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Best Paper on
CAIV, LCC, & TOC
1999 Joint Conference, San Antonio, TX

Target Costing Best Practices

TOC/CAIV Workshop 99-3

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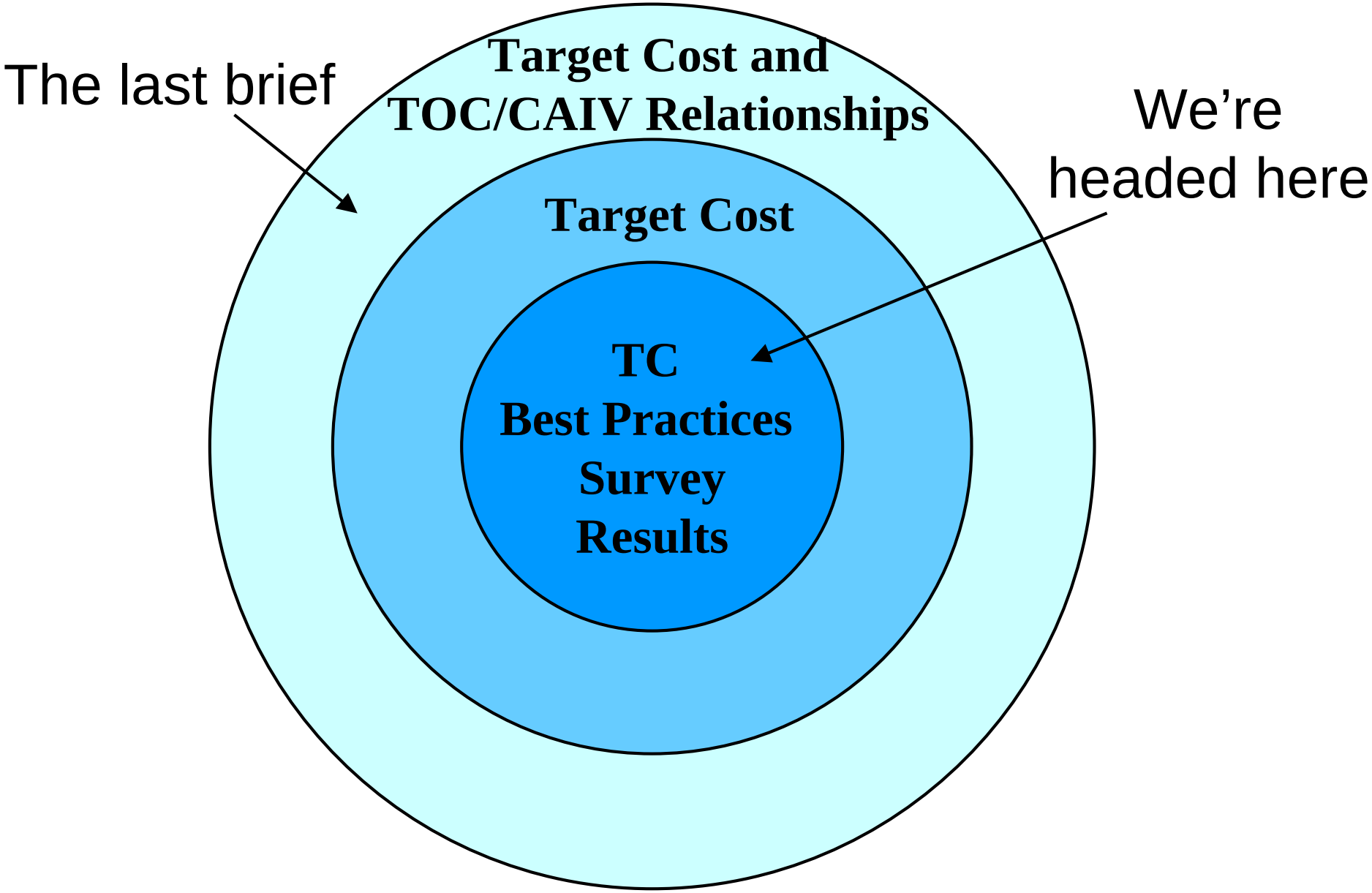
Outline

- **The History of Target Cost**
  - **evolution and revolution**
- **The Theory of Target Cost**
  - **putting cost first (and so much more)**
- **The Target Cost Methodology**
- **Results of Target Cost**
- **Target Cost (and thus CAIV) in Practice: CAM-I Target Cost Best Practices survey**

