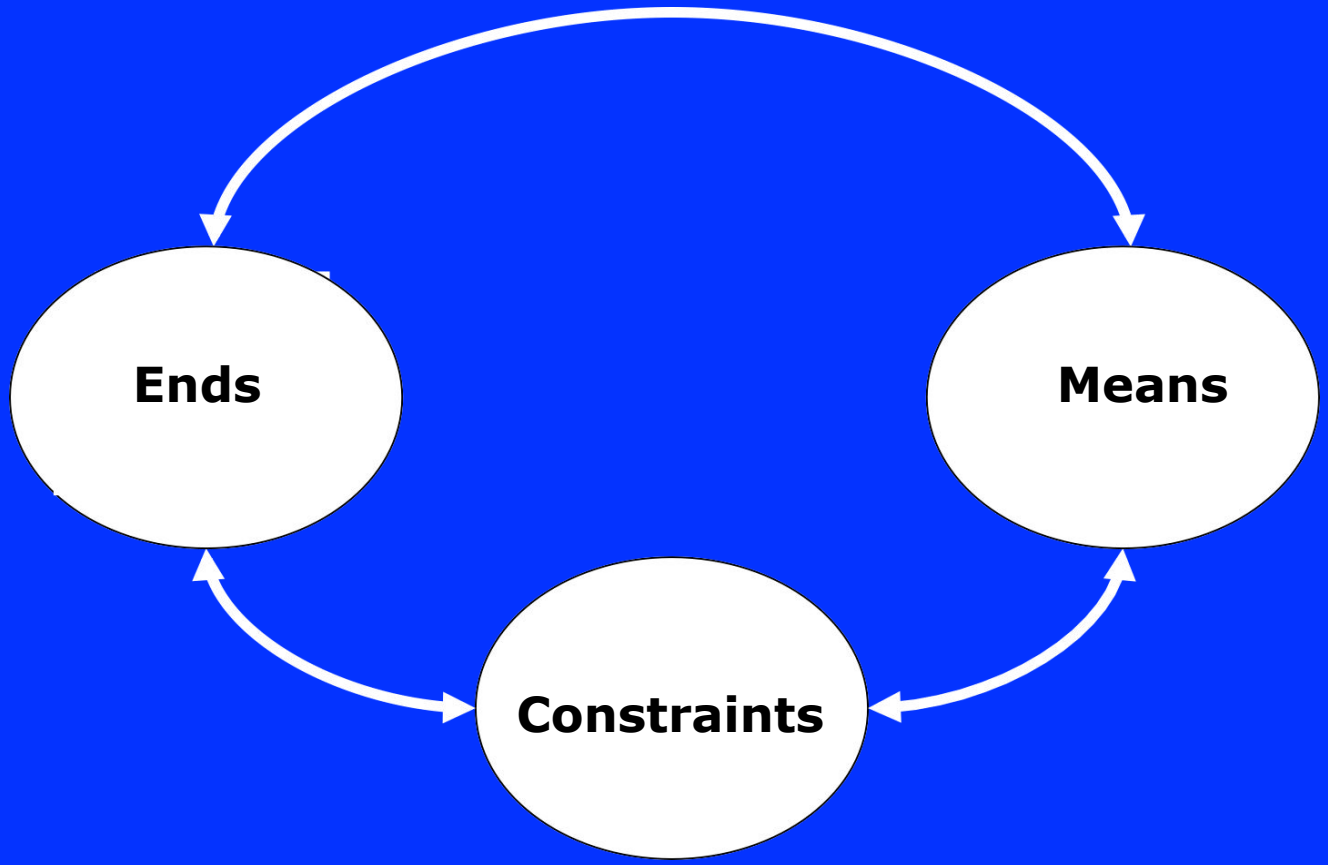
- Clinical outcomes
- Hospital-acquired infection rates
- Safety outcomes
- Medication error rates
- Medication rates
- Re-hospitalisation rates
- Length of stays
- Patient transfers
- Costs per unit of service
- Patient satisfaction
- Visitor satisfaction
- Staff morale
- Staff turnover

From Evans, et al. 1998

Key Points

- The natural target for built environment projects is to provide the customer acceptable net benefits in use of the constructed asset.
- Some corollaries:
  - Design for the whole life of constructed assets, including costs and benefits from using the asset.
  - Don't just do what customers ask. First help them understand what they want by revealing the consequences of their desires and by making them aware of alternatives they had not previously considered.

The Fundamental Alignment



Key Points

- The natural target for built environment projects is to provide the customer acceptable net benefits in use of the constructed asset.
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  - Design for the whole life of constructed assets, including costs and benefits from using the asset.
  - Don't just do what customers ask. First help them understand what they want by revealing the consequences of their desires and by making them aware of alternatives they had not previously considered.
  - The fundamental alignment needed in projects is between ends, means and constraints.

In moving from an idea to a go/no go decision, several key questions are asked and answered

A. What benefits are wanted?
B. What is the lowest acceptable ratio of benefits to costs? (allowable cost)
C. How does this project compare to others as an investment alternative?
D. Given the risks and uncertainties, can this project be completed successfully?
E. Answering those questions involves producing and assessing a business case, and identifying and assessing risks and opportunities in project delivery.

Customers are the decision makers, but design and construction professionals can help

Consider questions A and B above, which involve developing and assessing a business case. The allowable cost, what I am willing and able to pay to obtain the prospective benefits, is a function of the worth to the client of those benefits. Target value and target cost are indissolubly linked. The role of design and construction professionals at this point in the process is to help clients understand the consequences of their desires and to help them identify or generate alternatives means for achieving target value not yet considered. This is the role of trusted advisor.

