

Cost Management INT-10

Managing cost, performance, and value

“If you can bear to hear the truth you’ ve spoken
Twisted by knaves to make a trap for fools,....”
-Rudyard Kipling, “If”

Acknowledgments

- ICEAA is indebted to TASC, Inc., for the development and maintenance of the Cost Estimating Body of Knowledge (CEBoK®)
 - ICEAA is also indebted to Technomics, Inc., for the independent review and maintenance of CEBoK®
- ICEAA is also indebted to the following individuals who have made significant contributions to the development, review, and maintenance of CostPROF and CEBoK®
- Module 16 Cost Management
 - Lead authors: Thomas D. Dauber, Christopher J. Leonetti, Travis C. Manning
 - Senior reviewers: Richard L. Coleman, Fred K. Blackburn
 - Reviewers: John W. Deem, Jessica L. Phillips
 - Managing editor: Peter J. Braxton



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16. *Cost Management*

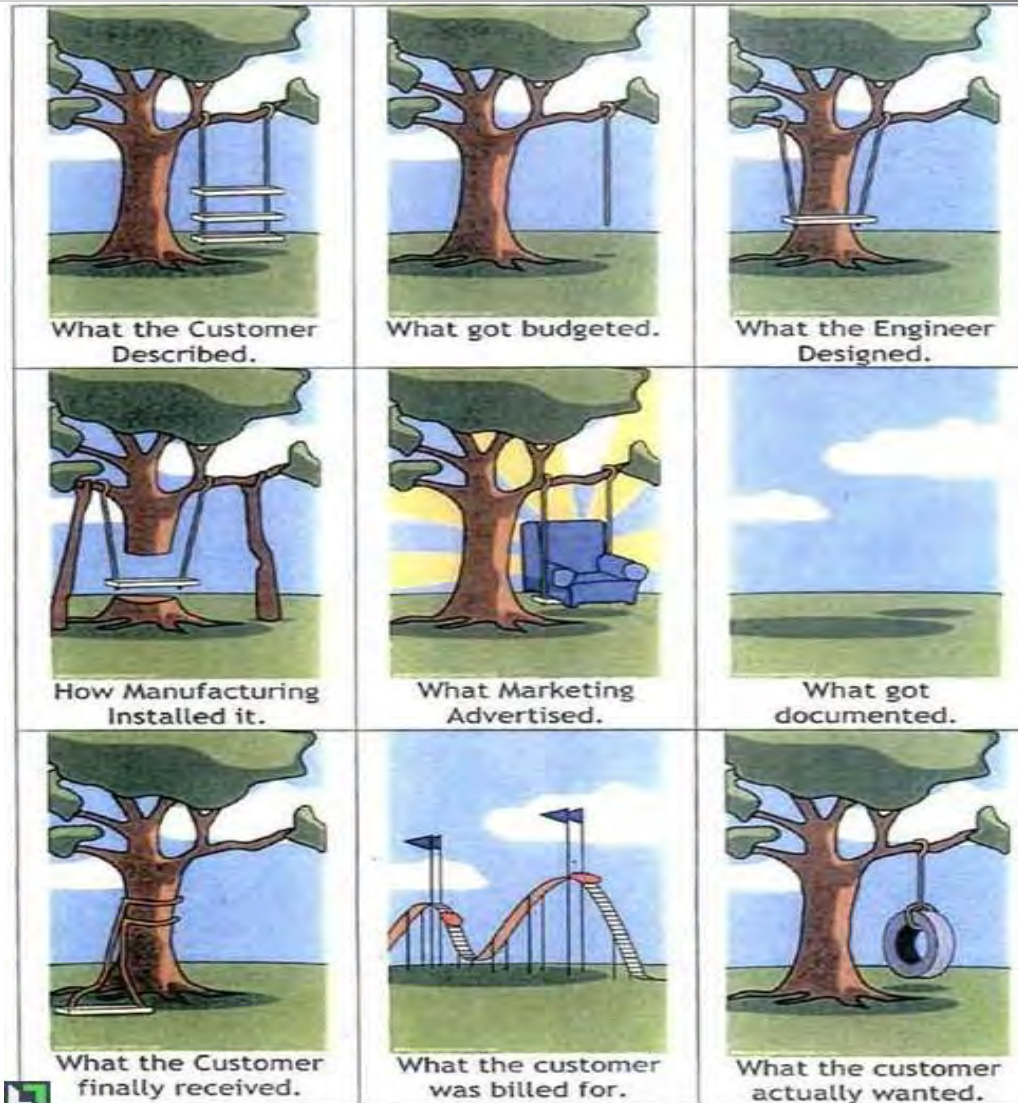
Quick Review



Cost Management Overview

- Key Ideas
 - Proactively managing costs
 - Cost estimating involved “early and often”
 - Improvements and trade-offs
 - Do Less, Do It Better, or Do It Differently
- Analytical Constructs
 - Linkage
 - Performance Estimating Relationships (PERs)
 - Utility Scores
 - Exchange Rate
 - Curves of Equal Preference
 - Trade Space
 - Extreme Cost Curves
- Practical Applications
 - Design Trade-offs
 - Cost Reduction Initiatives
- Related Topics
 - Government and Industry Improvement Initiatives
 - Decision Analysis
 - Management Accounting
 - Benchmarking

What we are trying to avoid



Cost Management Outline

- Core Knowledge
 - Introduction to Cost Management
 - Total Ownership Cost (TOC) **INT-11**
 - Cost As an Independent Variable (CAIV)
 - Target Costing **INT-11**
 - Activity-Based Costing (ABC) **INT-11**
- Summary
- Resources
- Related and Advanced Topics

Why Are We Here?

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- “Capstone” module
 - Coming full circle, revisiting the fundamental motivations for cost estimating and analysis
- Context for cost estimating and analysis
 - Handful of principles and techniques applied in a myriad of different contexts
- Cost and Decision-Making
 - We seek systematic, rational decisions involving cost, though these are all but impossible
- Cost and Efficiency
 - Cost is the ultimate measuring stick for various improvement initiatives
 - Avoid “squeezing the balloon”

Introduction to Cost Management

- Impetus for Cost Management
- Definition of Cost Management
- Objectives of Cost Management
- Methodologies and Tools

Impetus for Cost Management

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- Organizations challenged with need to reduce cost structures and to increase value in their products and services
 - Increased global competition requiring higher quality products at lower cost
 - Competition also increased within defense industry, including government's demand for cost containment and higher quality products
- Cost Management is understanding and selecting the improvement “tool box”

Definition of Cost Management



- Cost management:

- Planning, controlling, motivating, and evaluating the products, processes, and personnel
- Technique to provide information to help organizations produce profitable, functional services or products
- Identifies the cost of resources consumed, determines efficiency and effectiveness, and identifies and evaluates new activities that can improve future performance

Objectives of Cost Management

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- Assists effective and rational managerial decisions
 - Ensures life cycle costs are adequately considered
- Addresses wide spectrum of design and development issues to reduce life cycle costs
 - Issues need to be considered throughout development and acquisition of systems
- Designed to bring about reductions in system and equipment costs
 - Costs can be reduced through changes in Product or Process

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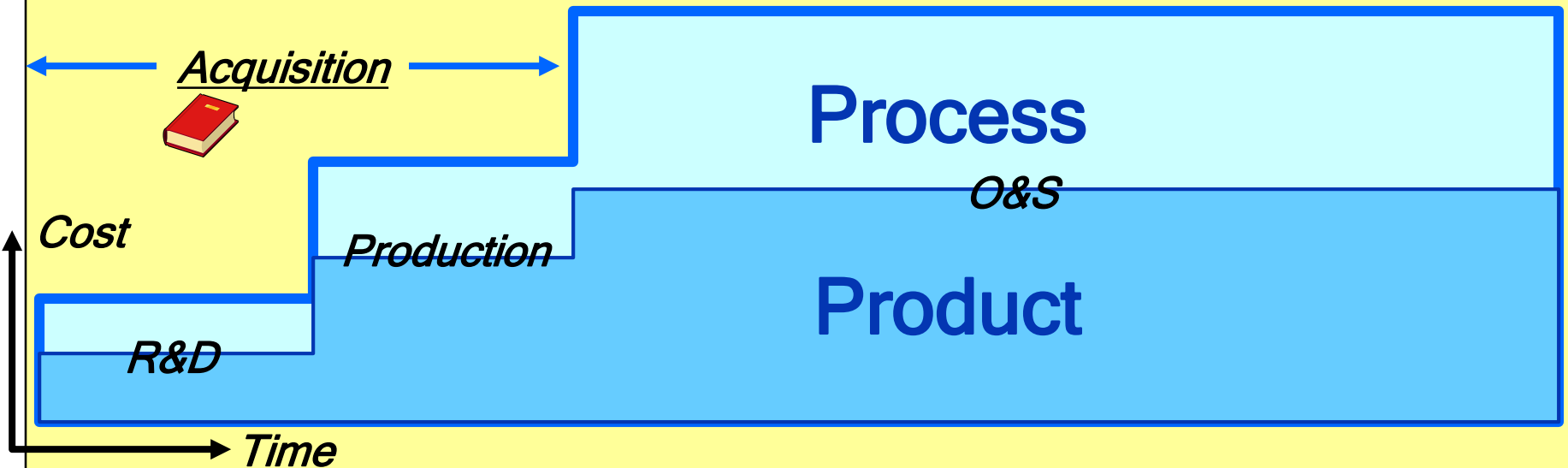
The ultimate goal of cost management is to achieve system and program affordability



Cost Management - Domain of Application

v1.2

← Cost Management addresses Process & Product throughout the Life Cycle →



How To Make Things Cheaper

- Do Less
 - No one wants to give up performance
- Do It Better
 - No one will argue with increased efficiency or other improvements
- Do It Differently
 - Everybody's looking for the "silver bullet" that will bring increased performance at reduced cost

"Better, Faster, Cheaper"

Methodologies and Tools

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- Methodologies discussed herein:
 - Cost As an Independent Variable (CAIV)
 - Target Costing
 - Activity-Based Costing (ABC)
- Cost management can be related to a host of other supporting methodologies, tools, and initiatives
 - Government and industry perspectives follow
- Cost estimating and analysis is an essential component



Warning: Cost estimating cannot successfully lead these initiatives!

Government Perspective

Life Cycle Support





- Performance-Based Logistics (PBL) 
- Total Life Cycle Systems Management
- Defense Industrial Base

Acquisition


- Earned Value Management 
- CAIV
- Simulation-Based Acquisition (SBA) 

COST MANAGEMENT

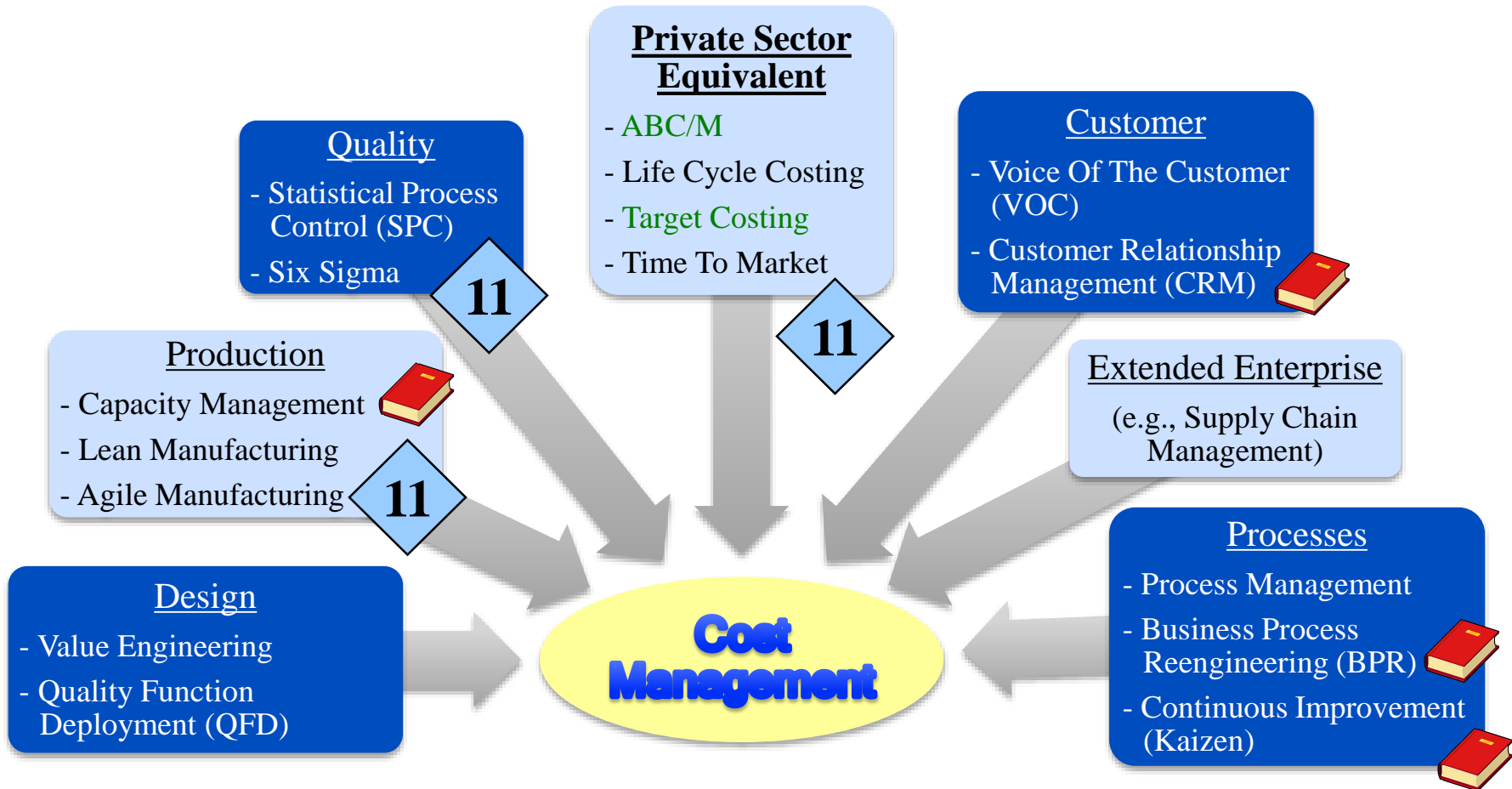
System Design

- Open Systems Architecture (OSA) 
- Commercial Off-The-Shelf (COTS) Technology 
- Affordability Through Commonality (ATC) 
- Reform of Specifications and Standards
- Concurrent Engineering and Supportability Analysis (CESA) 
- Integrated Product and Process Development (IPPD)

Business Processes

- Activity-Based Costing and Management (ABC/M) 
- Performance and contract incentives
- Outsourcing or Right-sourcing (A-76 studies)

Industry Perspective



Retro Initiatives

- Various improvement initiatives come and go, and usually come again
 - Often in new guises
 - Cf. Cloud Computing (aka Client-Server, SOA, SaaS, etc.)
- CAIV, TOC/R-TOC, Nunn-McCurdy, WSARA, Efficiency Agenda, etc.