Target Costing Best Practices Survey

Peeling the *Target Cost and CAIV* Onion



A *Brief* History of Target Cost

The Evolution of Target Cost

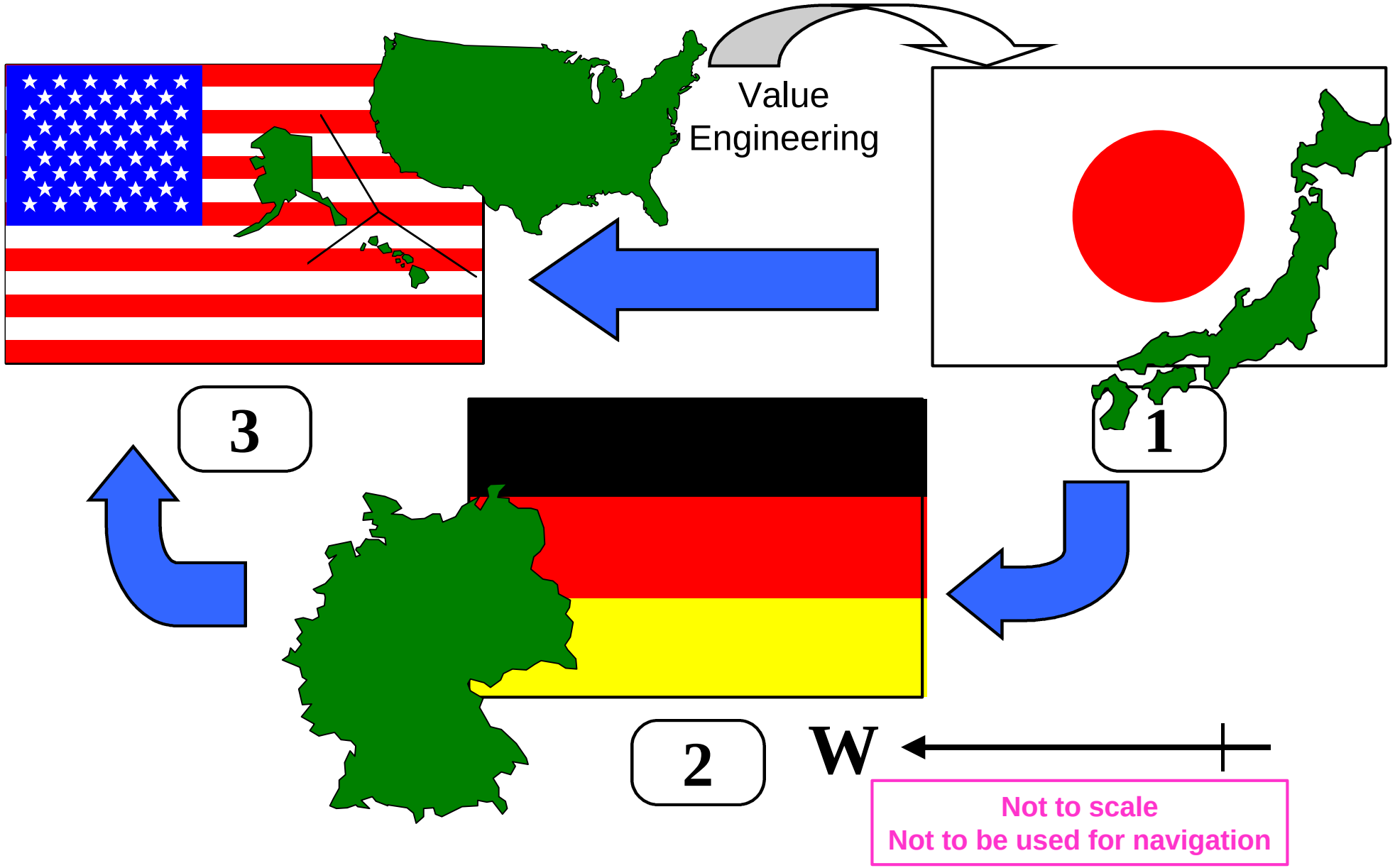
- **Target costing began in Japan in the 1960s**
- **"Japanese industry took a simple American idea called *value engineering* and transformed it into a dynamic cost reduction and profit planning system."**

Target Costing
(Ansari, Bell)

- **Japanese target costing developed, matured, and spread over a twenty-year period**
- **"Cost management is going to be for the automobile industry in the 1990s what quality control was in the 1970s and '80s."**

***Toyota Annual Report*, 1993**
(S. Toyoda, T. Toyoda)

The Evolution of Target Cost - Westward Flow



The Revolution of Target Cost

- **Response to the revolution in business environment, which has become more *competitive*, *rapidly changing*, *unforgiving of mistakes or delays*, and *demanding***
- **Paradigm shift from *cost plus* to *price minus***
- **Enterprise-wide system of strategic cost management and profit planning**
- **Startling idea that it is possible to *simultaneously*:**
  - **improve quality**
  - **reduce cycle time**
  - **reduce cost**

"BETTER, FASTER, CHEAPER"

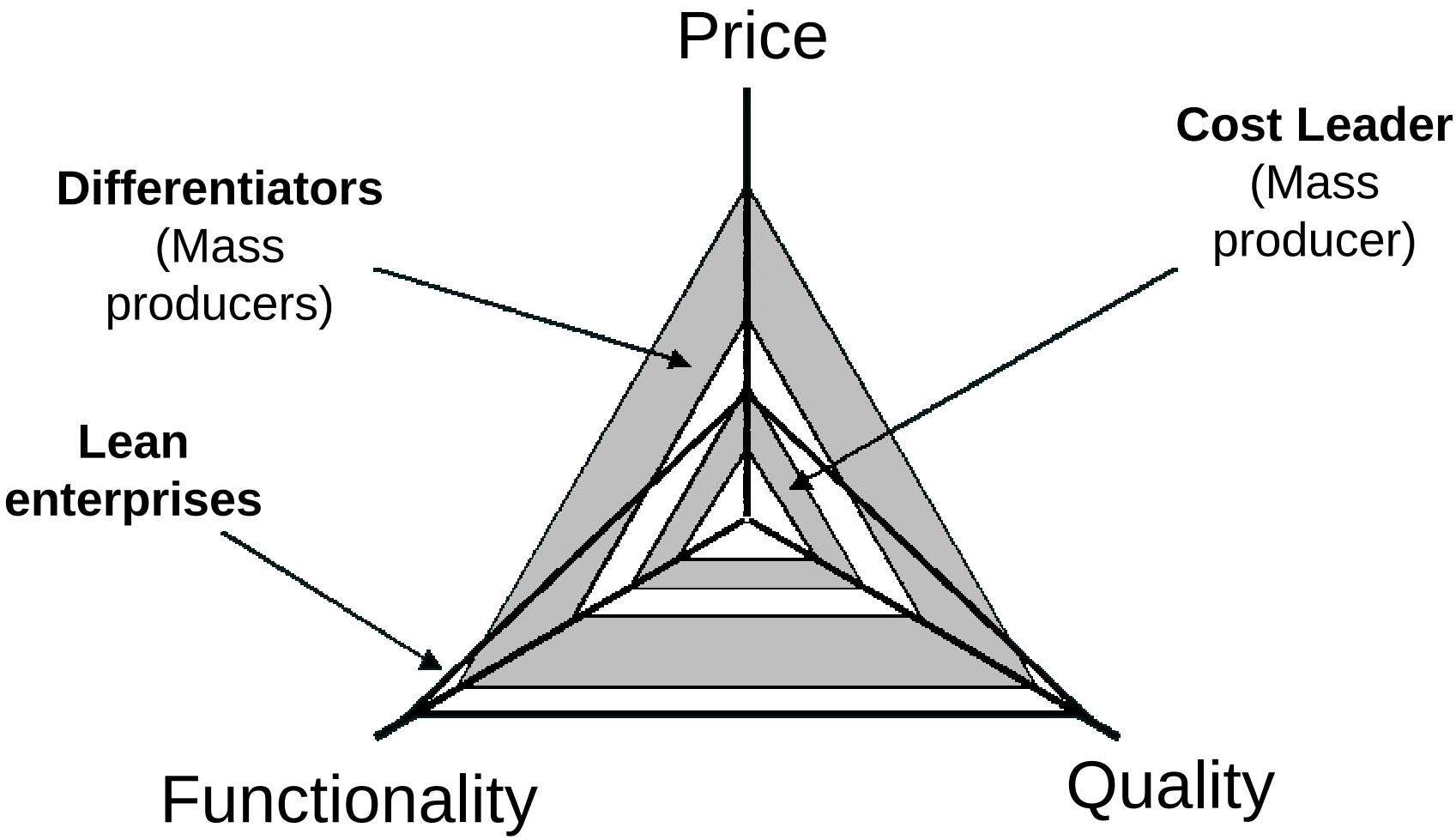
Confrontational Cost Management

- **Confrontational Cost Management is a strategy employed by Lean Producers**

Target Costing (Cooper, Slagmulder)