Questions C and D are also interdependent. If the risk of successfully completing a project can be reduced, it becomes a more attractive investment. Engaging design and construction professionals in risk and opportunity assessment and strategies for risk mitigation and opportunity exploitation is the more needed as project complexity and uncertainty increase.

Target Value Delivery Process of Capital Projects

Develop project business plan

↓

Validate the project business plan

↓

Set targets for what's wanted and conditions of satisfaction

↓

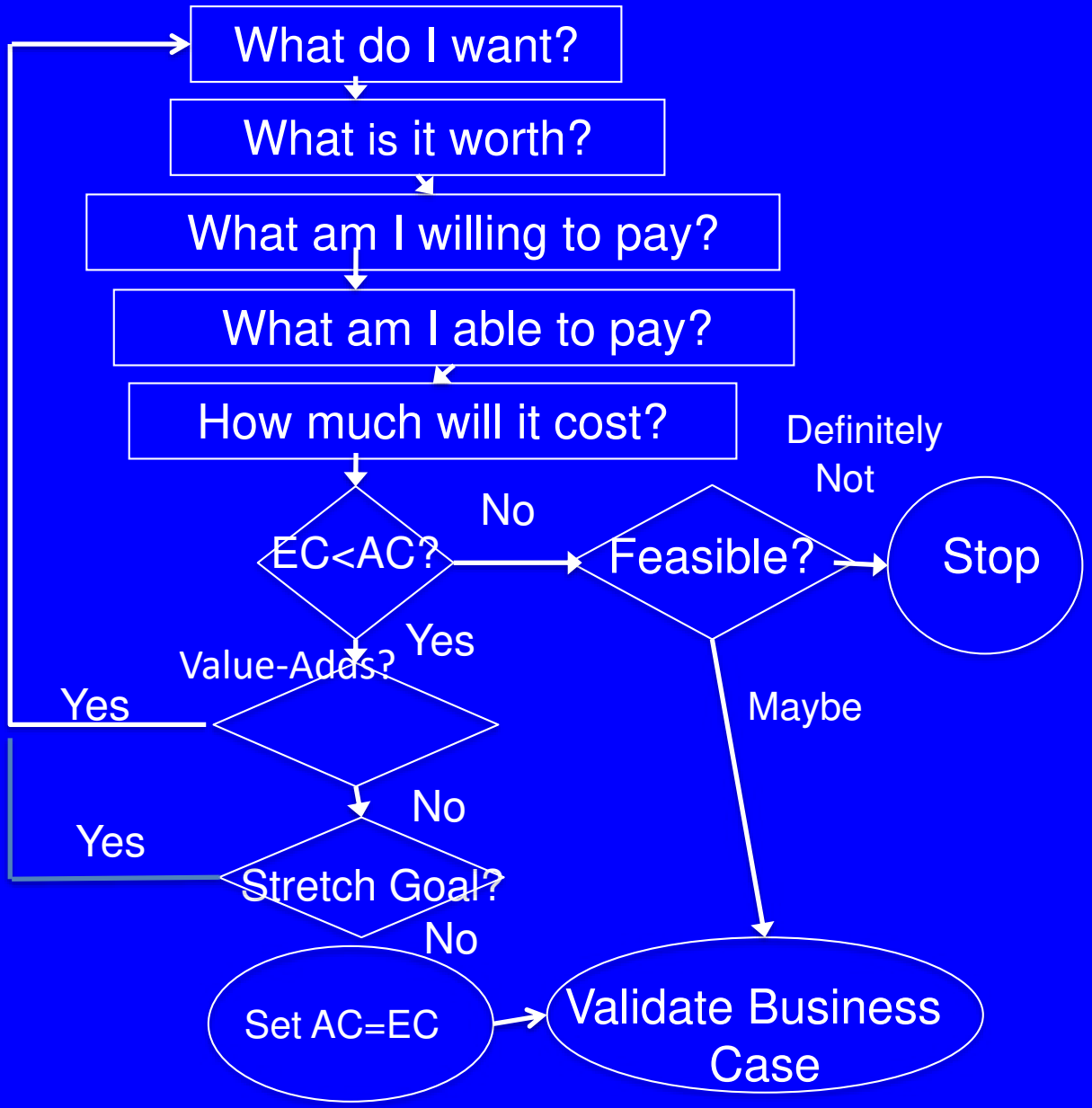
Steer design to targets

↓

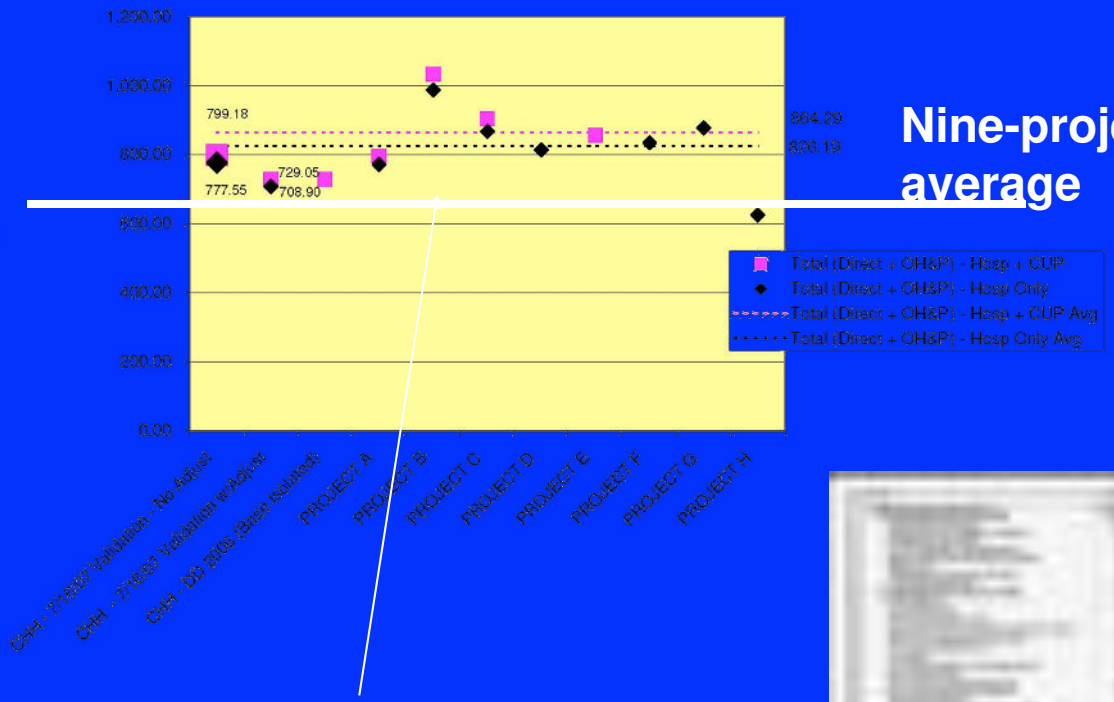
Steer construction to targets

Allowable Cost (AC): what I am willing and able to pay.

Expected Cost (EC): what it would cost based on the market.



Setting the target cost and project schedule