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“There’s nothing new under the sun....”
-Ecclesiastes

Cost As an Independent Variable (CAIV)

- CAIV Definition
- Cost/Performance Trades
- Should Cost
- Role of Cost Estimating

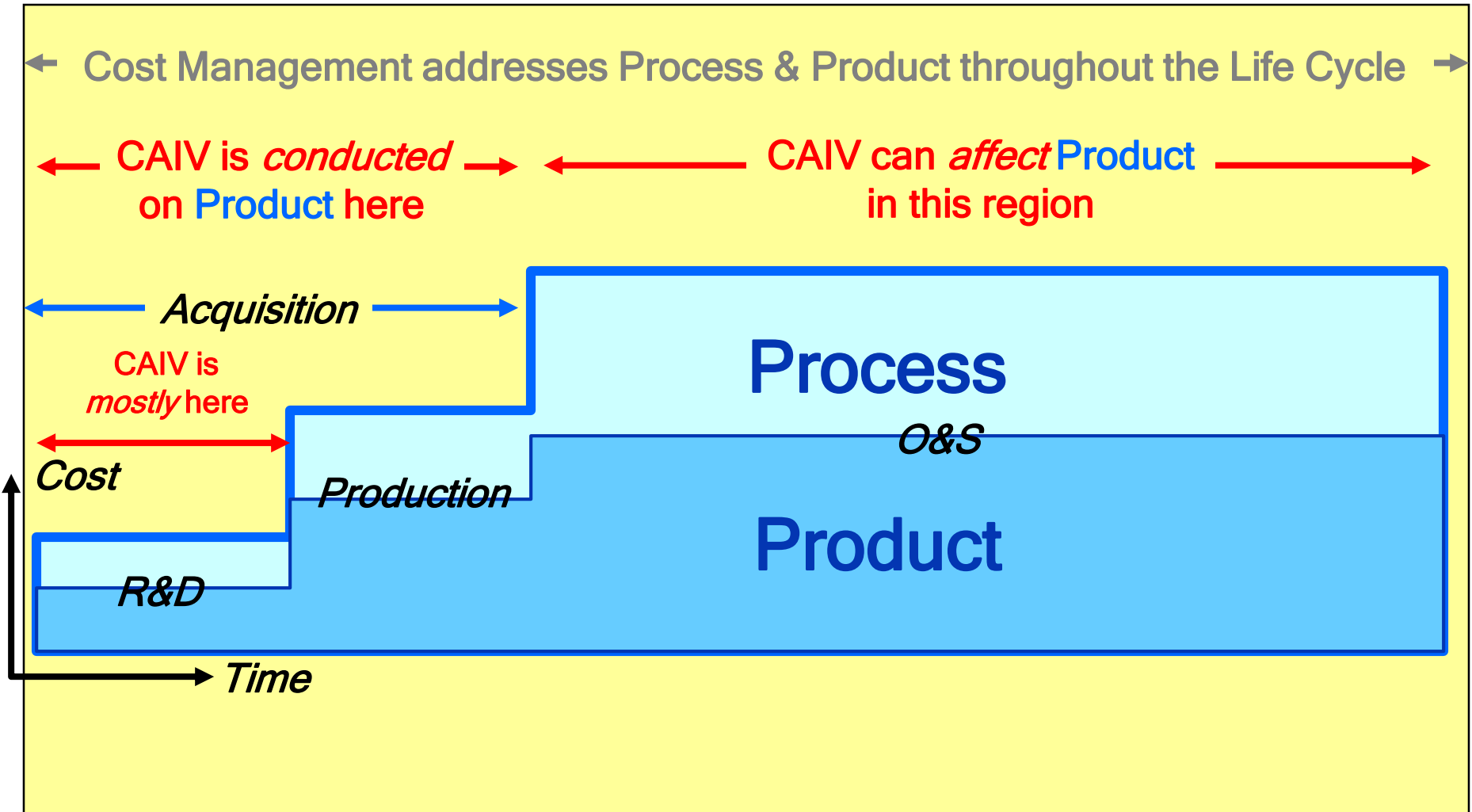


CAIV Definition

1

- Primary acquisition process and strategy for meeting requirements while reducing TOC
 - Using better business practices
 - Allowing trade space for industry to meet user requirements
 - Considering operations and maintenance costs early in requirements definition
- Entails setting cost objectives and managing achievement of these objectives
- Objectives must balance mission needs with resources

CAIV - Domain of Application



C...AIV

Cost...

- The C stands for Cost -- This refers to “Little TOC” or Life Cycle Cost (LCC)
- Remember to take into account the entire LCC when conducting CAIV trades
- CAIV trades make cost estimating and analysis more important
 - Traditionally neglected costs such as O&S and indirect costs require more attention
 - To facilitate CAIV trades, cost models must be related to relevant design parameters

...As an Independent Variable

- Captures the essential idea that cost must now be an input to the design process, not an output
- “An” is an important reminder that cost is only one consideration, along with performance and schedule
 - Risk will affect all three
- “Independent Variable,” is used in the graphical sense - The x-axis is the controlled variable, the input to the equation
 - Not asserting that cost is *statistically* independent of design!

CAIV Paradigms

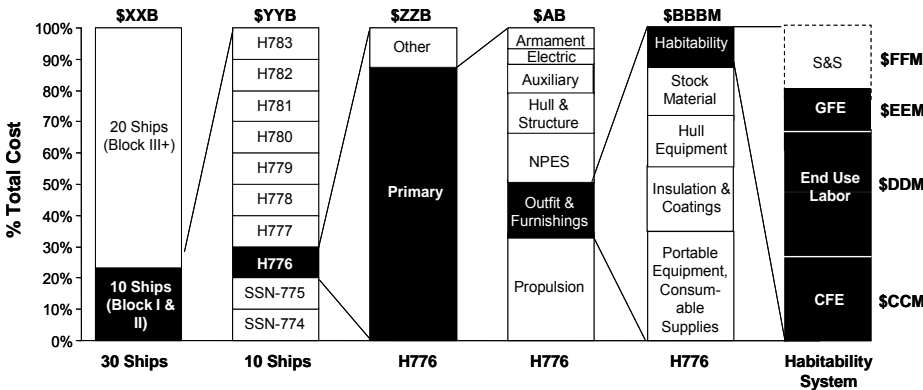
- The Old Paradigm
 - Desired performance and schedule for the system were specified, determining cost
- The Paradigm Shift
 - With a strict affordability constraint, system can be sub-optimized
- The New Optimum
 - Correct application of CAIV arrives at an acceptable balance between cost, schedule, and performance up front

Design for Affordability: US Navy's VIRGINIA Class submarine

Client Challenges

- ▶ VIRGINIA-Class nation's only production nuclear submarine (joint production by Electric Boat and Northrop Grumman)
- ▶ First ship in this 30+ ship class launched in 2004 at a cost of over \$3.2B (FY05\$) against a goal of \$2B (CNO target reduction mandate)
- ▶ Limited experience developing investment business cases
- ▶ Program needed to justify accelerating its build rate
- ▶ Cost data for the program was decentralized and disparate

Design-Based Baseline



The Challenge to Booz Allen

- ▶ Tasked to identify acquisition cost reduction opportunities in all major departments including design, scheduling, sourcing, organizational structure, and labor efficiency
- ▶ Conducted over 50 cross-functional team meetings with suppliers, customers, and internal client staff to determine program strengths and weaknesses
- ▶ Generated cost and labor baselines for 12 major subsystems; baselines provided a unique look at cost drivers for CFE material and touch-labor
- ▶ Created roadmaps for each major subsystem to prioritize cost savings ideas as well as illustrate interdependencies between cost savings ideas
- ▶ Identified and prioritized tradeoffs between design changes and schedule improvements
- ▶ Advised client to on risk/reward for critical "make vs. buy" and sourcing decisions

Results

- ▶ 250 cost reduction ideas reduced acquisition by \$3.8B
- ▶ Construction time reduced from 84 to 60 months
- ▶ 5:1 return on the Navy's investment



CAIV and Target Costing

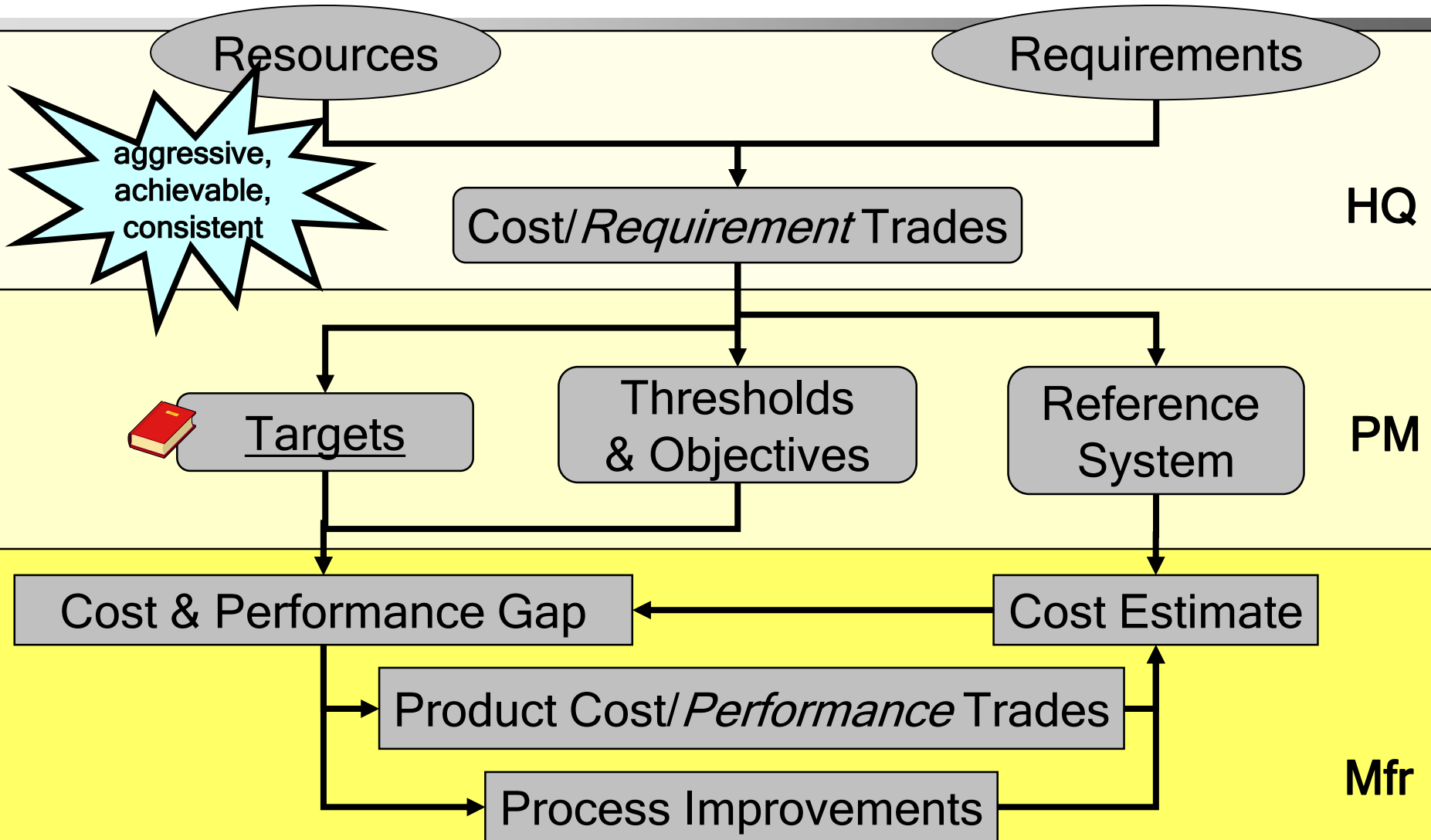
- CAIV is analogous to Target Costing (commercial practice)
 - Both are processes for reducing TOC
 - CAIV was developed at the same time American industry was becoming aware of Target Costing
- CAIV differs slightly from Target Costing
 - CAIV begins with Affordability Analysis
 - Target Costing begins with Market Analysis
- Understanding Target Costing is essential for practitioners of CAIV
 - Offers precedence and guidance in system deployment

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More on Target Costing later

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The CAIV Process



Decision Analysis Challenges

- There is a well-developed literature on decision analysis
 - *Decision Analysis* is a scholarly journal dedicated to advancing the theory, application, and teaching of all aspects of decision analysis

<http://da.journal.informs.org/>

http://en.wikipedia.org/wiki/Decision_analysis



- Systematic decision-making is seemingly straightforward but has a number of complicating factors:
 - Estimating costs for each alternative is hard
 - Quantifying risk and uncertainty for each alternative is even harder
 - Quantifying performance for each alternative is hard (e.g., sophisticated simulations)
 - There are multiple cost criteria (e.g., phases) and multiple performance criteria
 - There are multiple stakeholders/decision-makers
 - Conflating preferences can lead to problematic results




Kenneth Arrow, My Hero

- American neoclassical economist, youngest-ever recipient of the Nobel Prize in Economics (1972)
 - Won for proving there's no such thing as a fair election!
- Specifically, no positional (rank order) voting system can satisfy all the following desirable criteria:
 - **Unrestricted domain:** All preference orders are possible
 - **Unanimity:** If $X > Y$ for all individual voters, system must have $X > Y$
 - **Transitivity:** If $X > Y$ and $Y > Z$, then $X > Z$
 - **Freedom from Irrelevant Alternatives:** Preference between two candidates is not affected by inclusion or exclusion of a third
 - **Non-Dictatorship:** No single vote who determines group preference

http://en.wikipedia.org/wiki/Kenneth_Arrow, http://en.wikipedia.org/wiki/Arrow%27s_impossibility_theorem.