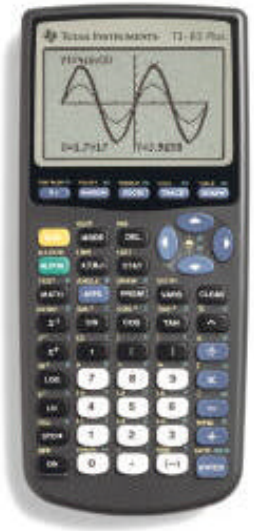
Lean Enterprises vs. Mass Producers

- **"The emergence of the lean enterprise changes the shape of the survival zone."**



The Theory of Target Cost

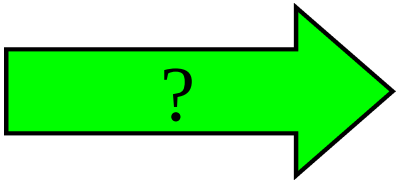
Target Costs - Examples [1]



- **Texas Instruments:**
  - **"Deliver a hand-held calculator for $100."**
- **DEC station 3100:**
  - **"Break the $1000/MIPS Barrier."**
- **Kodak FunSaver Camera:**
  - **"Sold between $13-$18."**

Target Costs - Examples [2]

- **Ford 1989 Thunderbird:**
  - **"Trying to make a BMW (5 series) that could sell for $15,000."**



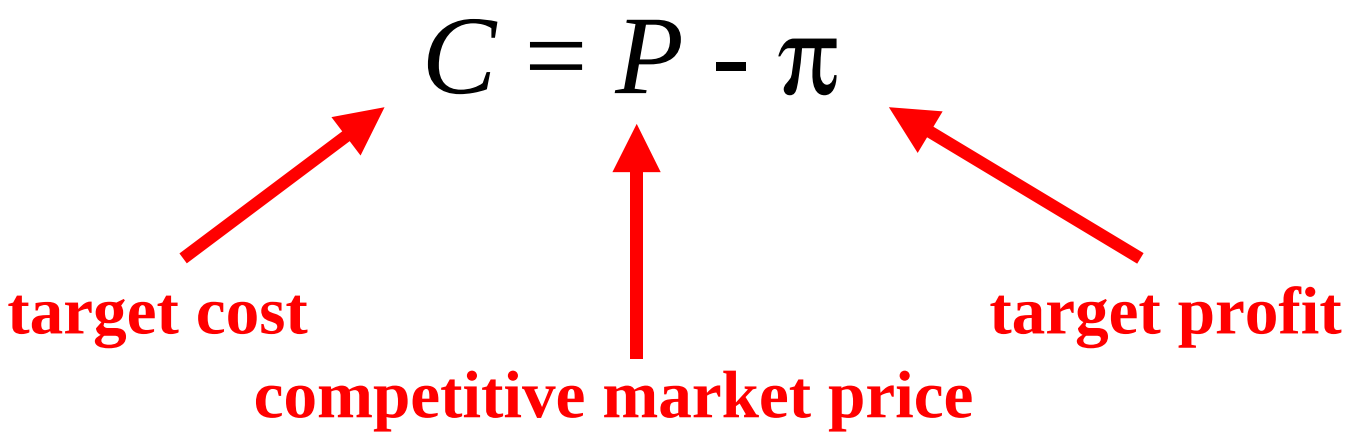
- **HP DeskJet Printer:**
  - **"Develop a laser quality printer for under $1,000 retail."**

Target Cost Definition

- **Target costing is a system of profit planning and cost management that is:**
  - **Price led**
  - **Customer focused**
  - **Design centered**
  - **Cross functional**
  - **Life-cycle oriented**
  - **Value-chain based**