Nine-project marketplace average

Target set 14% ‘below’ marketplace

Accuracy of Conceptual Cost Estimates

Analysis of the most recent 26 Haahtela projects found an average difference of -1.98% between conceptual estimates and costs at completion, and a standard deviation of 3.82%.

Even one such example proves that greater accuracy is possible. But what contributes to accuracy of estimates?

Hypothesis to be tested: Not only the model and expertise in using the model, but also proactive steering of design and construction to targets for what customers value and the constraints on delivery of that value; principally, program, cost, location and time.

Haahtela's Cost Model

What is it?

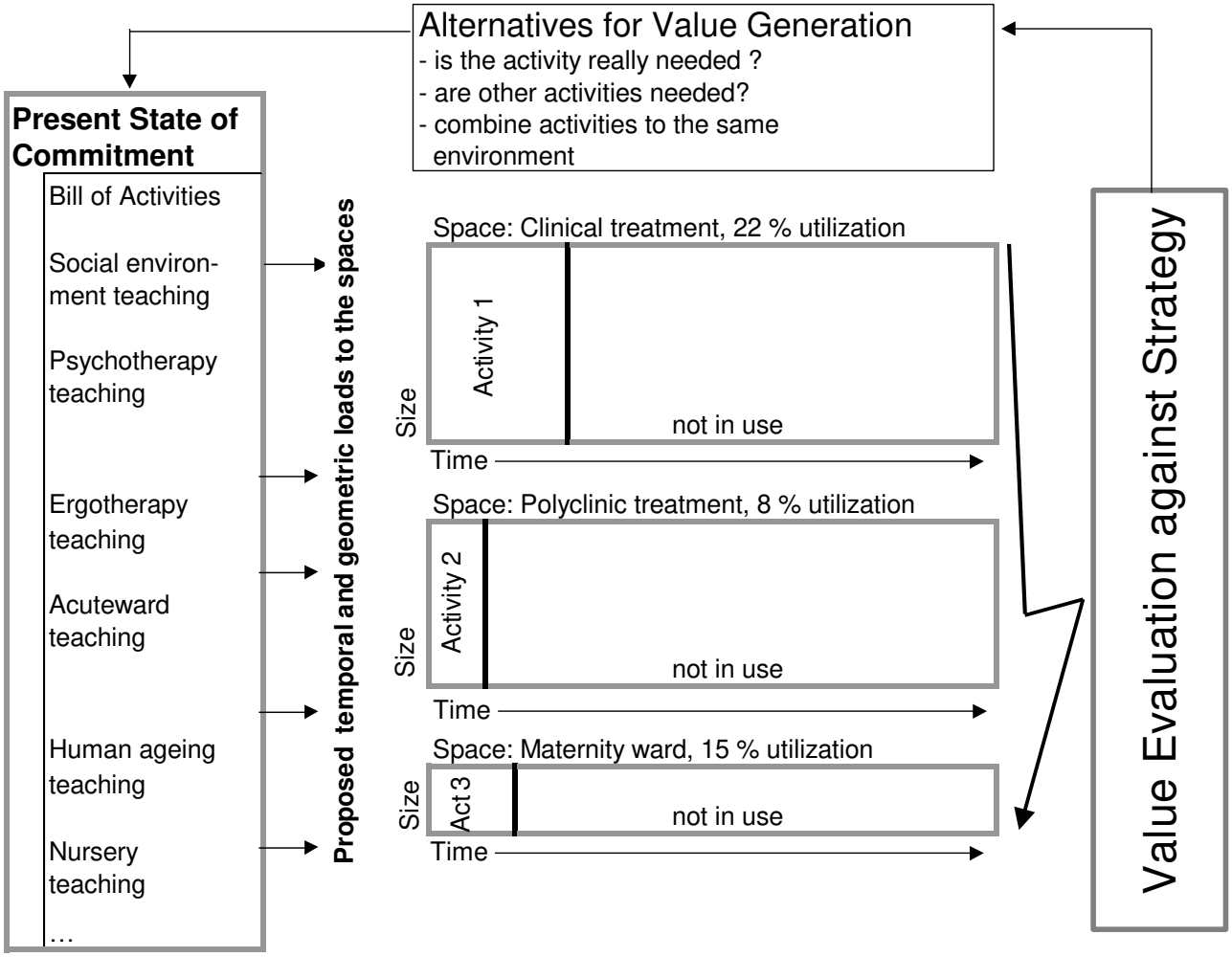
A machine for producing building information models that takes input from the voice of the customer and produces an estimated cost for what's wanted.