“When are people going to learn? Democracy doesn't work!”
-Homer Simpson

CAIV Trades


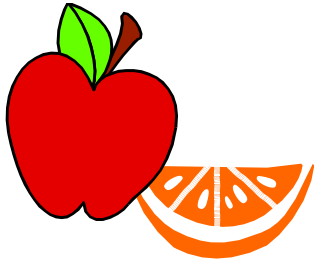
- CAIV focuses on cost/performance trade-offs 
 - Greatest leverage over life cycle costs exists early in design
 - Alternatives weighed early on with formal approach for trade-offs to be most effective
 - CAIV engages user, developer, and supporter to facilitate meaningful trade-offs
- Ordinary design requires trade-offs
 - CAIV requires trade-offs at an unprecedented level
- How can trades be done effectively and quickly?
 - What are the issues?
 - Are there techniques?
- But first, to review the requirement ...

Trades - Bounds and Timing

- Trade bounds:
 - Trades **between the Objective and Threshold** values are within the **purview of the PM**
 - Outside these values, they are the **purview of the MDA**
- Trade timing
 - Preparatory to a Milestone: **Cost/Requirement trades**
 - By the Government with Industry participation
 - During a phase: **Cost/Performance trades**
 - By the Prime with PM participation
 - These two trade types are similar in conduct, but can be thought of as first and second steps

DoD 5000.2 C1.3

Trade Challenges

- To trade cost and performance, the two must be compared in some common unit (commensurable) 
 - This is **often impossible** in military applications ... and is even hard in business ... value is **notoriously difficult** to determine
 - This problem is a classical issue in Operations Research
- As in the conduct of AoAs, the practice often is: 
 - To compare alternatives with one or the other fixed
 - To adjust one or the other variable to match in all of the alternatives
- There are a few basic methods
- *But ...* in difficult cases, military judgment may be necessary


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Trade Challenges - Bottom Line

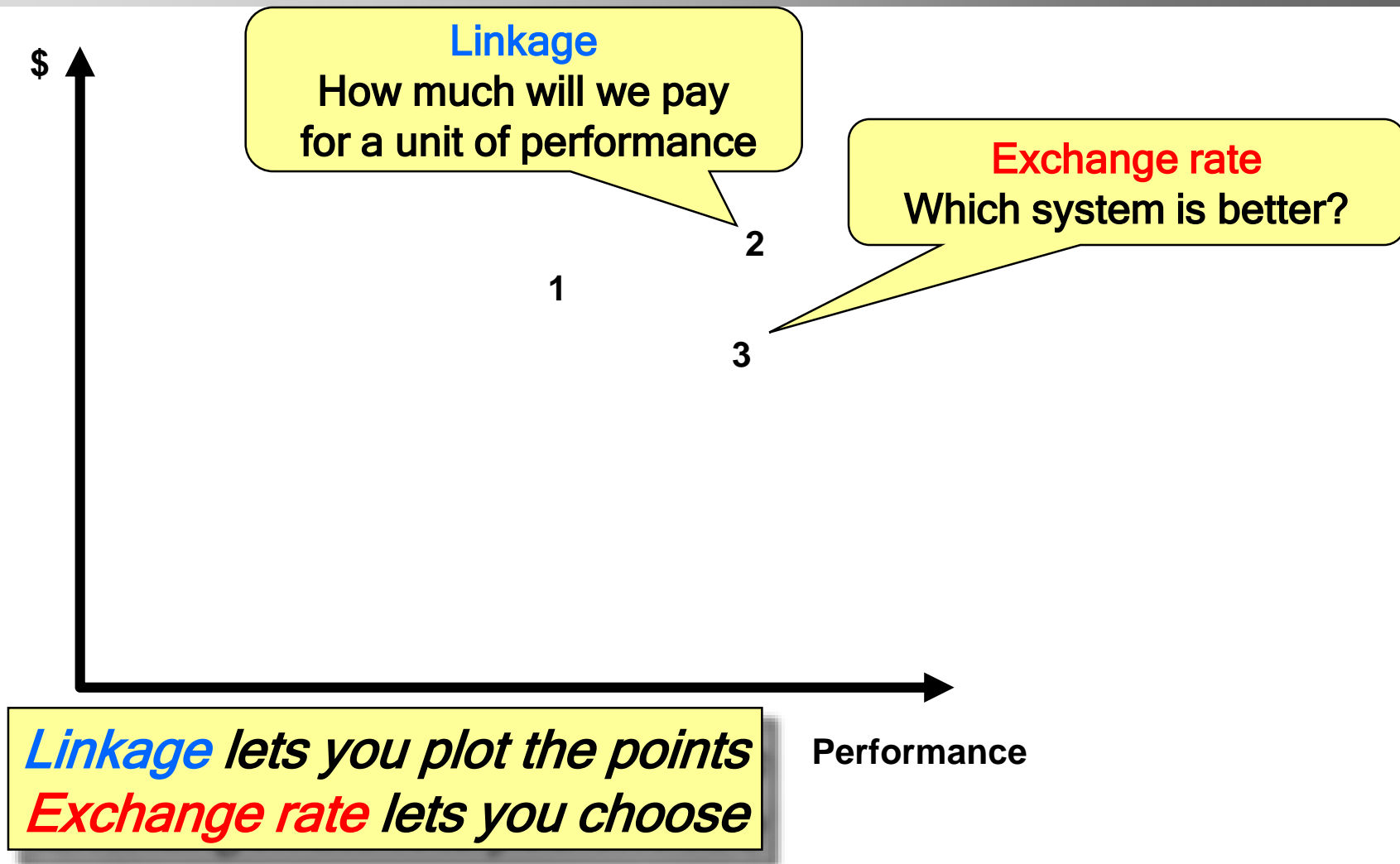


- “Linkage” - To trade, you must be able to show **cost for each alternative**
 - Some alternatives are hard to cost out
 - Costs don't change if CER input variables don't include the parameter you changed
 - Even if possible, the volume and speed of trades can make linkage hard



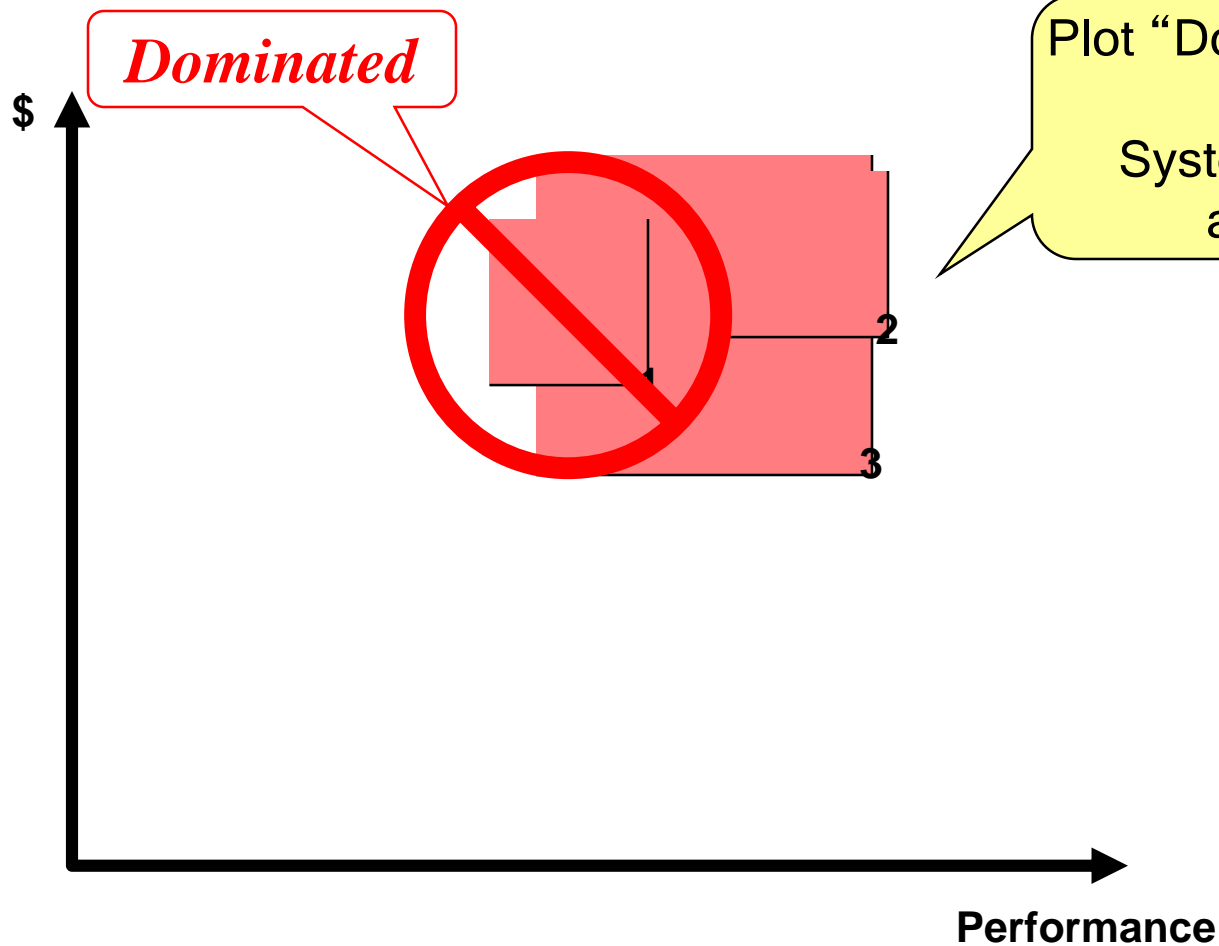
- “Exchange Rate” - To trade, you must know the **dollar value of performance** 
 - What is one knot of speed worth?
 - What is the dollar value of greater accuracy?