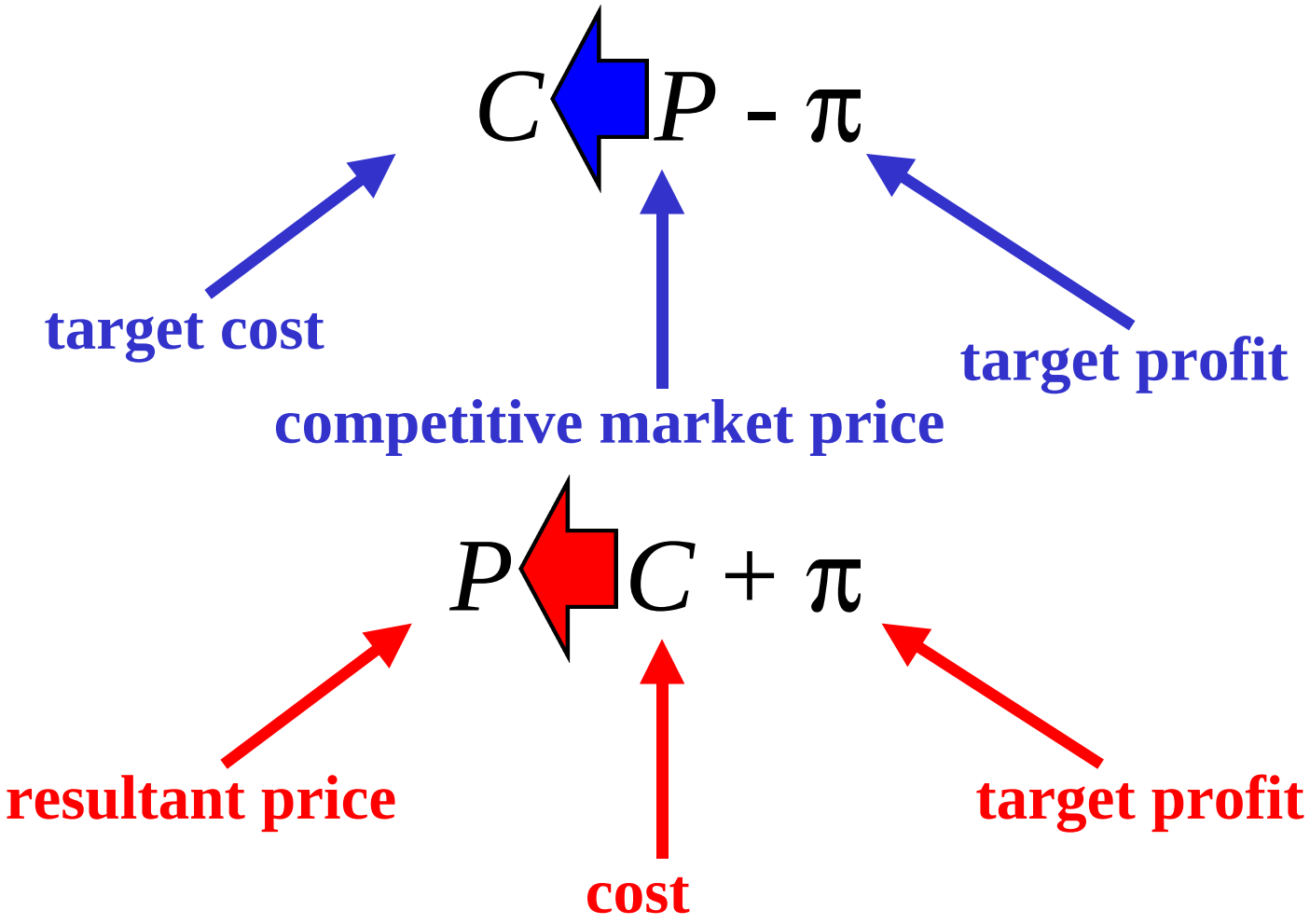
Price Led Costing

- **Cost targets are set by subtracting the *required profit* margin from the *competitive market price***
  - **Market prices define *product and profit plans***
  - **The process is driven by active *competitive intelligence and analysis***



“Cost Plus” vs. “Price Minus”

- **Algebra does not imply finance**
- **Two fundamentally different paradigms**



Focus on Customers

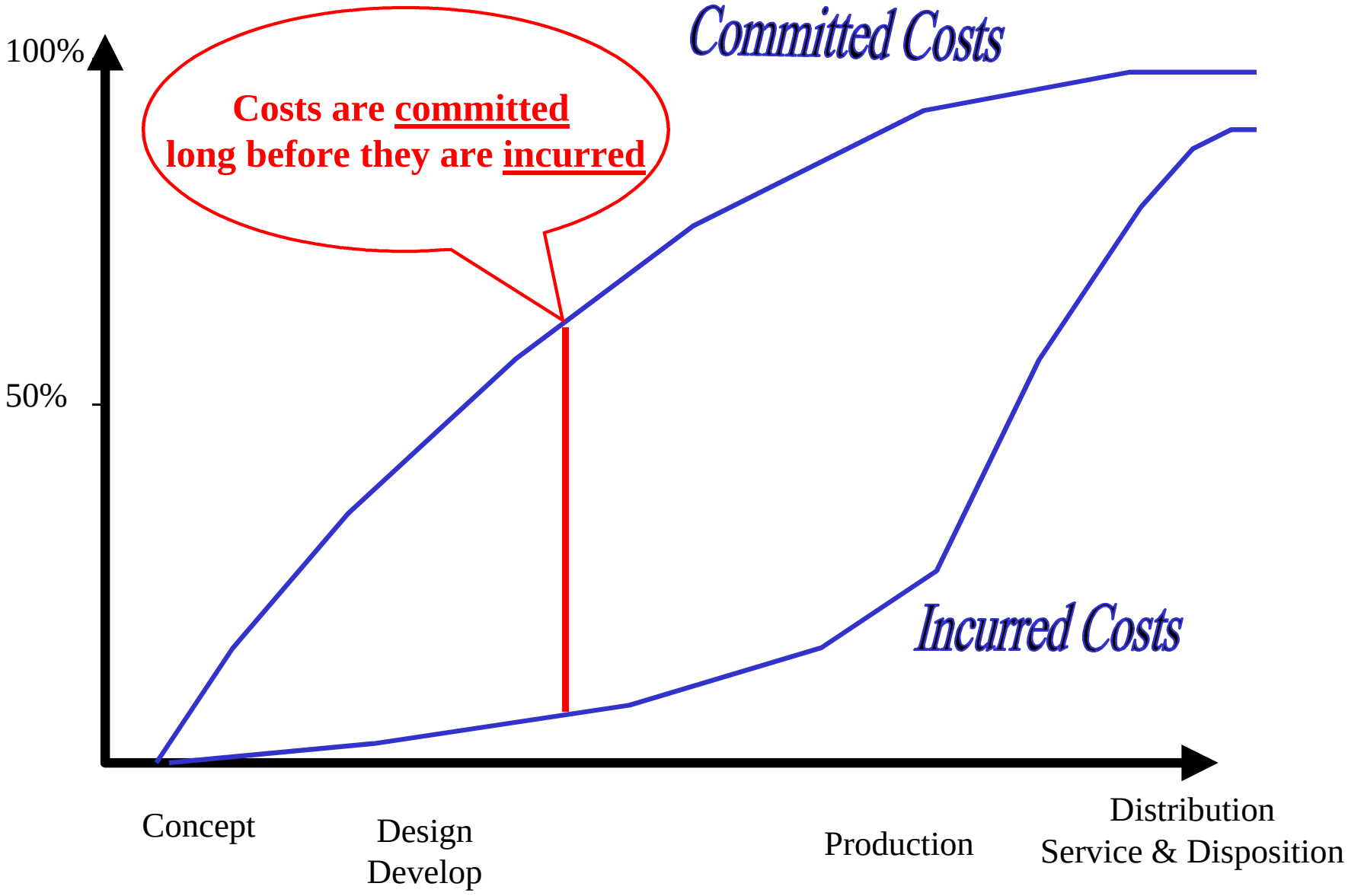
- **The *"Voice of the Customer"* is paramount and represented continuously throughout the process**
  - **VOC is an applicable tool**
- **Customer requirements for quality, cost , and time are simultaneously incorporated in product and process decisions and guide cost analysis**
  - **Quality Function Deployment is an applicable tool**
- **Product feature and function enhancements take place only if:**
  - **they meet customer expectations**
  - **customers are willing to pay for them**
  - **the additions enhance market share or sales volume**

Focus on Design

- **Product and process design is key to cost management**
  - **Manage costs *before* they are incurred rather than *afterward***
  - **Challenge engineers to look at cost impact of designs**
    - "*state-of the-market*" technology vs.
    - "*state-of-the-art*" technology
  - **All functional representatives should examine designs before production**
  - **Simultaneous engineering of products and processes**
  - **Process Management is a relevant tool**

... in short, the IPPD approach!