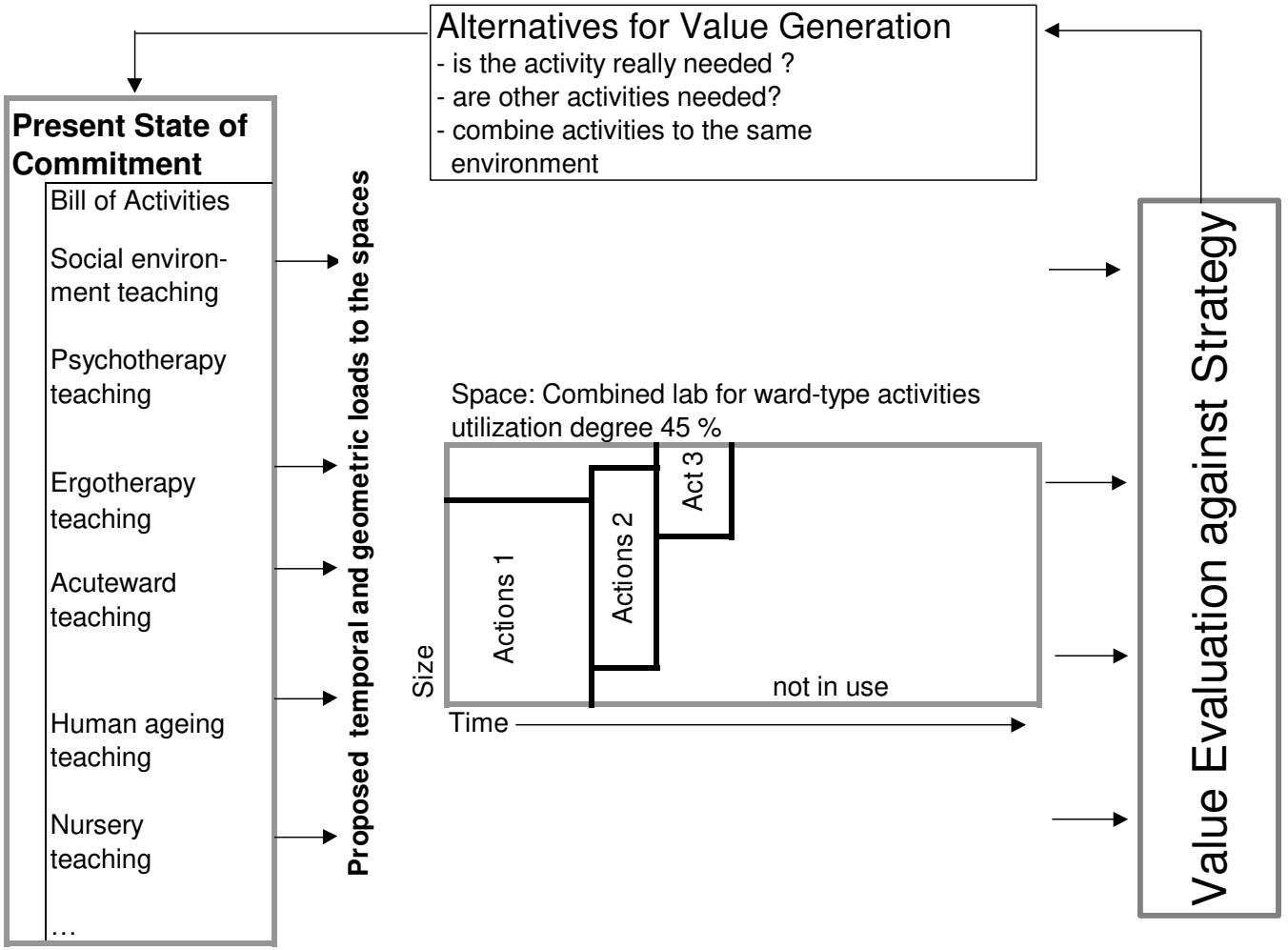
How does it work?

By embedding algorithms and formulas used by architects and engineers to move from 'I want to be able to hear a pin drop from any seat in the theater' to the costs of impacted components and systems. Change the requirement and the estimate changes accordingly.

How well does it work?