Linkage and Exchange Rate





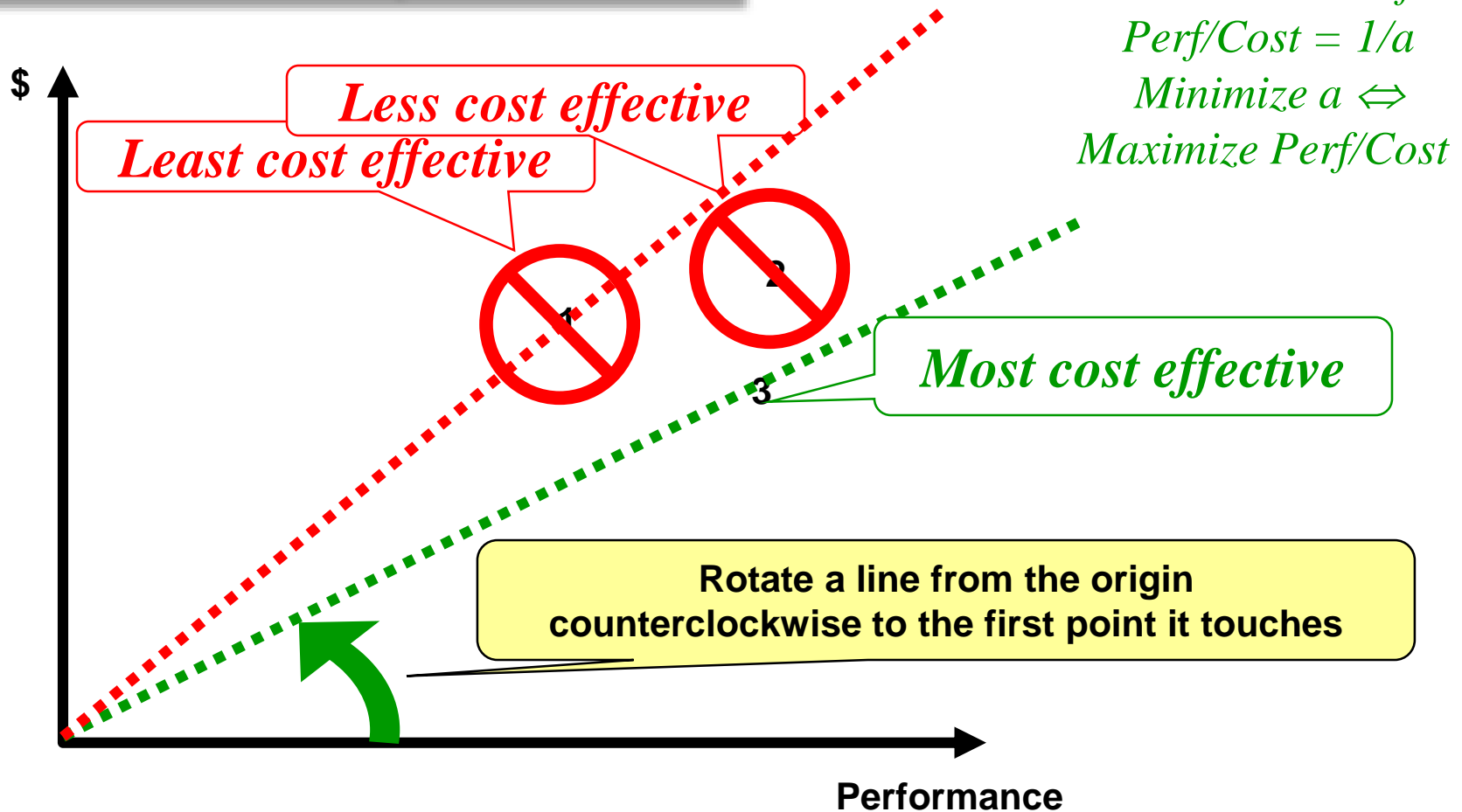
Strict Dominance



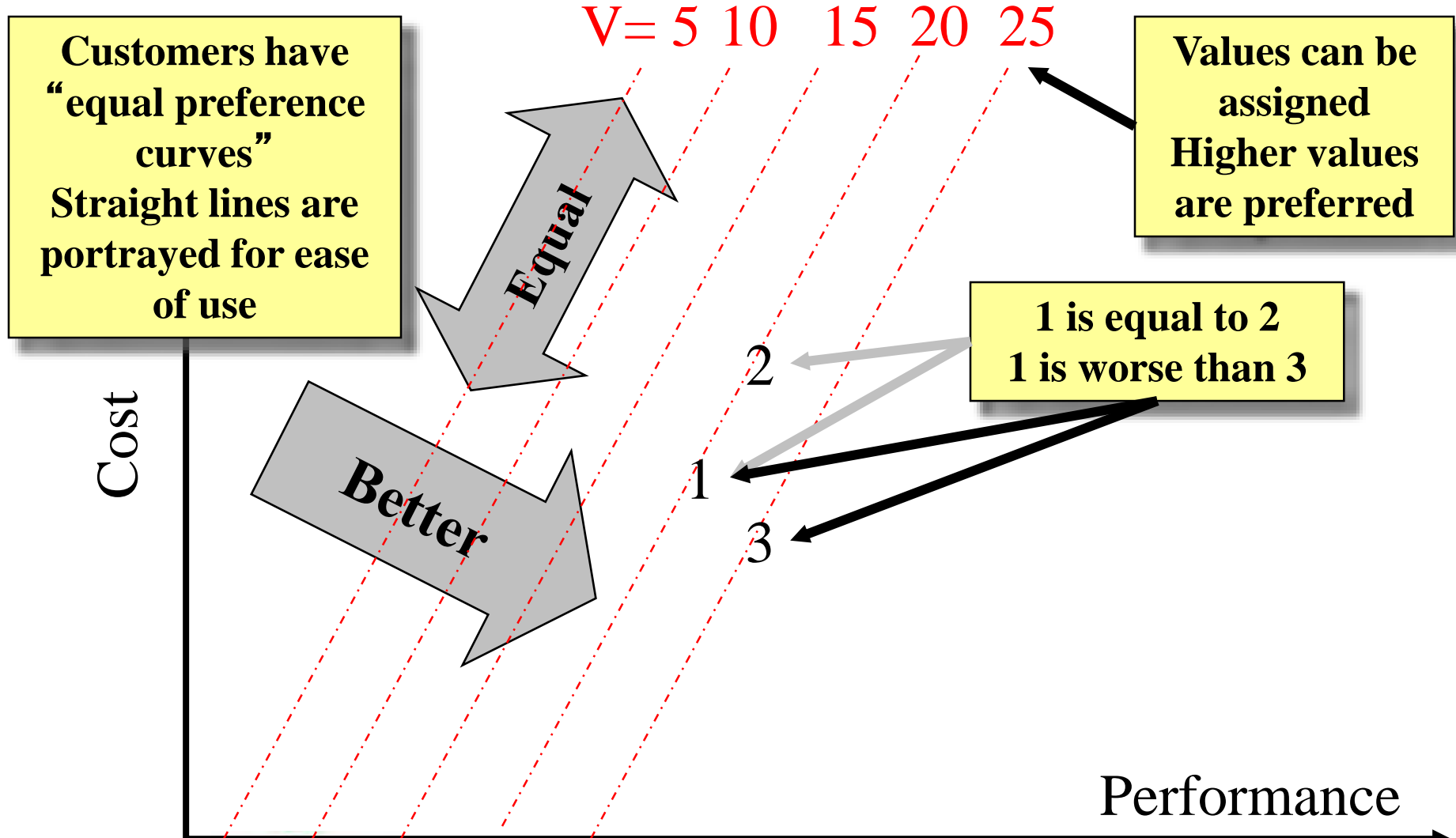
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Best “Bang for the Buck”

When unit cost is paramount



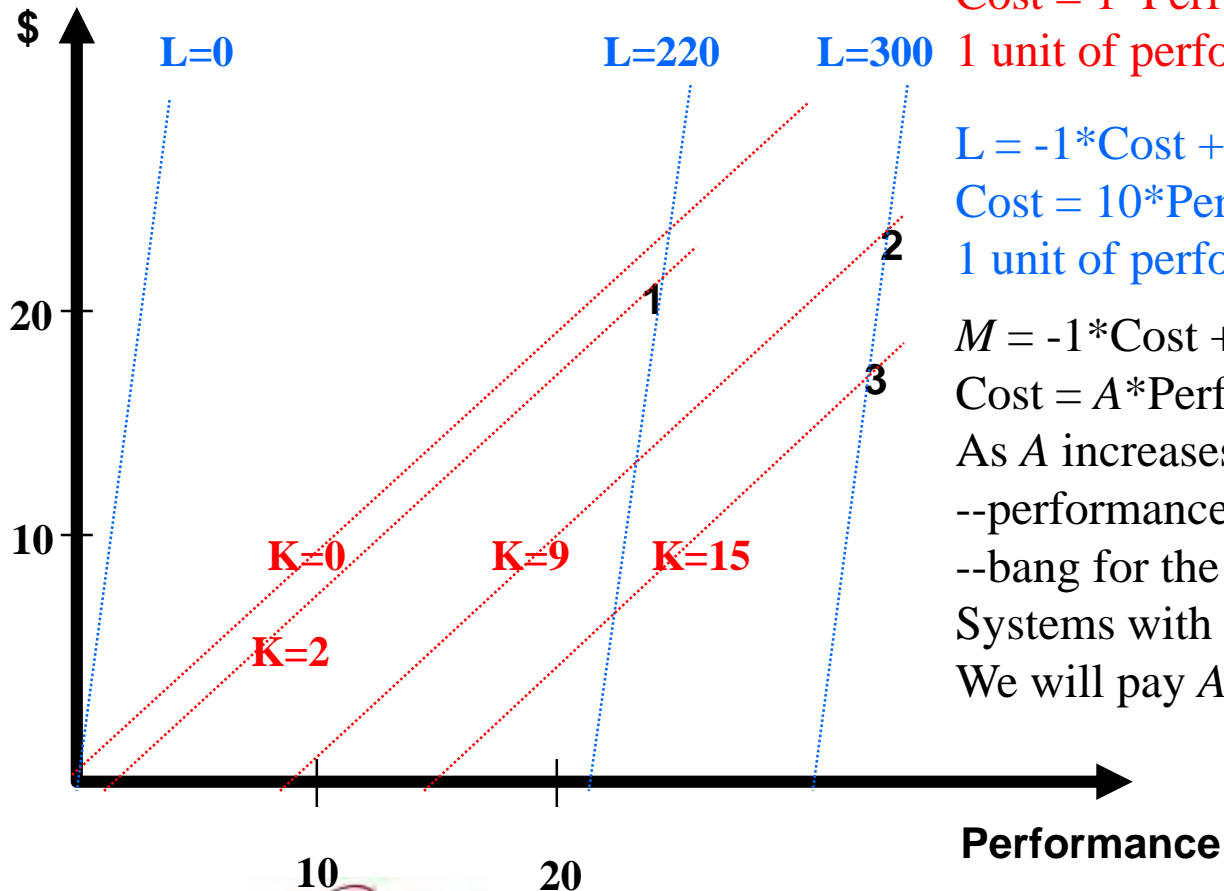
Exchange Rate



Exchange Rate

When you know the “Dollar Value” of Performance

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$$K = -1 * \text{Cost} + 1 * \text{Perf}$$

$$\text{Cost} = 1 * \text{Perf} - K$$

1 unit of performance = 1 unit of cost

$$L = -1 * \text{Cost} + 10 * \text{Perf}$$

$$\text{Cost} = 10 * \text{Perf} - L$$

1 unit of performance = 10 units of cost

$$M = -1 * \text{Cost} + A * \text{Perf}$$

$$\text{Cost} = A * \text{Perf} - M$$

As A increases,

--performance is more important,

--bang for the buck is sacrificed

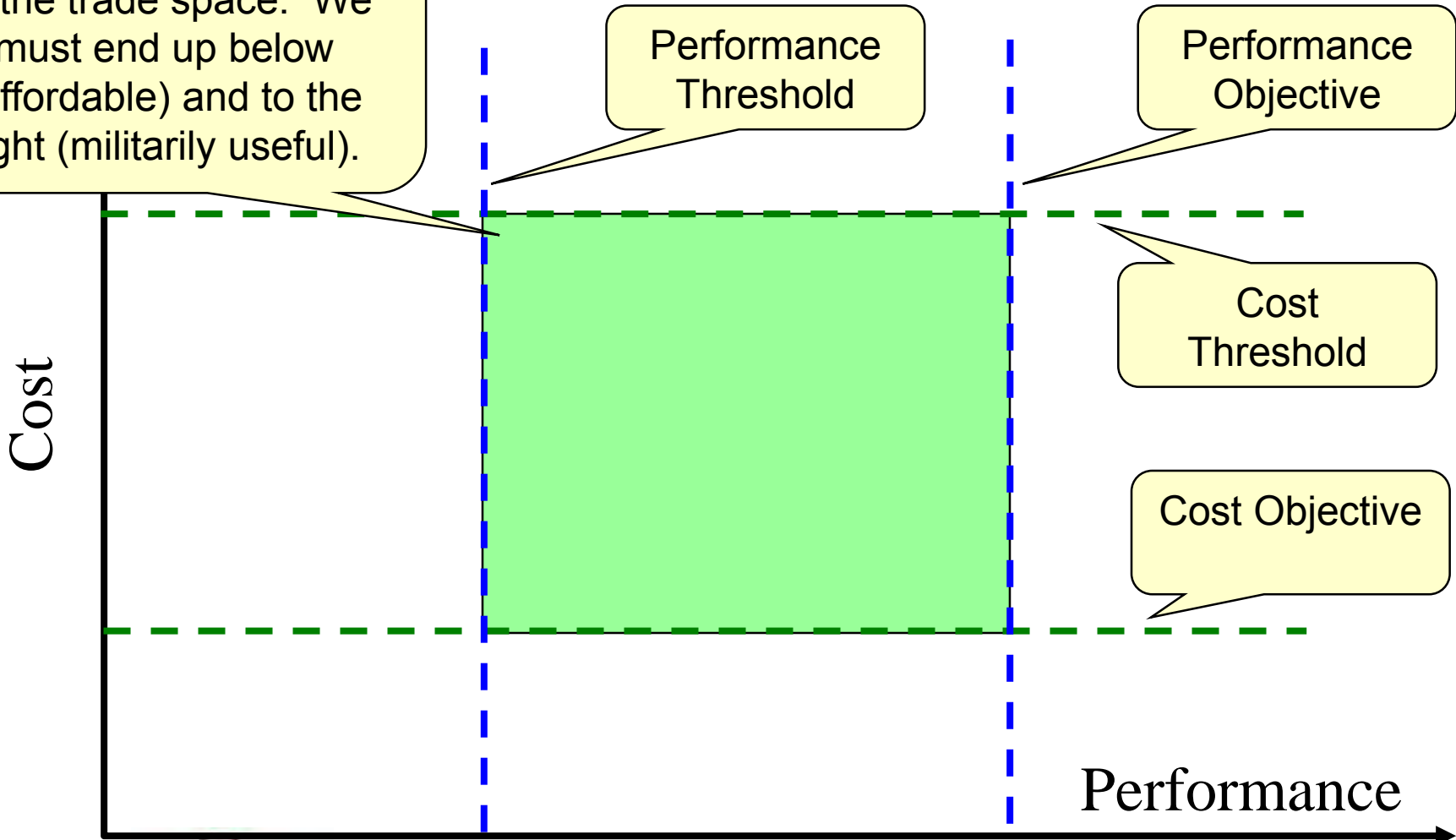
Systems with higher M values are preferred