Cost Profiles for Manufacturers



Cross-Functional Involvement

- **Integrated Product and Process Teams (IPTs)**
- **Interdisciplinary:**
  - **design and manufacturing engineering**
  - **production**
  - **sales and marketing**
  - **materials procurement**
  - **cost accounting**
  - **service**
  - **support**
- **Include "outside" participants:**
  - **suppliers**
  - **customers**
  - **dealers**
  - **distributors**
  - **service providers**
  - **recyclers**
- **Supporting infrastructure**

Note: The most common failing of IPTs is unbalanced representation

Life-Cycle Orientation

- **Goal is to minimize the life cycle costs for both the customer and the producer**
  - **buying, operating, using, repairing, disposing**
  - **development, production, marketing, distribution, support, service, disposition**

Value Chain Involvement

- **Diffuse cost reduction efforts throughout the "value chain" [i.e., the full multi-tiered set of suppliers] by developing a collaborative relationship with all members of the "extended enterprise"**
- **Involve suppliers in design**
- **Long-term and mutually beneficial relationships**
- **Characterize the value chain:**
  - **Nature and number of suppliers**
  - **Distance from the producer**
- **Expected Contributions**
  - **Better focus on customer requirements**
  - **Provide input and ideas early in the concept formation stage**
  - **Eliminate non-value-added activities**
  - **Pursue standardization**

Enterprise Applicability - Products

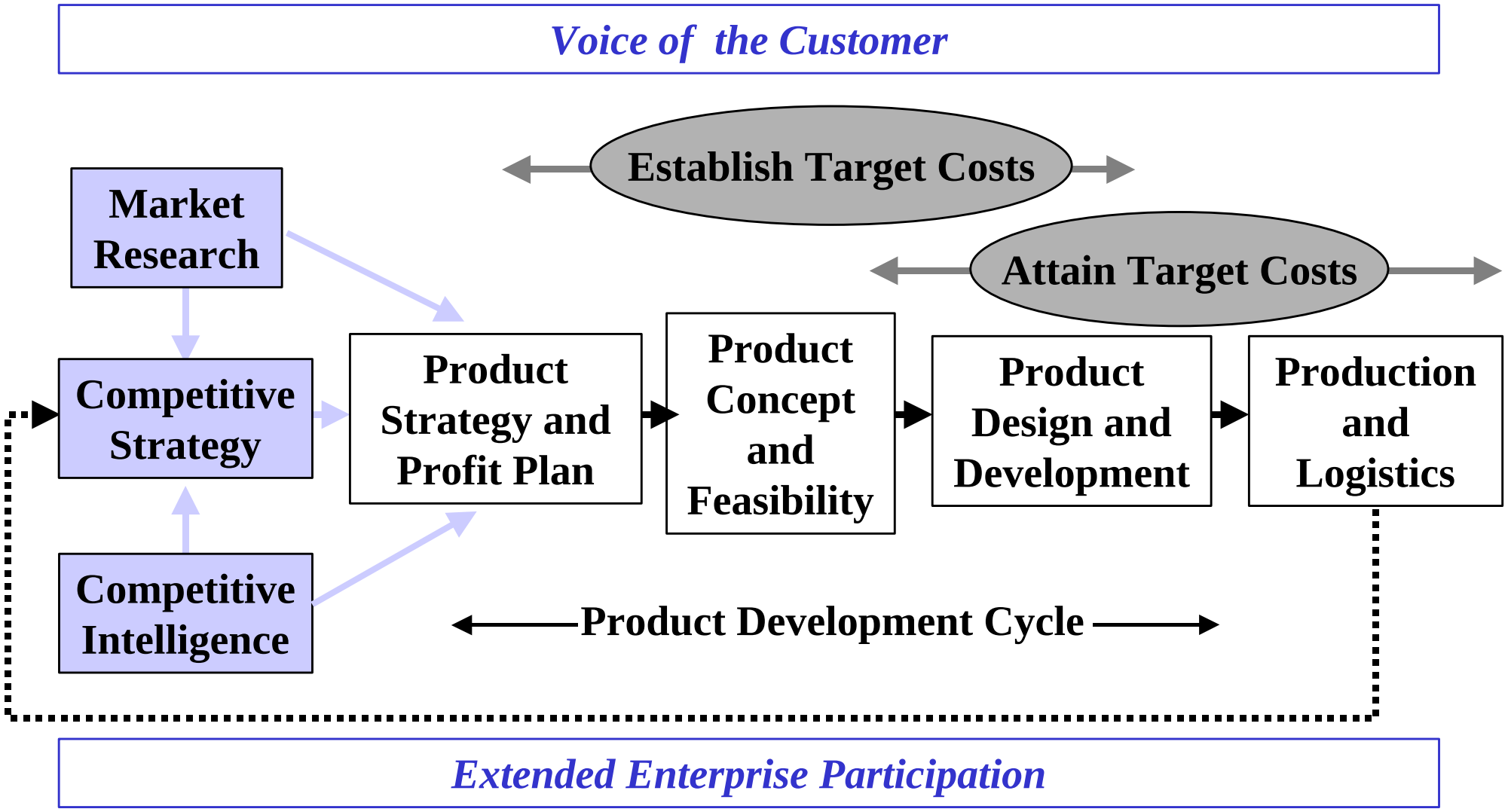
- **Well suited for:**
  - **High product complexity**
  - **Incremental innovation**
  - **Long development cycles**
  - **Large investments**
  - **Horizontal integration**
- **TC increases the importance of Systems Engineering as the design departs farther from the traditional**
- **TC is neither easily, nor quickly done**
- **TC strategy must pervade the organization**
  - **It's not a religion, but it is a discipline!**