- Average cost at completion of 26 projects = 1.96% under the conceptual estimate.
- Standard deviation = 3.82%


Alternatives for Value Generation
- is the activity really needed ?
- are other activities needed?
- combine activities to the same environment
Present State of Commitment
Bill of Activities
Social environ-ment teaching
Psychotherapy teaching
Ergotherapy teaching
Acuteward teaching
Human ageing teaching
Nursery teaching
…
Proposed temporal and geometric loads to the spaces
Space: Clinical treatment, 22 % utilization
Activity 1
not in use
Size
Time
Space: Polyclinic treatment, 8 % utilization
Activity 2
not in use
Size
Time
Space: Maternity ward, 15 % utilization
Act 3
not in use
Size
Time
Value Evaluation against Strategy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- is the activity really needed ?
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- combine activities to the same environment
Present State of Commitment
Bill of Activities
Social environ-ment teaching
Psychotherapy teaching
Ergotherapy teaching
Acuteward teaching
Human ageing teaching
Nursery teaching
…
Proposed temporal and geometric loads to the spaces
Space: Combined lab for ward-type activities
utilization degree 45 %
Act 3
Actions 2
Actions 1
Size
not in use
Time
Value Evaluation against Strategy

Target costing information model

Same information as design uses

Number of luminaries needed is based on illuminance required

N= ExA/(FxnxUfxMf)
where
E is illuminance required
A is size of the space
F is efficiency of the lamp
n is number of lamps in the luminaire
Uf is a certain factor (dealing with the absorption of surfaces)
Mf is a factor (dealing with probability that lamps work)

It is not necessary to produce first a design solution to count out the number of luminaries (or size of main switchboard, or…) as the designers use the same formula to determine the number of luminaries

Target costing information model

Same information as design uses

Number of lifts needed and performance of the lifts is based on waiting time

Round-Trip Time= Travel time + Stopping time + Transfer time
Travel time = (2 x Storeys x height of the floor) / Velocity
Stopping time = etc

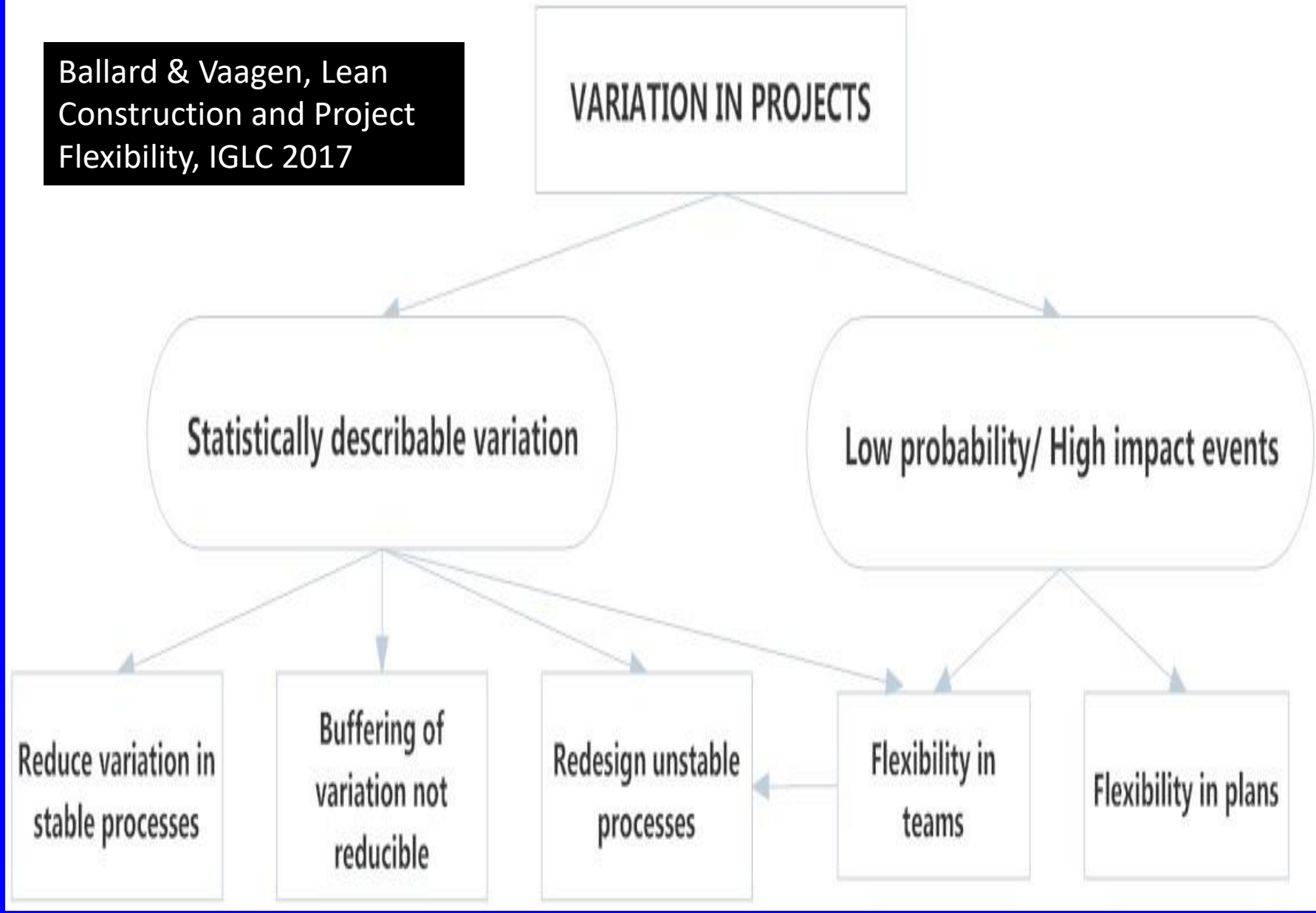
Waiting time = (Round trip time) / (2*number of lifts)

Recommended waiting intervals
-Offices 30 sec
-Hotels 60 sec
-etc

Assessing Risks & Opportunities

- It is equally important to identify and assess risks and opportunities.
- Traditionally, risks are assessed by multiplying probability of occurrence times estimated impact.
- That is problematic when probabilities are unknown and when impacts are catastrophic.