We will pay A dollars per unit of performance

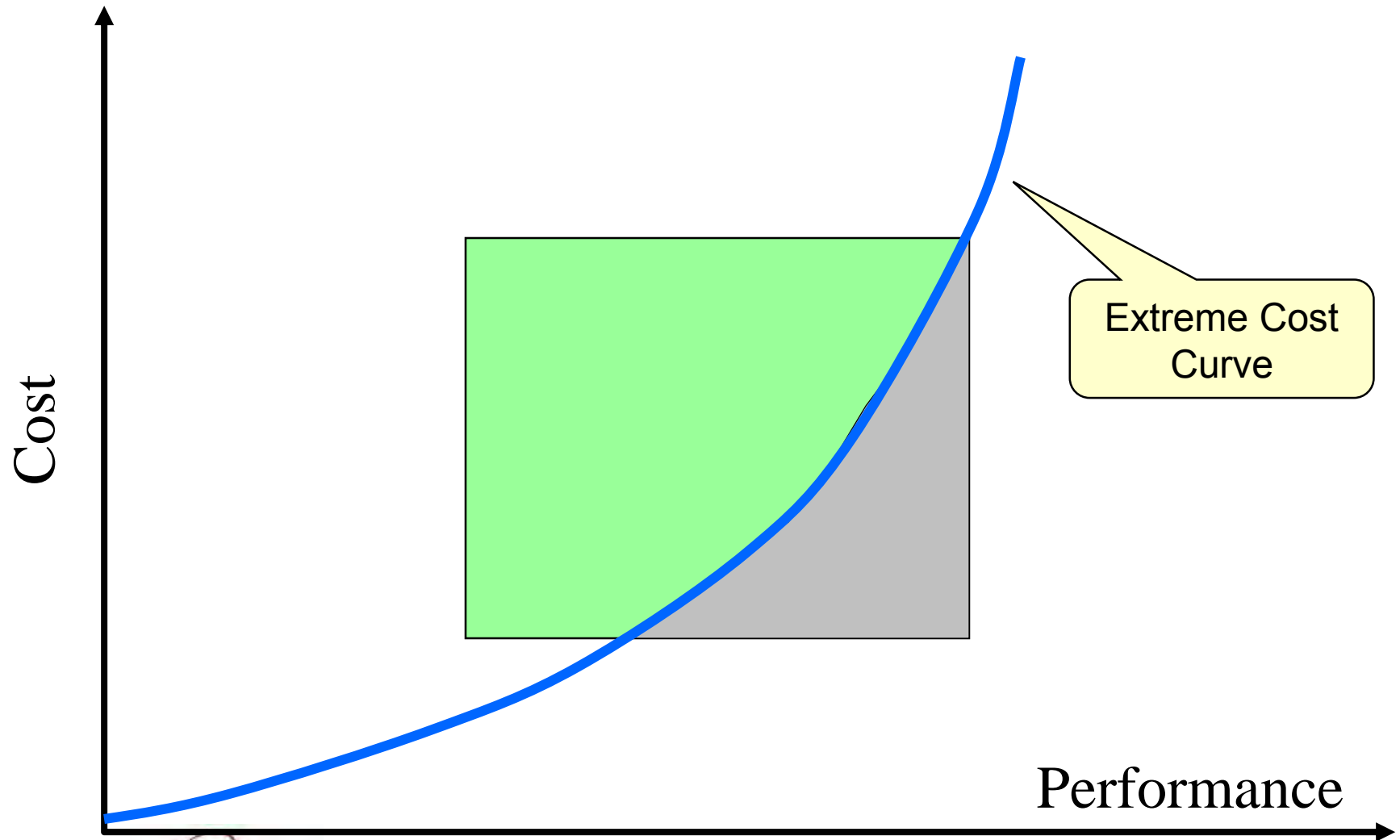
Trade Space Boundaries -

Thresholds and Objectives

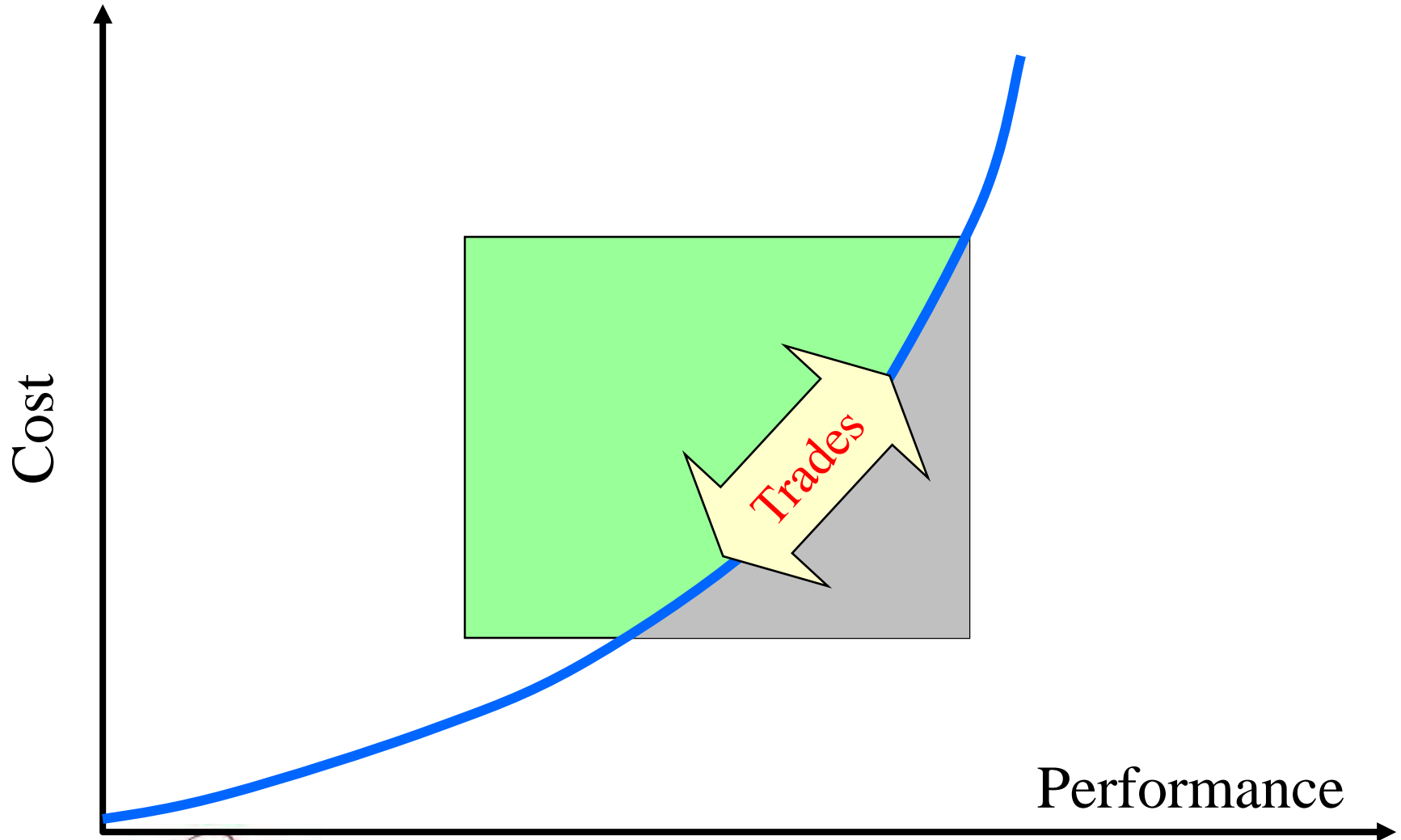
This is the crucial corner of the trade space. We must end up below (affordable) and to the right (militarily useful).



Trade Space Boundaries - Extreme Cost Curve



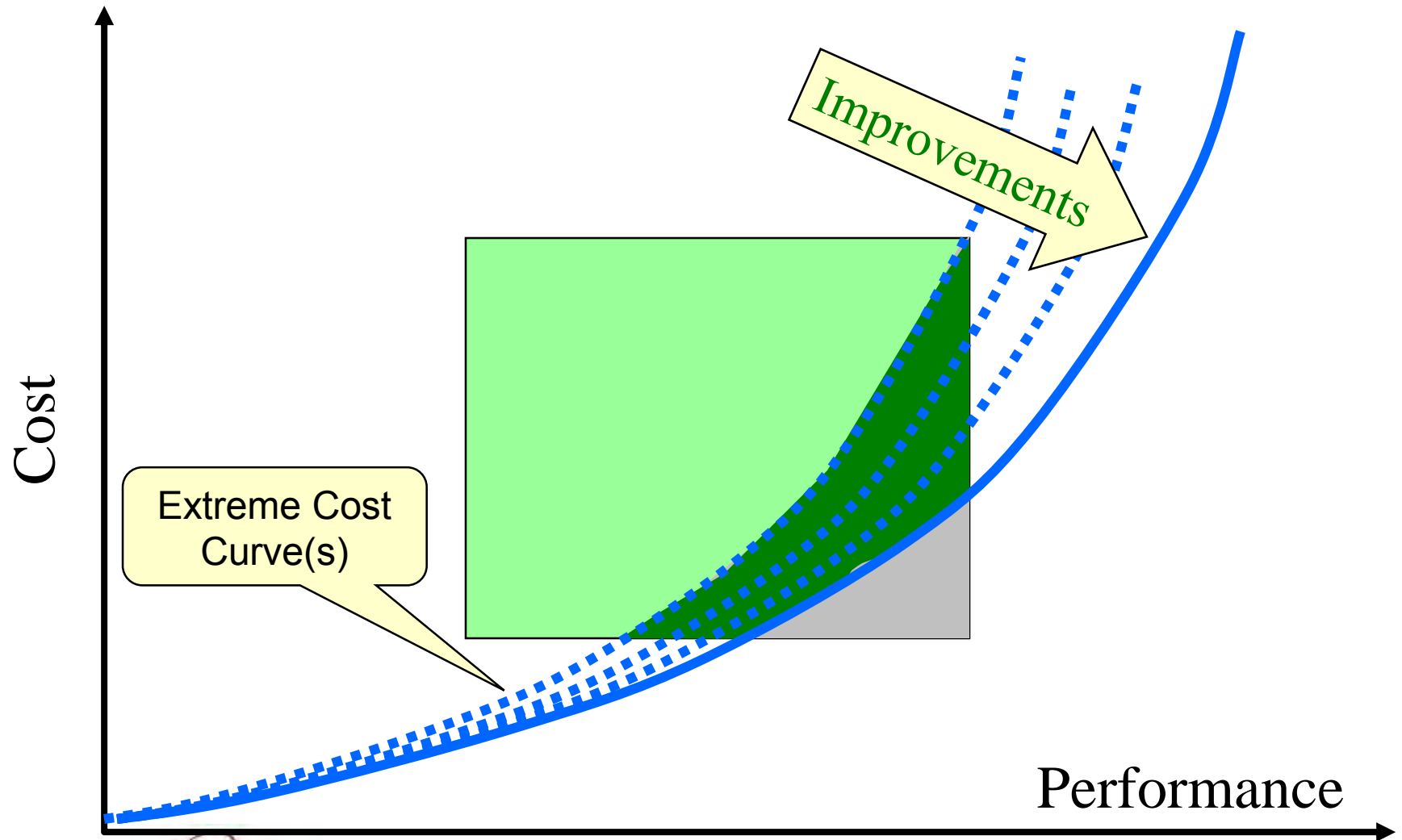
Trades



Unit V - Module 16

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Improvements

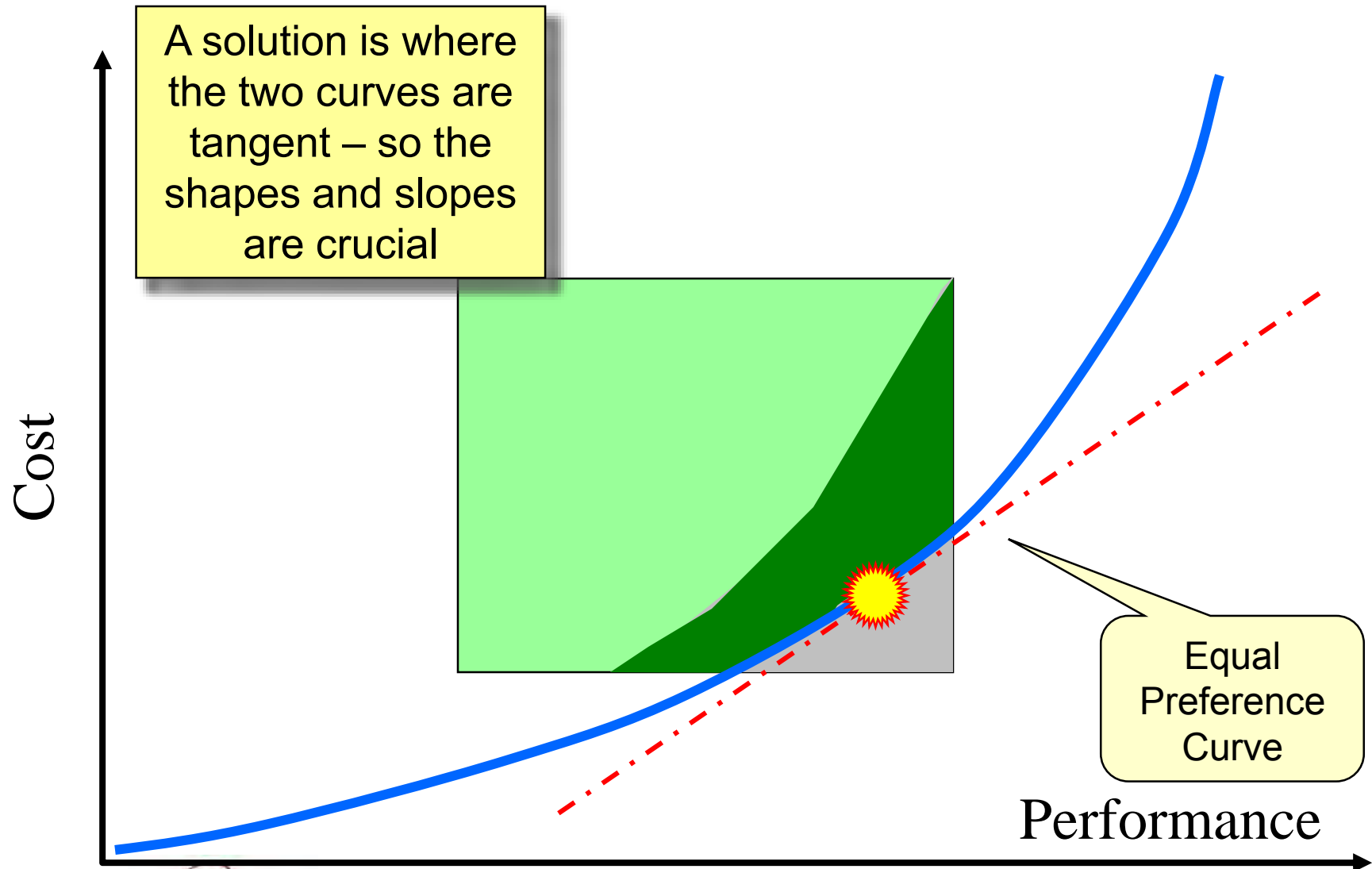


Extreme Cost Curve(s)