Enterprise Applicability - Industries

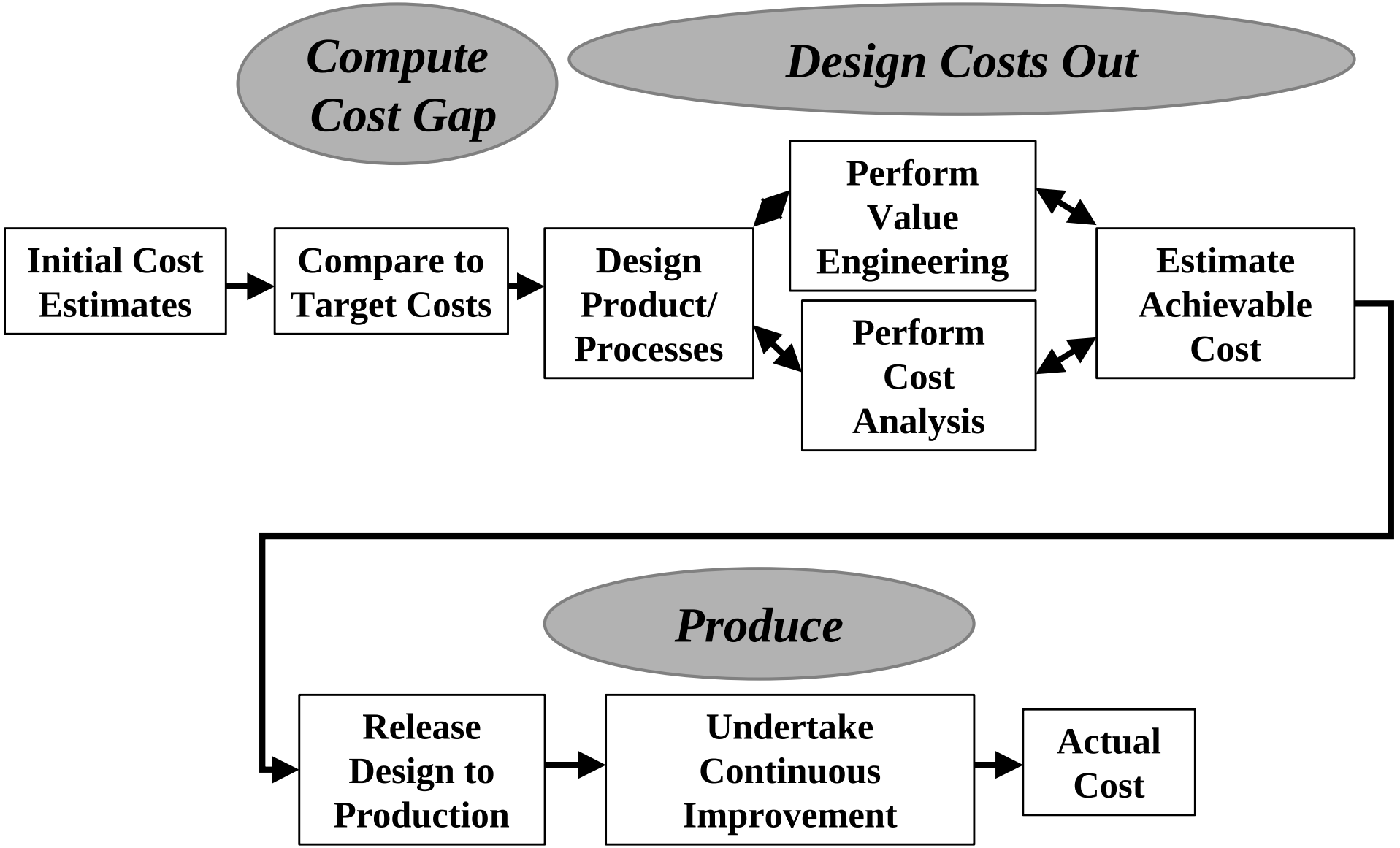
- **Usage by industry (in Japan)**
  - **Transportation equipment** **100%**
  - **Electrical/electronic** **88%**
  - **Machinery** **83%**
  - **Finished materials** **31-67%**
- **Industry leaders (in the U.S.)**
  - **Boeing, Chrysler, Caterpillar, etc.**

The Target Cost Methodology

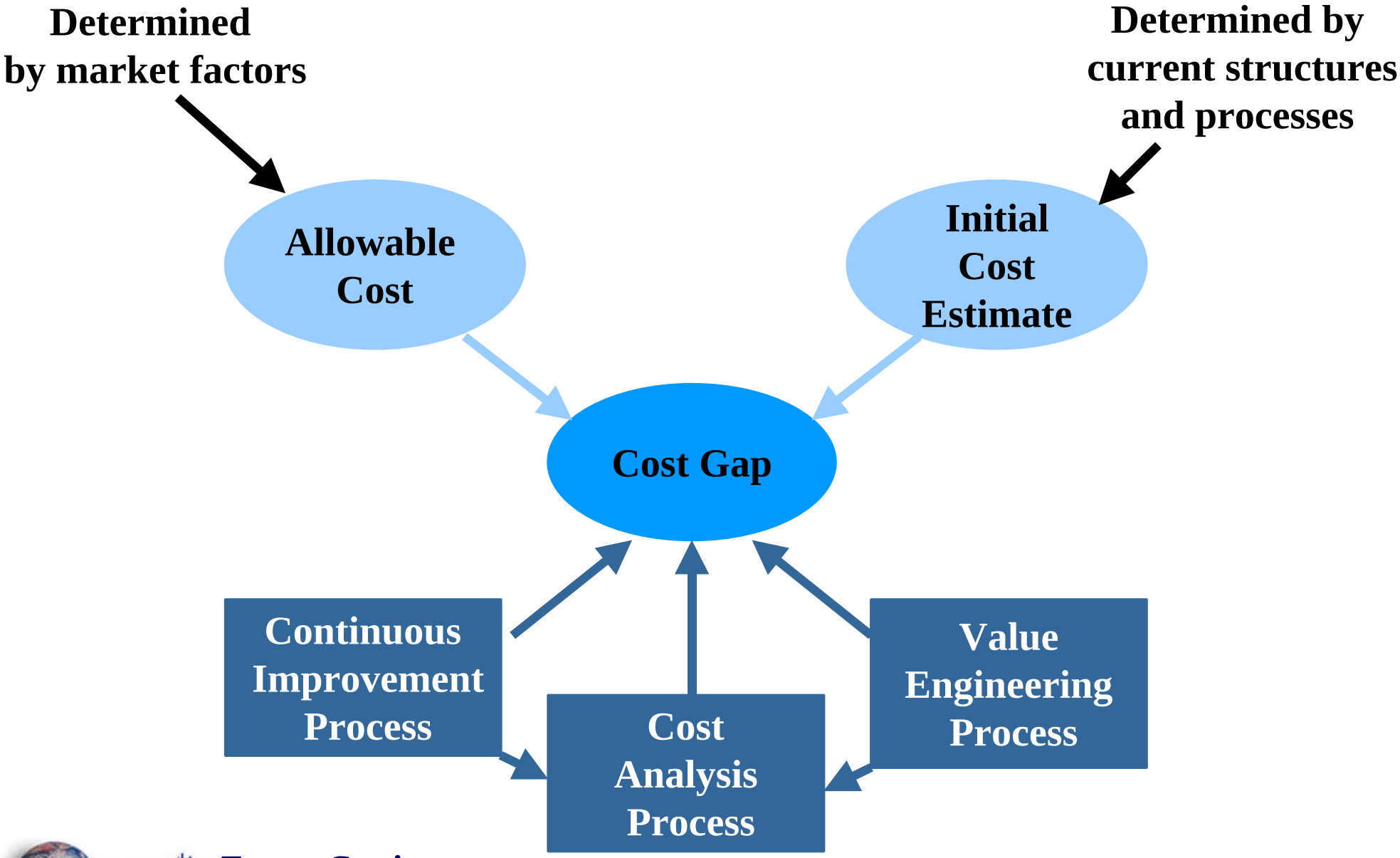
Target Costing in the Product Development Process
The Core CAM-I Model