Ballard & Vaagen, Lean Construction and Project Flexibility, IGLC 2017



Increasing Flexibility in Plans is increased by:

- Postponement—e.g., planning in greater detail as time for execution draws nearer; making decisions at the last responsible moment
- Hedging--developing or buying an 'insurance' to offset potential losses or gains. Examples are:
  - *Set-based design* to develop a fallback alternative design in case it is needed to meet the Last Responsible Moment (Ward, et al., 1995).
  - By consolidating *negatively correlated activities*, flexibility and free hedging can be achieved (King and Wallace, 2012).

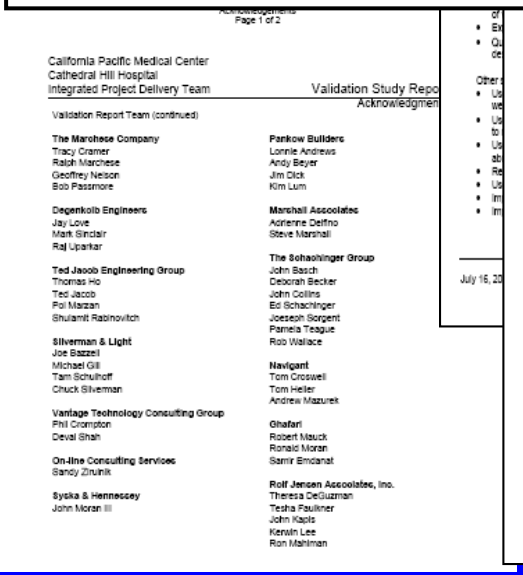
Flexibility in Teams is increased by:

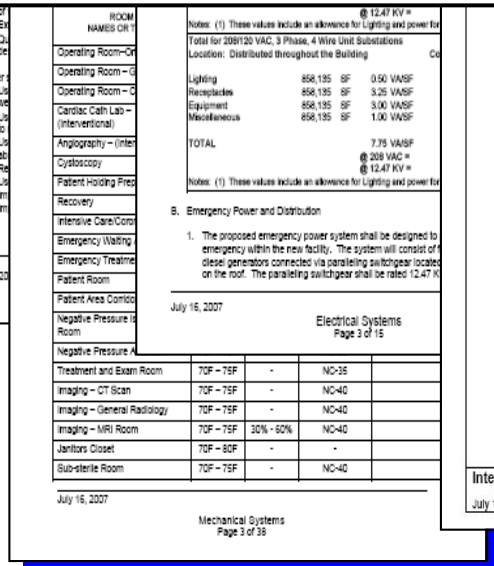
- promoting psychological safety; feeling safe to speak truth to power, to make suggestions, to request feedback, to expect help when mistakes are made, to perform experiments.
- cultivating the habits and skills of creating your own future—applying the Last Planner principle that work is planned by those who do the work.

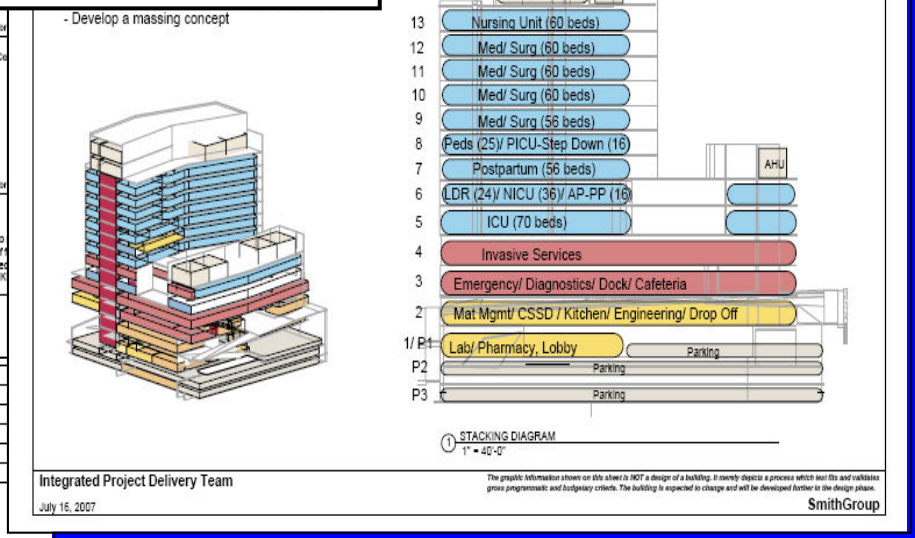
Validation Study

Basis of Design, Budget and Schedule.

The Starting Point for Designing to Targets

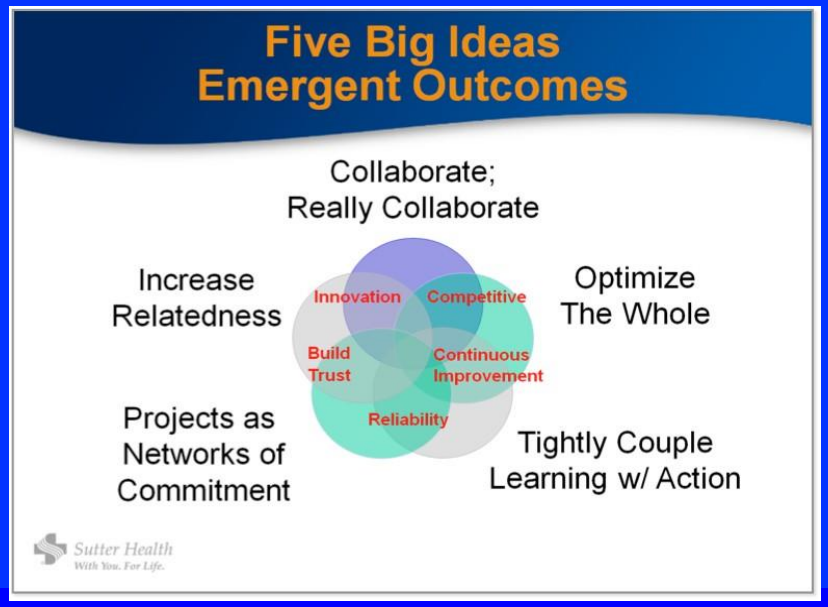






Steering Design to Targets

1. Allocate the target cost to systems, subsystems, components, …
2. Have cost modellers provide cost guidelines to designers up front, before design begins.
3. Incorporate value engineering/value management tools and techniques into the design process.
4. Use computer models to automate costing to the extent feasible.