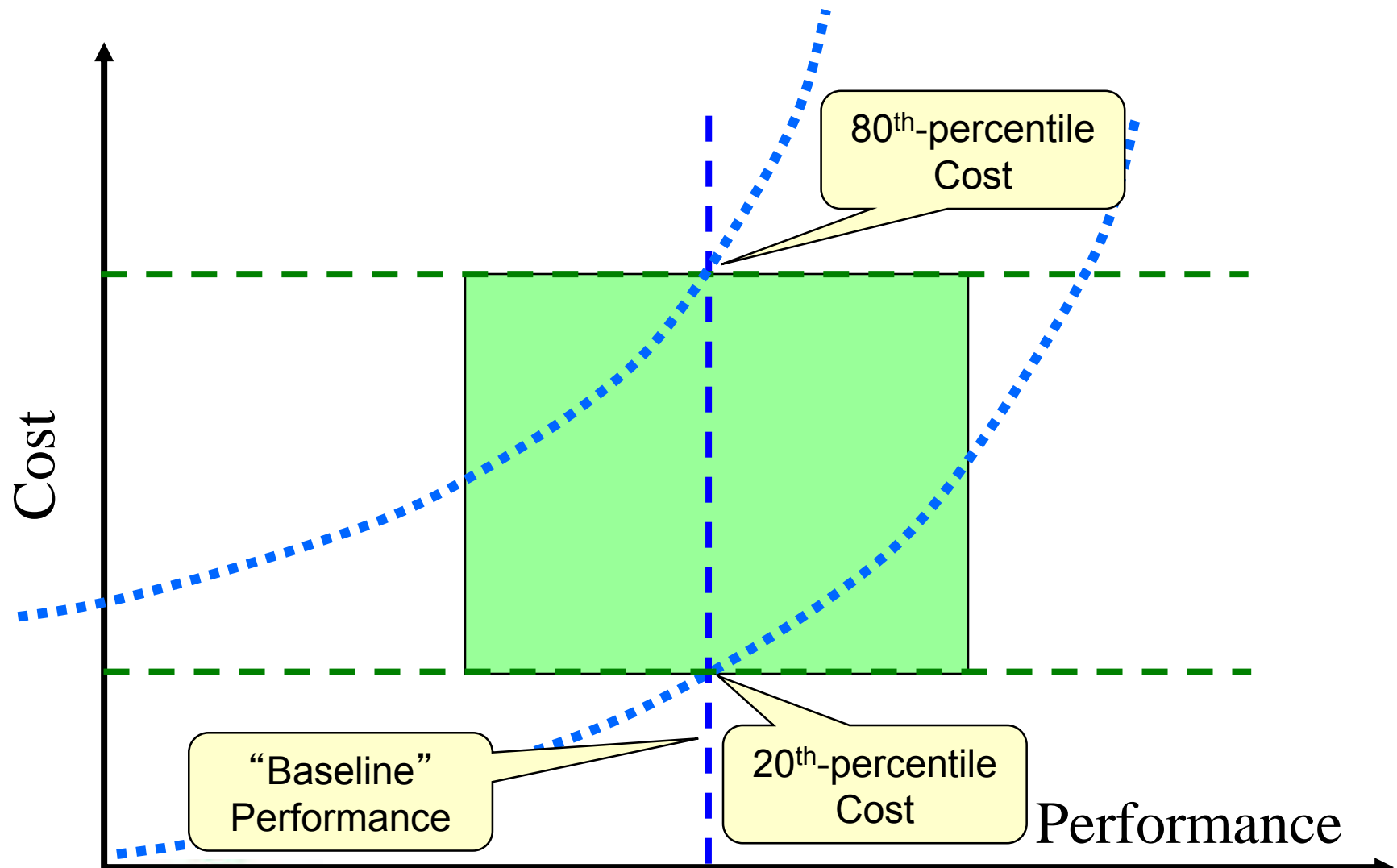
Improvements

Performance

Choosing an Optimum



Setting Thresholds and Objectives



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Thresholds and Objectives - Pitfalls to Avoid

- Not including Risk in targets
 - Estimates without Risk are not realistic
- Setting Threshold Cost based on Threshold Performance
 - No trade space left to strive toward Objective Performance
- Setting Objective Cost as an arbitrary percent reduction from Threshold Cost
- Setting targets inconsistently
 - Between Cost and Performance, or between various life-cycle phases for Cost
- All the above are variants of “Cost Fantasy,” where targets are “arbitrary, politically-driven values that are unachievable and guarantee failure”
 - Any well-meaning attempt at setting targets involving the right personnel from Requirements and Acquisition is bound to do better
 - Engineers/architects and cost estimators are particularly important



Warning: Beware
“Cost Fantasy”

You ain' t doin' CAIV if you ain' t...

- ...doing **cost estimating**
 - **Single most important tool of CAIV**
 - Need an estimate that reflects the effects that you're discussing and considering
 - If you don' t have a good cost estimate, you can' t do CAIV
 - If you don' t have a *brilliant* cost estimate, you can' t do CAIV very well

A Good Cost Estimate

Why You Need One

- Linkage
 - Can't trade cost and performance unless you establish a link between the two
- Credibility
 - Your analysis does no good if people aren't going to believe you
 - Becomes more important as the need to establish linkage forces a departure from conventional methodology
- Need to “achieve success with the external world”

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A Good Cost Estimate

Barriers You Face

- Most CERs are weight-based
 - Need to develop CERs responsive to technical parameters under consideration
- Need to “adjust” history
 - Trying to make improvements leads to innovation
 - Historical data may not be typical
 - Need to ground estimate in historical data forces creative ways to adjust history for new ways of doing business
 - Be careful that you are *adjusting* history not *ignoring* it
- Cost estimators are seen as barriers to CAIV
 - Don't blame the score on the scorekeeper!
 - Once they get cut out, it's make up numbers and off they go!



Performance Estimating Relationships (PERs)

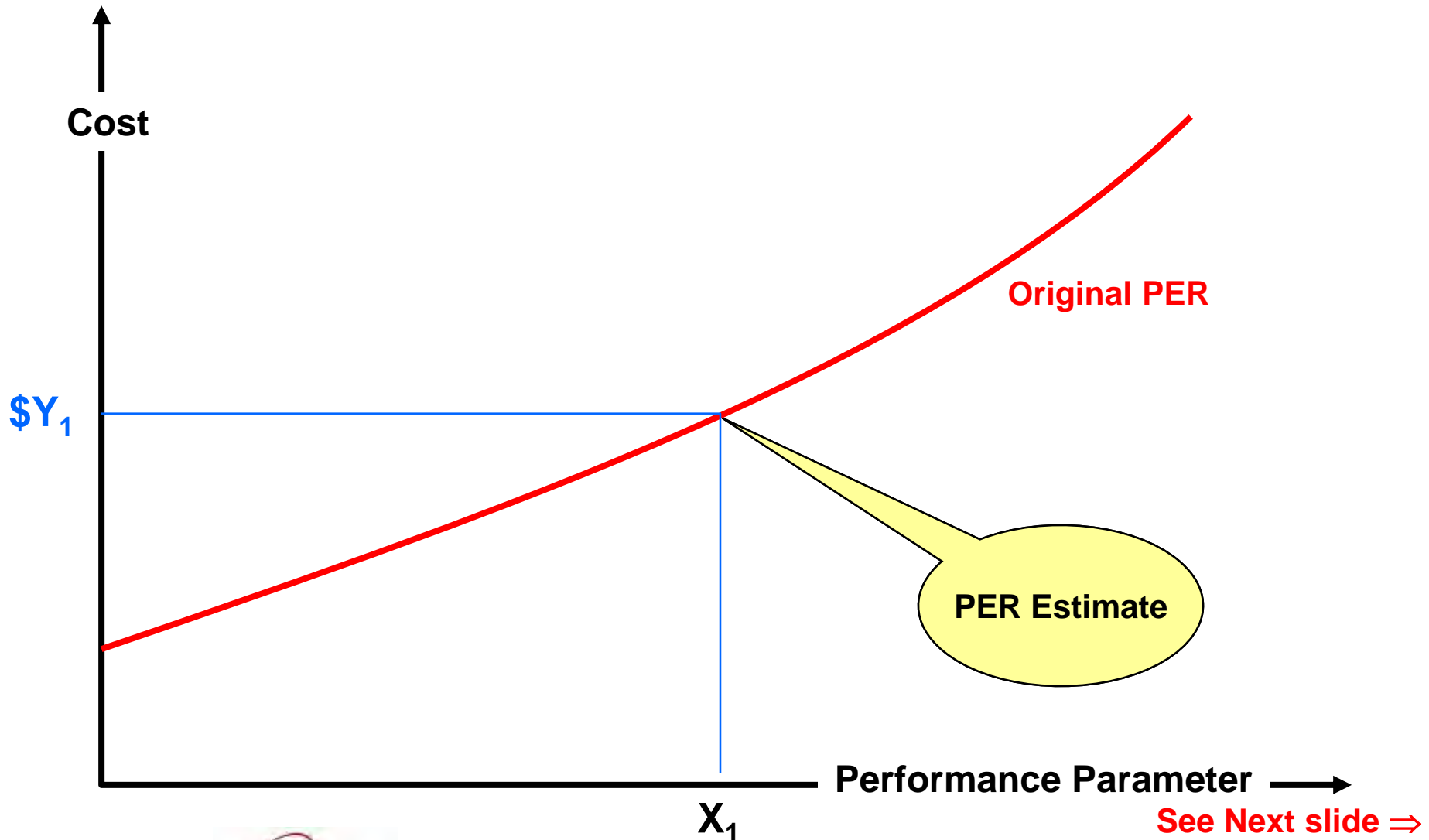
- Cost estimators and designers must make a conscious effort to shift their focus to more useful parameters
- Most cost estimates contain Cost Estimating Relationships (CERs) based on weight and other parameters formerly pre-eminent in Design
 - These were desired in the past, since weight is often the best known parameter in a design, especially in any granularity
- Some CERs with useful parameters were considered, but rejected since they gave less accurate predictions
 - These equations must be re-discovered and brought into use
- PERs are needed to conduct meaningful trades
 - But performance parameters are not often found in cost estimates
- If PERs are not good enough predictors, they can be “calibrated”
 - Re-set the y intercept to pass through a point predicted by a better CER
 - Use the PER to predict best departure slopes from a best starting point
 - Re-calibrate periodically as deemed necessary



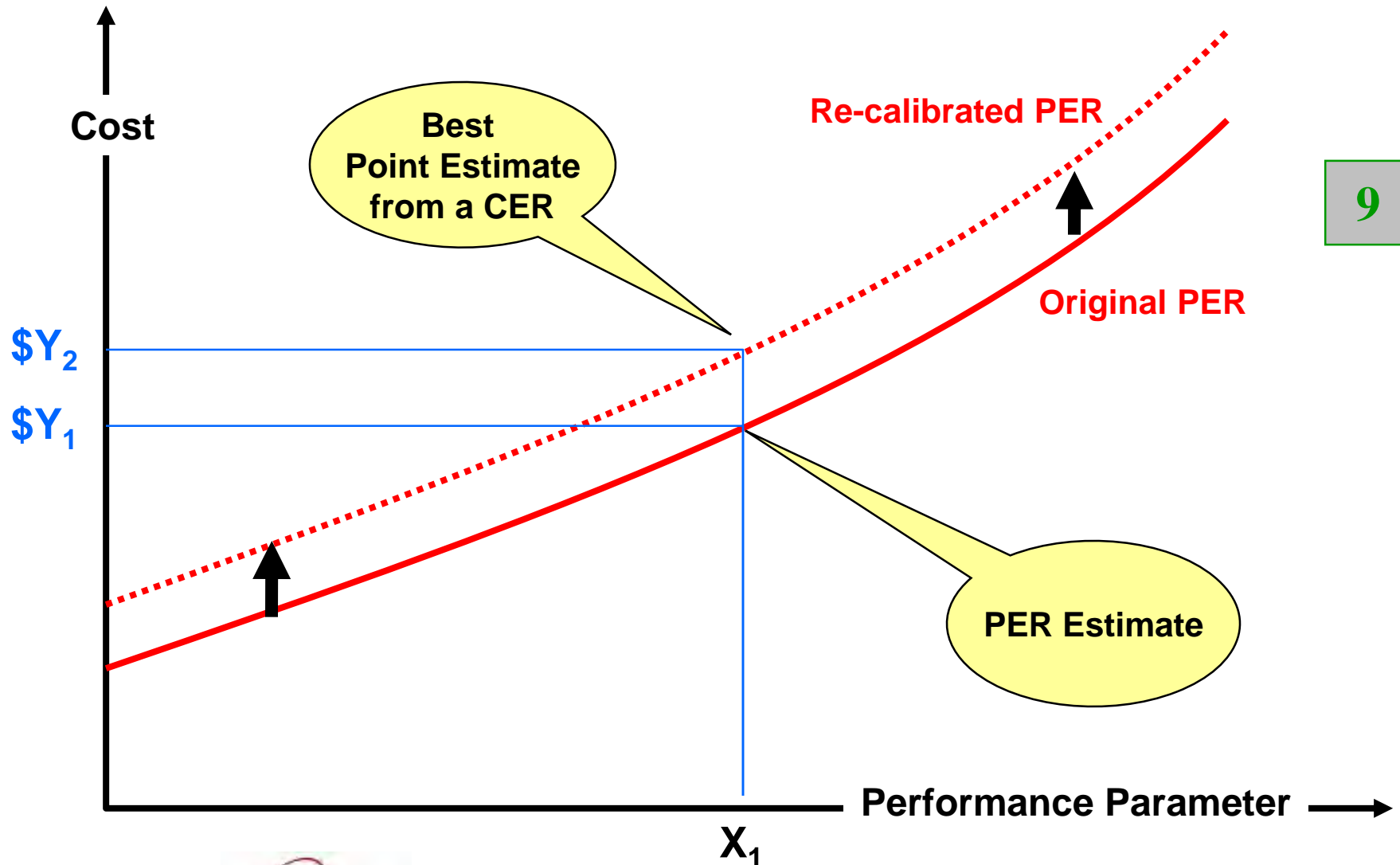
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“A Framework for Costing in a CAIV Environment,” Richard L. Coleman, Dineen O. Mannarelli, DoDCAS, 1996.