Attaining Target Costs



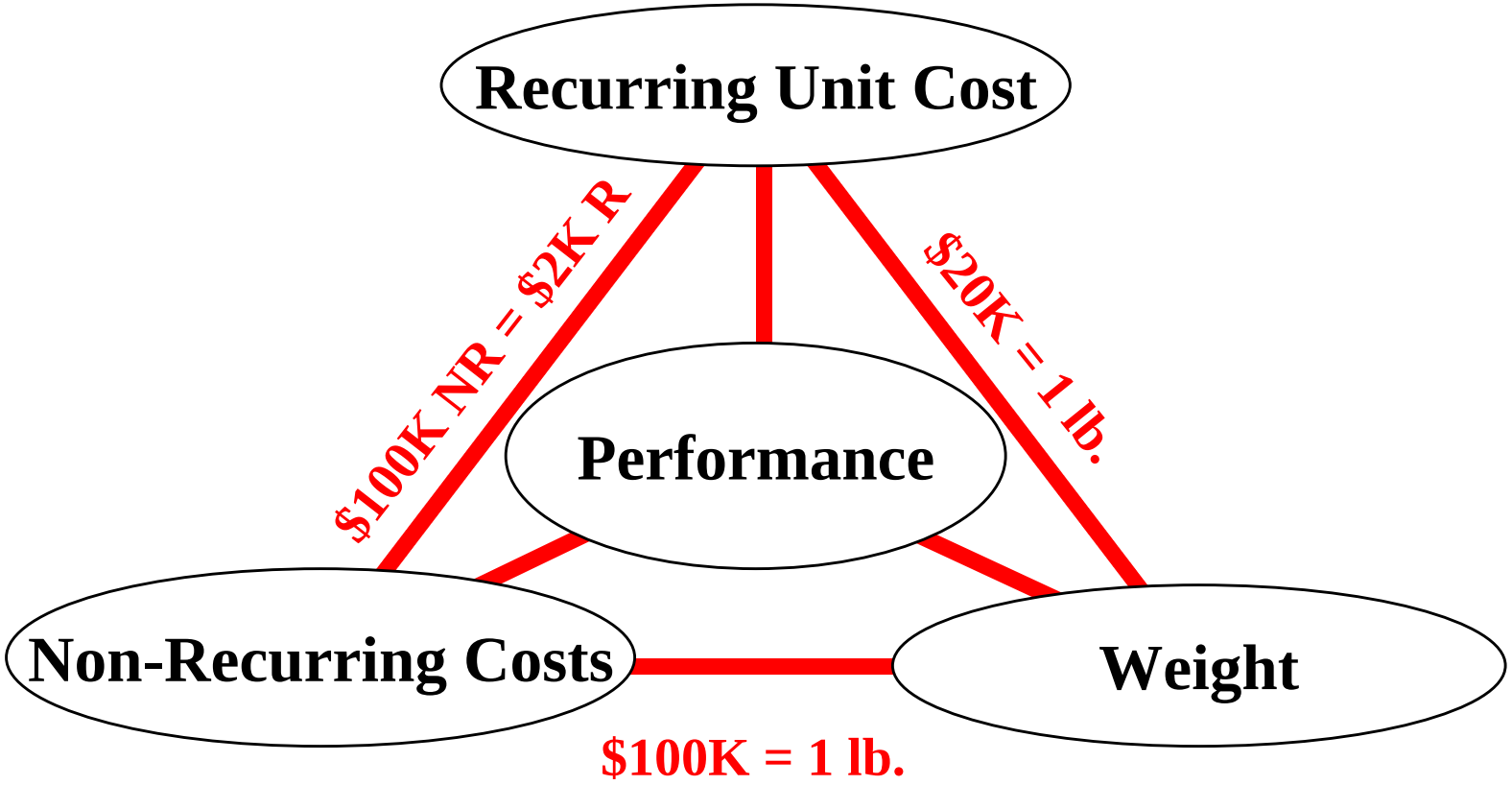
Cost Planning in TC



Target Costing
(Ansari, Bell)

Balance of TC Goals

The proper balance of values must be achieved



The interactions of variables must be watched

Results of Target Costing

TC Results

- **Is the result from TC of the order of magnitude needed for CAIV & TOC? Some examples:**
  - **Japanese TC:**
    - Up to 13-17% continuing annual cost reduction
  - **Rocketdyne RS-68**
    - 50% Production Unit Cost reduction
    - 65% non-recurring cost reduction
    - 60% time to market reduction
  - **Boeing Scandanavian Belly loader**
    - 72% cost reduction
  - **Boeing 757-300**
    - 43% cost reduction
  - **Mercedes-Benz M-Class**
    - 12% minimum ROI achieved