Target Cost Model

Legend:	Const TOTAL per SF	D-B TOTAL per SF
Worth (Target)		
Current Estimate	89.33	94.12

Project: Fieldhouse Expansion
Location: St. Olaf College Northfield MN
Phase of Design: Schematic Target
Date: June 21, 2001

Construction	+	Owner Reserves	+	Escalation	=	Construction TOTAL	Design-Build TOTAL
9,840,302		343,115				10,183,417	10,729,883

Incl Design at $504,886+41600

NOTES:
Bldg. Type: Recreational
Target (SQFT): 114,000
Floors: Single story plus mezzanines

SITE WORK	BUILDING	SHELL	INTERIOR	MECHANICAL	ELECTRICAL	SPECIAL	GENERAL
594,500	9,245,802	4,334,488	1,710,386	1,111,402	794,890	706,862	587,774
Site GC OH&P							
G10 Site Prep. Demo & Excav		A10 Foundation A20 Basement	C10 Interior Construction	D20 Plumbing	D5010 Service and Distribution	E10 Specialties & Equipment	Z1010 Project Administration
146,500		1,006,004	528,427	85,927	739,390	492,534	
G20 Site Improvements		B10 Superstructure	C20 Stairs	D30 HVAC	D5020 Lighting & Branch Wiring	E20 Furnishings Fixed/Movable	Z1030 General Conditions
373,000		1,218,797	62,639	824,160		34,000	
G30+40 All Utilities		B20 Exterior Closure	C30 Interior Finishes	D40 Fire Protection	D5030 Security Comm/Data	F10 Special Construction	Z1060 Fee
75,000		2,007,061	1,069,320	109,740		89,520	
G90 Other Site Structures		B30 Roofing	D10 Conveying	Testing and Special Mech	D5090 Other Electrical	F20 Selective Demolition	Z20 Risk and Contingency
		102,626	50,000	91,575	55,500	90,808	587,774

Sutter Medical Center Castro Valley

Target Value Design

Tuesday, January 11, 11

Construction Budget Summary

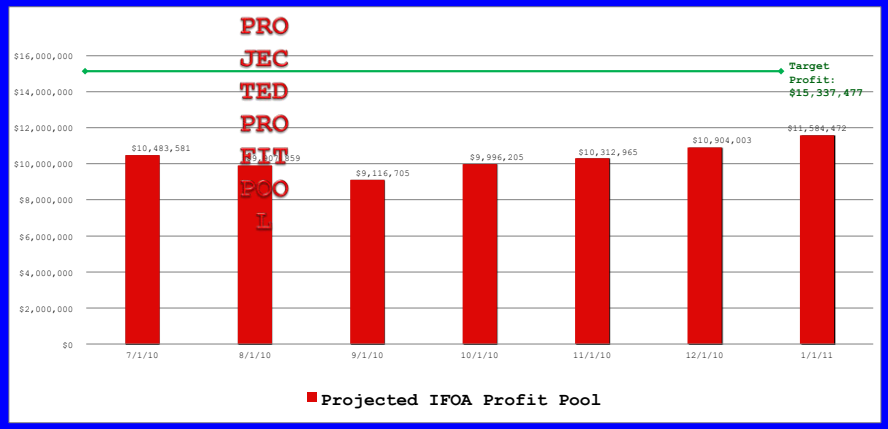
Original EMP: $228,197,957
Preliminary Change Orders: $4,923,778
Total Projected EMP: $233,121,735

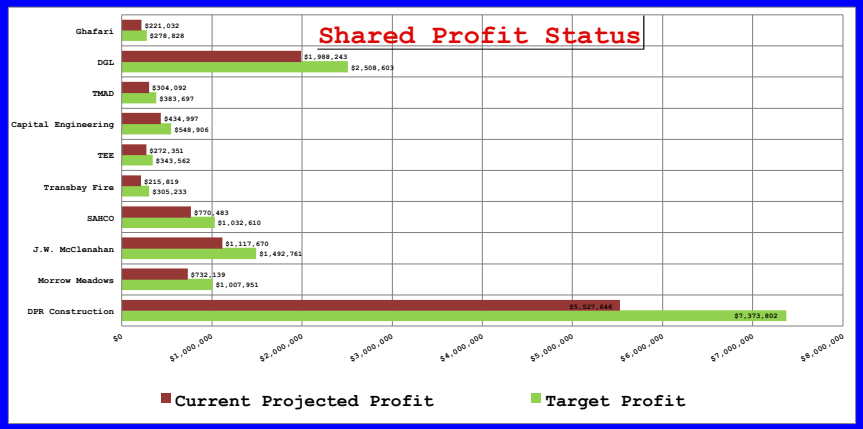
Total Projected Actual Cost *: $221,537,265
Total Assessed Cost of Risk (incl. in above): ($55,750)