Calibrating PERs



Calibrating PERs



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Should Cost



- Should Cost is a method for setting targets in CAIV and Target Costing
- Specialized form of cost analysis
 - Does not assume that historical costs reflect efficient and economical operation
 - Evaluates the economy and efficiency of the existing work force, methods, materials, facilities, operating systems, and management
 - Accomplished by a multi-functional team of contracting, contract administration, pricing, audit, and engineering representatives
 - Objective is to promote both short and long-range improvements in economy and efficiency in order to reduce the cost of performance of contracts
 - More realistic objectives for negotiation can be developed

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Should Cost

- Two types of should cost analysis
 - Program should cost analysis - used to evaluate significant elements of direct costs, such as material and labor, and associated indirect costs, usually associated with the production of major systems
 - Overhead should cost analysis - used to evaluate indirect costs, such as fringe benefits, shipping and receiving, facilities and equipment, depreciation, plant maintenance and security, taxes, and general and administrative activities
- Scope can range from a large-scale analysis examining the entire operation to a small-scale tailored review examining specific portions of a operation



Warning #1: Should Cost requires significant benchmarking and industry database, else it devolves into wishful thinking.

CAIV Pre-conceptions

- CAIV is nothing new
 - CAIV shifts the paradigm
 - Has a dramatic effect on the requirements process to consider costs early
 - Involves the user early and continuously to provide input to trade-offs
- CAIV is too radical
 - Embodies and attempts to institutionalize previously utilized Best Practices:
 - Only buying what you can afford
 - Capping costs
 - Reducing all costs, incurred or influenced
 - Trading off some capabilities to reduce cost, while maintaining “Key Performance Parameters”
 - Incentivizing cost reduction
- CAIV is just Design to Cost (DTC)
 - DTC, focused on unit cost, not Life Cycle Cost (LCC)
 - DTC is a tool in the CAIV toolset.
- CAIV is about increasing performance at a fixed cost
 - Some would argue CAIV primarily intended to improve performance for a given cost
 - Others would argue primarily intended to reduce costs for a given performance.
 - In reality, CAIV strives to reduce cost and improve performance in various combinations
 - CAIV cost reductions depend on program priorities and decision makers

CAIV Stakeholder Perceptions - Conclusions

https://www.iceaaonline.org/chapters/new_england/index.cfm

- Nearly all government and industry respondents believe that a well executed CAIV program is a highly effective key to program success
- Government managers expect CAIV to Be conducted As Standard work On most programs - as opposed to most industry managers
- The focus of industry managers on near term contract deliverables often leads to limited CAIV activity early in program, when it is most effective
- CAIV is not well supported by government or internal budgets
- Preponderance for initial CAIV application during SD&D is too late for significant impact on production and support costs -the longer view is often overlooked
- There remains overall stakeholder skepticism for the accuracy of CAIV estimates
 - ∞ Government has low confidence in CAIV estimating accuracy
 - ∞ Low investment in cost methodology and robust application may lead to increased estimate skepticism
 - ∞ Skepticism leads to limited budget
 - ∞ The basis for low confidence in estimating accuracy must be determined and addressed



Cost Management Summary

- Cost management addresses Total Ownership Cost (TOC) via supporting methodologies:
 - CAIV, Target Costing, ABC
 - Economic Analysis, Contracting, EVM
- The future of cost estimating and analysis?
 - Cost modeling
 - Wider, more rigorous application
 - Better integration with management

Resources - Government

- TOC
 - “Total Ownership Cost (TOC) Pilot Programs,” USD(A&T), 13 April 1998
 - “Definitions of Total Ownership Cost (TOC), Life Cycle Cost (LCC), and the Responsibilities of PMs,” USD(A&T), 13 November 1998
 - “Implementation of Total Ownership Cost (TOC) Baselines in the Department of the Navy,” ASN(RD&A), 5 May 1998
- CAIV
 - “Cost-as-an-Independent Variable (CAIV) and Spiral Development Implementation Plans,” USD(AT&L), 19 Jan 2002
 - “Cost As an Independent Variable,” USD, December 1995
 - “Cost As an Independent Variable (CAIV) Policy Guidance,” SECNAV, 16 April 1998
 - “Implementing Cost As an Independent Variable,” SAF/AQ, 12 March 1997
 - Army Regulation 70-1 “Army Acquisition Policy,” 15 January 1998
 - “Policy on Cost-Performance Trades,” USD, 19 July 1995
- Other
 - Circular A-131 “Value Engineering,” Office of Management and Budget (OMB), 1993, <http://www.whitehouse.gov/omb/circulars/a131/a131.html>

Resources - Industry

- *Value Quest: Driving profit and performance by integrating Strategic Management Processes*, C.J. McNair et al., CAM-I, 2000
- *Target Costing: The Next Frontier in Strategic Cost Management*, Shahid Ansari, Jan Bell, et al., CAM-I, 1995
- *Target Costing Best Practices Study*, CAM-I, February, 1999
- *Target Costing Implementation Best Practices Study*, CAM-I, March, 2002
- *An ABC Manager's Primer*, Gary Cokins, Alan Stratton, Jack Helbling, CAM-I, 1995
- *Hitting the Target*, Shahid Ansari, Jan Bell, Dan Swenson, CAM-I, 2006
- "The Probable Lowest-Cost Alternative According to Borda," Neal D. Hulkower, *Journal of Cost Analysis and Parametrics*, Volume 3, Issue 2, Fall 2010

Resources - Web

- Acquisition Community Connection (ACC), <https://acc.dau.mil>
- Consortium for Advanced Management - International (CAM-I), <http://www.cam-i.org>
- Society of American Value Engineers (SAVE), <http://www.value-eng.org>

Test Questions

Question 1: **True or False.** CAIV is the primary acquisition process and strategy for meeting requirements while reducing TOC.

- **True.** CAIV uses better business practices, allows for trade space so industry can meet user needs, and considers O&M costs early in the lifecycle of a program.

Test Questions

Question 2: **True or False.** CAIV is the best way to affect costs early in the development of a system or program.

•**True.** Costs savings are best achieved early in the lifecycle of a program where design decisions can be made that will reduce TOC. CAIV allows for cost to be an input into the design process early in the program, thereby helping to reduce the total ownership cost of the system.

Test Questions

Question 3: True or False. Cost management is designed to bring about reductions in system and equipment costs

- **True.** Cost management is designed to bring about reductions in system and equipment costs primarily through increased consideration and analysis of the ownership (operation, maintenance, and support) cost implications of design alternatives.

Test Questions

Question 4: Which of the following is the most accurate statement of the importance of a good cost estimate with regards to CAIV?

- A. Solves the Exchange Rate problem by capturing customer preferences
 - B. Solves the Linkage problem by using weight-based CERs
 - C. Does not need to adjust historical relationships, because they are typical of the CAIV environment
 - D. Ensures credibility with both internal and external decision makers
- **Choice D** - A good cost estimate will be endorsed by both internal and external decision makers. You need to have buy in from both sides to be successful.

Test Questions

Question 5: True or False. The impetus for cost management is that organizations are challenged with the need to reduce value of their products and services while decreasing cost structures.

- **False.** It does not make sense to try to reduce the value of your products.

Quick Management Test

Are you qualified to be a "manager"?

1. How do you put a giraffe into a refrigerator?

- Correct Answer: Open the refrigerator, put in the giraffe, and close the door.
- This question tests whether you tend to do simple things in an overly complicated way.

Quick Management Test

2. How do you put an elephant into a refrigerator?
- Wrong Answer: Open the refrigerator, put in the elephant, and close the refrigerator.
 - Correct Answer: Open the refrigerator, take out the giraffe, put in the elephant and close the door.
 - This tests your ability to think through the repercussions of your actions.

Quick Management Test

3. The Lion King is hosting an animal conference; all the animals attend except one. Which animal does not attend?

- Correct Answer: The Elephant. The Elephant is in the refrigerator.
- This tests your memory.

Quick Management Test

One more chance to show your abilities.

4. There is a river you must cross. But it is inhabited by crocodiles. How do you manage it?

- Correct Answer: You swim across. All the Crocodiles are attending the Animal Meeting!
- This tests whether you learn quickly from your mistakes.
- According to Andersen Consulting World wide, around 90% of the professionals they tested got all questions wrong. But many pre-schoolers got several correct answers.
- Andersen Consulting says this conclusively disproves the theory that most management consultants have the brains of a four year old.

Related and Advanced Topics

- WSARA vs. BBP
- Fully Burdened Costs of Energy and Manpower
- Coda: Initiatives and Cost Estimating

WSARA

- Weapon Systems Acquisition Reform Act (WSARA) of 2009 (Public Law 111-23)
 - Unprecedented unanimous passage in Congress
- Major changes:
 - Organizational/Personnel
 - Established current Cost Assessment and Program Evaluation (CAPE) and Performance Assessments and Root Cause Analyses (PARCA) organizations
 - Acquisition Policy and Process
 - Increased emphasis on Milestone A
 - Congressional Reporting Requirements

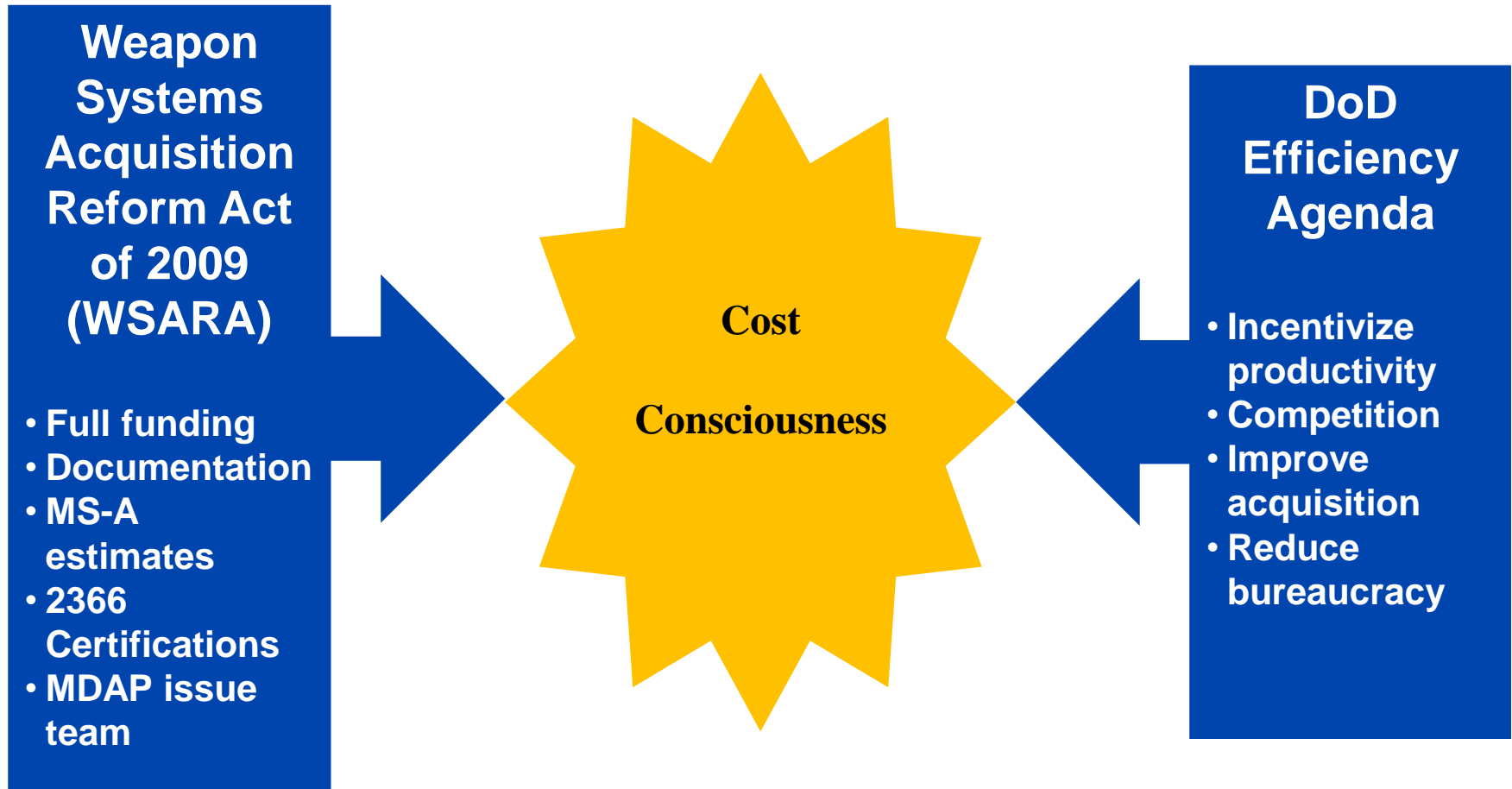
“Cost Implications of WSARA in the Context of Managing the Defense Enterprise” (INT 12), Brian Flynn, SCEA/ISPA 2012.