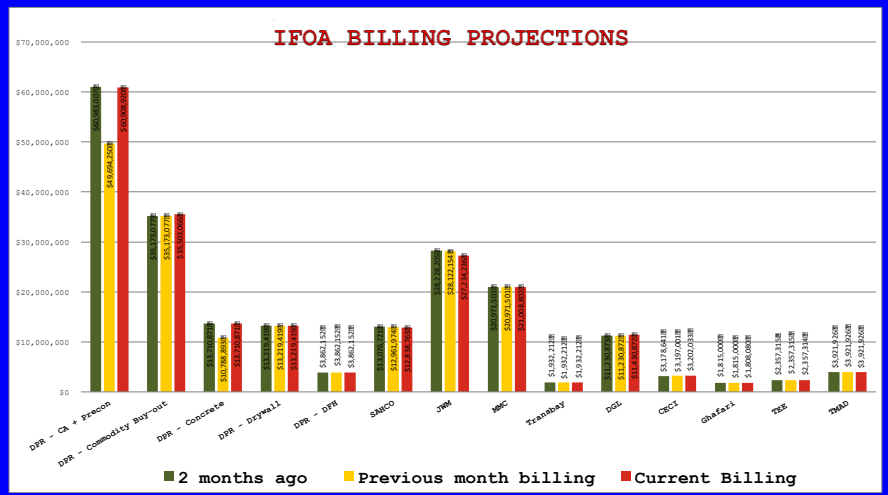
Total Target Profit: $15,337,477
Current Projected Profit: $11,584,472

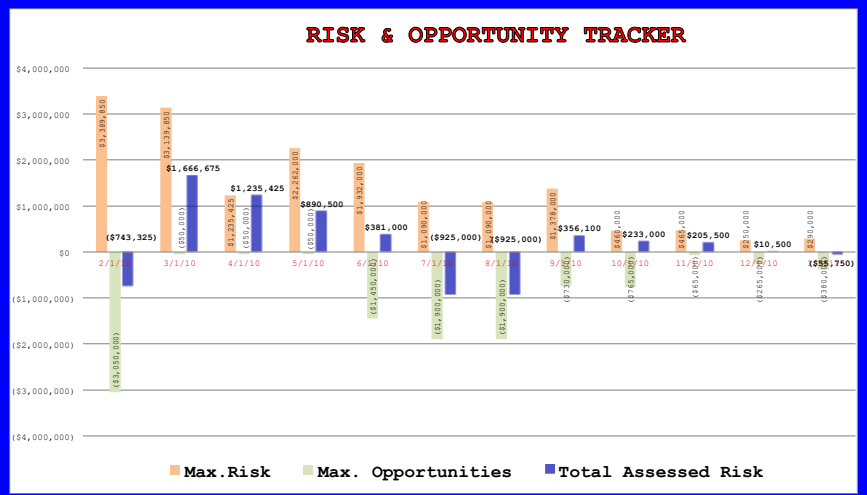
TOTAL COST REDUCTION REQUIRED TO REACH PROFIT GOAL:

$3,753,005

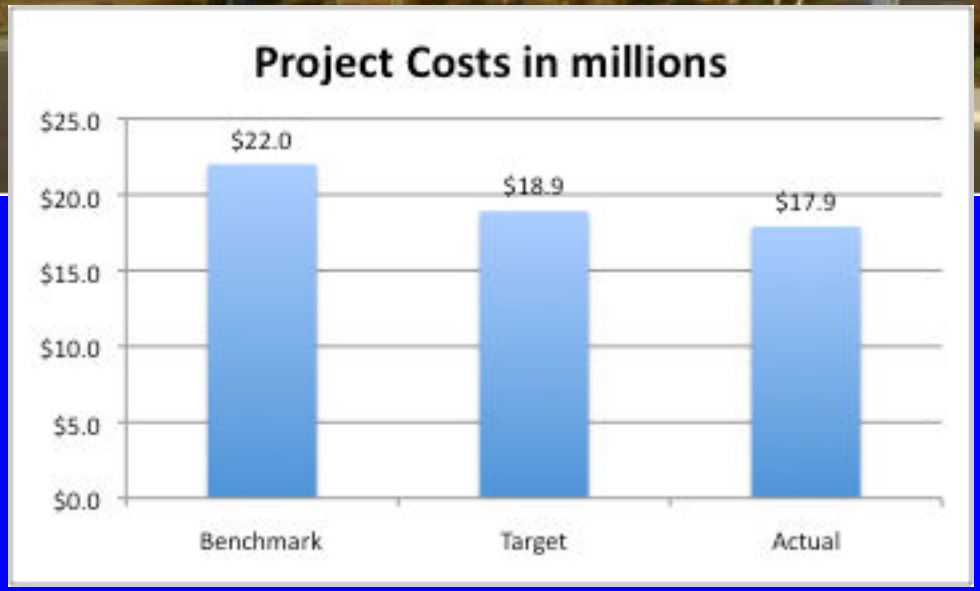








Sutter Fairfield Medical Office Building



Cost at completion was 5.2% below target and 18.6% below market

Sutter Health's 2012 Report

- Since they launched lean in 2004, Sutter Health had completed 22 'lean' projects > $10 million, some much larger.
- "Lean" mainly referred to use of target value delivery and last planner
- None over budget or time
- All 'fit for purpose'
- Average 3.4% under budget
- Average 15% under market

Questions I tried to answer

- What is Target Value Delivery?
- How does Target Value Delivery work?
- How well does Target Value Delivery work?

I look forward to your comments and questions