DoD Efficiency Agenda

- Better Buying Power (BBP) = “Greater Efficiency and Productivity in Defense Spending”
 - Spearheaded by then-USD(AT&L) Dr. Ashton Carter, Frank Kendall
- Will Cost (ICE) vs. Should Cost (achievable efficiencies)
- BBP 2.0 Initiatives:
 - Achieve Affordable Programs
 - Control Costs Throughout the Product Lifecycle
 - Incentivize Productivity & Innovation in Industry and Government
 - Eliminate Unproductive Processes and Bureaucracy
 - Promote Effective Competition
 - Improve Tradecraft in Acquisition of Services
 - Improve the Professionalism of the Total Acquisition Workforce

USD(AT&L) memos “Better Buying Power” (28 Jun 2010, 14 Sep 2010), “Implementation Directive for Better Buying Power” (03 Nov 2010), “Savings Related to ‘Should Cost’ ” (22 Apr 2011), “Should-cost and Affordability” (24 Aug 2011), “Better Buying Power 2.0” (13 Nov 2012).

Conflict or Compatibility?



“Air Force Cost Analysis in 2011,” Mr. Rich Hartley, Deputy Assistant Secretary of the Air Force (Cost and Economics), Aviation CIPT, Dayton, OH, 14 Sep 2011.

Fully-Burdened Cost of Fuel (FBCF)

- Establish Foundational & Surge scenarios
- Follow DAG guidance
<https://acc.dau.mil/dag3.1.6/>
- Define OPTEMPO ratio
- Compute Assured Delivery Price (ADP) = Prices (\$/gal)
- Define Platform's fuel demand (gal/flight hour)
- Compute Platform's FBCF (\$/flight hour)

Price: Value of a specified amount of a commodity (\$/gal)

Cost: Total amount spent to purchase a commodity (\$/FH)

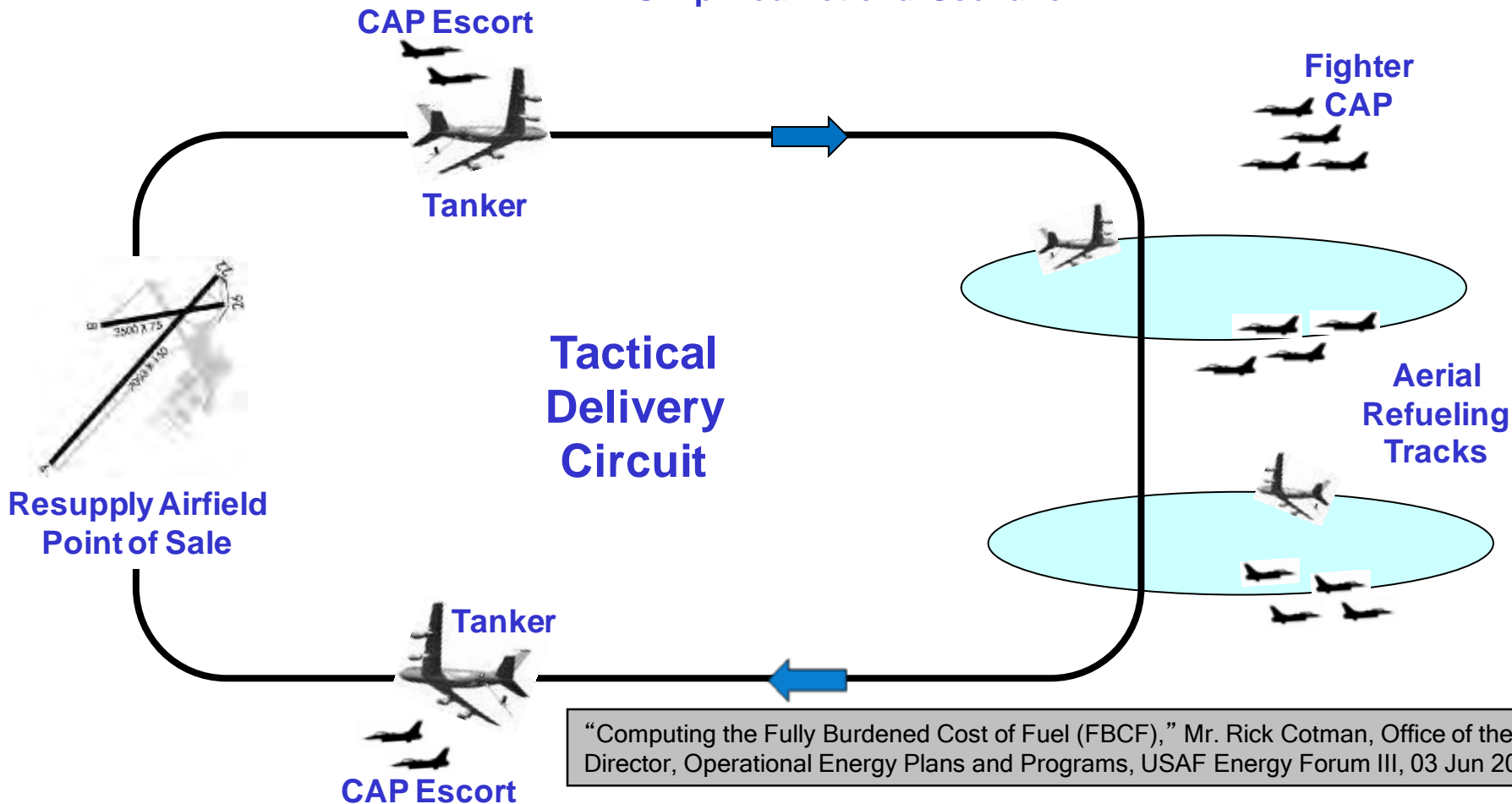
$$\text{ADP} * \text{Demand} = \text{FBCF}$$



“Computing the Fully Burdened Cost of Fuel (FBCF),” Mr. Rick Cotman, Office of the Director, Operational Energy Plans and Programs, USAF Energy Forum III, 03 Jun 2010.

FBCF Delivery Circuit - Air

Simplified Notional Scenario

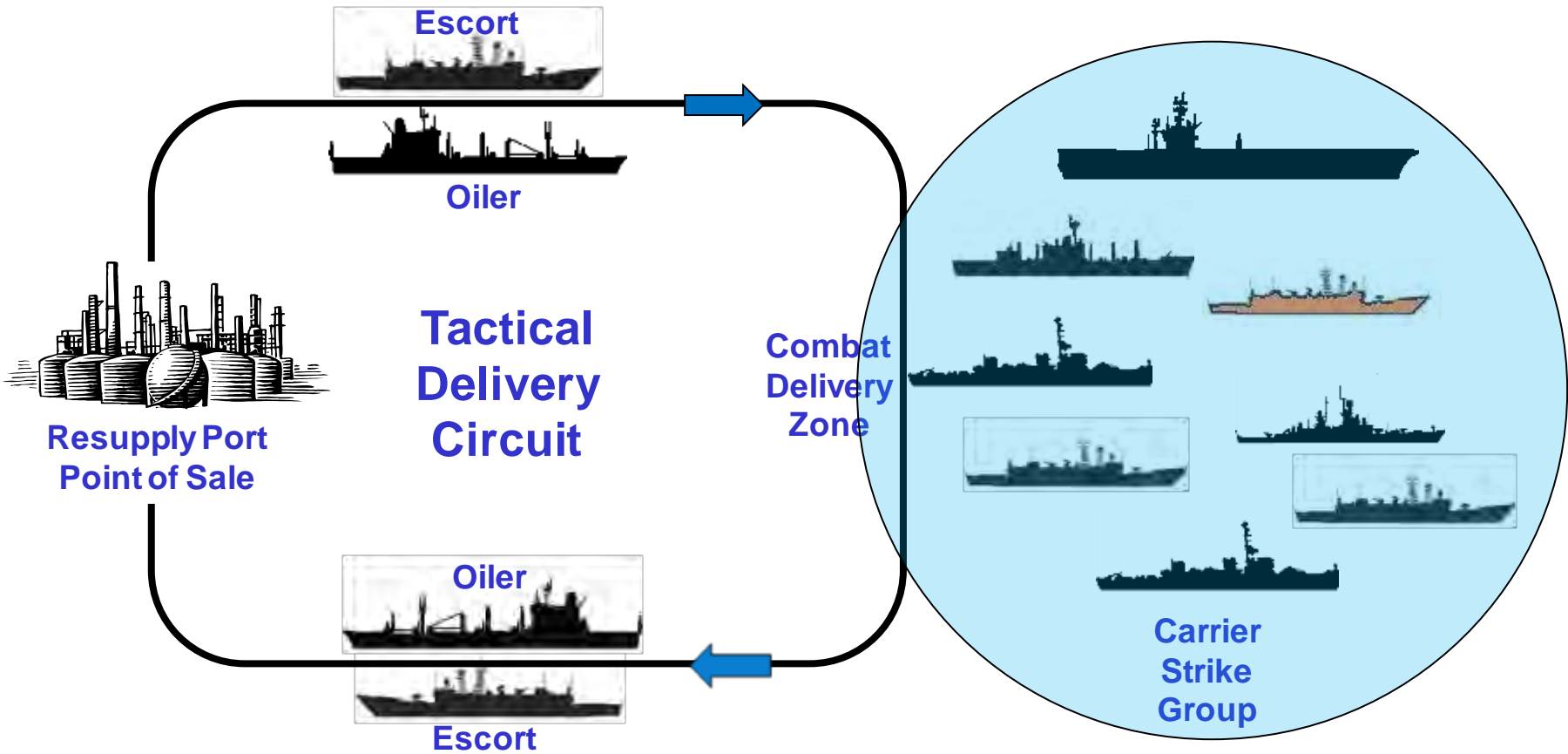


Not to Scale

Closed loop departing from and returning to DESC port/terminal

FBCF Delivery Circuit - Sea

Simplified Notional Scenario



“Computing the Fully Burdened Cost of Fuel (FBCF),” Mr. Rick Cotman, Office of the Director, Operational Energy Plans and Programs, USAF Energy Forum III, 03 Jun 2010.

Not to Scale

Closed loop departing from and returning to DESC port/terminal

Indirect Manpower

- Indirect Manpower is the full burdening of end-strength manpower costs
 - Similar to FBCF (or commercial overhead)
 - Account for infrastructure that recruits, trains, sustains, and relocates the “tip of the spear”
- Cost of a Sailor methodology evolved into METEOR
 - Tool that provides life-cycle cost (LCC) analysis of active duty personnel attached to ship platforms.

Manpower Cost Estimating Tool for Enhanced Online Reporting (METEOR), Naval Center for Cost Analysis (NCCA), <https://www.ncca.navy.mil/tools/tools.cfm>.

Initiatives, Thinking Outside the Box, and New Ways of Doing Business—*An Editorial*

- These observations result from a career of seeing initiatives not pan out
 - Thus becoming the source of cost growth when expected (and “baked-in”) savings fail to materialize
- Cost savings initiatives have little chance of success if they are:
 - Misapplied due to physical or usage barriers
 - Planning for robotics in weapons without sufficient units for amortization (or if planned quantities are suspect)
 - Use of COTS in field equipment where dust, moisture, salt water, etc., make redesign negate saving
 - Use of COTS Software when the user cannot be expected to “settle for as-is” or interfaces are ill understood
 - Misapplied due to unlike commodities
 - Open systems architecture (OSA) from electronics and IT systems to weapons when note is not taken of applicability
 - The lack of a robust source of alternatives and/or evolution, upon which OSA depends,
 - The fact that OSA applies not to structures, casings, or principal physical parts but rather to the electronic elements within

Cost Savings Initiatives Misapplied

- Cost savings initiatives have little chance of success if they are (cont' d.):
 - Misapplied due to fundamentally different business areas
 - Target costing from car manufacture (implemented as CAIV) when:
 - The many DoD decision makers are not all invested in the process
 - The appetite for cost is not sufficiently discernable
 - The cycle time is too long for decisions to “stick”
 - There is an adversary with the ability to “change the game”
 - Cost estimation is insufficiently respected to prevent changing the estimate instead of the product
 - Agile manufacturing from cars (or commercial ships and aircraft), where evolutionary changes are the norm, applied to military ships and aircraft, where revolutionary changes are the norm
 - Misapplied due to differences in process or work type
 - Lean and six sigma (LSS) from the production floor to staffs, headquarters, or overhead organizations
 - Activity-based costing (ABC) from organizations with specific products to organizations with broad responsibilities
 - Simply “New Year’ s Resolutions”
 - We’ ll (they’ ll) do better in the same work on a Fixed Price contract than before in Cost Plus
 - We won’ t make *those* mistakes again

Initiatives and Cost Estimating

- Cost estimators will frequently be called upon to include savings from initiatives or “new ways of doing business” (NWODB)
- Account must be taken of misapplications previously enumerated
- Allowances for initiatives that appear applicable should only be included when there is sound basis, just as for any other factor:
 - There must be at least one completed project to use as an analogy, and then only when the alleged savings are well demonstrated
 - This is inherently dangerous because of inherent randomness as well as problems like the “Hawthorne Effect”
 - It is preferable for there to be enough examples for normal statistical analysis to indicate the mean and the standard deviation at least, and if possible a CER
 - Possible (grudging) exceptions may be made for savings such as changed layout or manufacturing methods, when there is sufficient information to allow an industrial-engineering-type analysis such as a comparison of standards for the old and new work or layout, which could provide a ratio to apply to actuals
 - Note that standards are dangerous when they are taken as a sole first-time basis because realization factors may be large
 - This objection is ameliorated when they provide a basis for a factor as outlined above