Answer: It *is* on the *scale* needed

Target Cost (and thus TOC/CAIV) In Practice

TARGET COSTING

Best Practices Study

Researchers

Dr. Shahid Ansari, California State University Northridge
Dr. Jan Bell, California State University Northridge
Dr. Il-Woon Kim, University of Akron
Dr. Dan Swenson, Idaho State University

Statisticians

Peter Braxton, Navy ACE
Richard Coleman, Navy ACE

Study sponsors:

Consortium for Advanced Manufacturing - International (CAM-I)
American Institute of Certified Public Accountants (AICPA)
The University of Akron, Ohio

Target Cost Survey

- http://www.cam-i.org/TC/index.html
- CAM-I Target Costing Best Practices Survey
  - One component of Target Costing Best Practices Study
  - Study also included site visits to American and Japanese companies
  - Final report issued March, 1999
- 120 Respondents:
  - 48 “Adopters”
  - 72 “Non-Adopters”
- Company information (confidential)
- 34 multi-part questions, many “one through five” type
  - Not Important, … , Very Important
  - Strongly Agree, … , Strongly Disagree

Survey Form

TARGET COST -- BEST PRACTICES SURVEY

Sponsored by:

The Consortium for Advanced Manufacturing - International
The American Institute of Certified Public Accountants
The University of Akron, Ohio

RESPONDENT INFORMATION

Company Name _____

Name of person completing survey _____

Title _____

Survey - Statistical Analysis

- **Statistical analysis by Peter J. Braxton, Heather F. Chelson, and Richard L. Coleman**
  - **t test for difference of means**
  - **chi square test for difference of “profiles”**
  - **sign test for significance of trends**
  - **Spearman and Kendall tests for correlation**
  - **alpha = 0.05**

Survey Results Legend

SS = Statistically Significant

C
C = Correlation

N = No Correlation

 = Aerospace and Defense (statistically significant)

 = Chart (supporting graphic)

Who Are They?

Characterization of Respondents

Respondents and Their Companies

- **Primarily Finance [51%] and Engineering [20%]**
- **Primarily representing Division [33%] or entire company [36%]**
- **Primarily from Aerospace & Defense [20%], Electrical/Electronics [16%], and Other [21%]**
- **Aerospace & Defense single biggest Adopter category [30%]**

SS

- **Different "production profiles," with Adopters favoring Fabrication or Assembly [68%] and Non-Adopters favoring Process Manufacturing [44%]**

SS

- **Large business units (2000+), with Adopters coming from units of larger average size**

Business Environment

SS
- **Adopters face a more competitive environment when in comes to producing "better, faster, cheaper" products, placing more importance on**
  - **beating competitors to market with new products**
  - **providing more and better features**
  - **providing more reliable, longer-lasting products, and**
  - **providing the lowest priced products**

SS
- **Adopters come from high-profile industries:**
  - **higher rate of growth of industry sales**
  - **higher barriers for competitors to enter market**
  - **greater reliance on highly skilled production work force**
- **Both Adopters and Non-Adopters face competitors who offer similar products**

Customers

SS

- **Adopters had more loyal and sophisticated customers:**
  - **greater customer loyalty**
  - **greater ability of customers to detect differences in product quality and functionality**
  - **greater ability of customers to articulate future requirements**
- **No difference in rate of change of customer tastes**

Corporate Values

- **Values of teamwork and continuous improvement important at both the corporate and business unit level**

SS

- **Adopters showed trend of valuing innovation more at the business unit level**
  - **Also greater willingness to experiment with new ideas**

SS

- **Adopters solicit and implement employee suggestions more on the corporate level**
  - **corroborates site visits**

- **Aerospace and Defense Adopters valued teamwork more than Non-Adopters at both the corporate and business unit levels**

Cycle Time

- **Product development times fairly short [75+% under 3 years]**
- **Adopters have slightly longer product development times, slightly shorter modification and redesign cycles**

- **Aerospace and Defense Adopters have longer average product development times than other Adopters**

What Do They Do?

The Six Key Principles of Target Costing: Practicing What They Preach

Key Principles of Target Costing

• Price-led costing		No clear difference
• Customer focus	SS	Adopters more customer focused
• Design driven	SS	Adopters start costing in design
• Cross-functional	SS	Adopters use teams more
• Life-cycle costing		No overwhelming difference
• Value chain	SS	Adopters involve suppliers more

Pricing Methods

- **Traditional methods (i.e., cost plus profit margin) most prevalent in pricing**
- **Adopters priced to beat competitor more often**
  - **Among Adopters, Aerospace and Defense even more so**
  - **Target pricing?**
  - **Price-led costing method, with competitor's prices serving as short-cut to market research?**
- **Are Adopters really treating Cost As an Independent Variable?**

Customer Relations

SS

- **Adopters showed more customer involvement:**
  - **seeking customer input during the design phase**
  - **collecting customer data using formal methods**
  - **analyzing and disseminating this information throughout the company.**

Value Chain

SS • **Adopters showed trend of greater supplier involvement**

SS • **Adopters had greater coordination with suppliers on both product and process design**

SS • **Adopters had greater internal cooperation**

SS • **Adopters had input from dealers and resellers on both design and customer requirements**

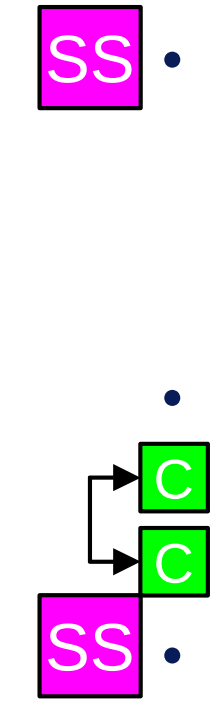
Cost Estimating

- **Adopters included cost estimates for all elements and phases at least as often as Non-Adopters**
- SS **Adopters estimated Pre-production Costs and Distribution and Logistics Costs more often**
- SS **Adopters estimated Concept Development costs more often**
- **Only area in which Adopters did not outstrip Non-Adopters was in estimating Disposal costs**

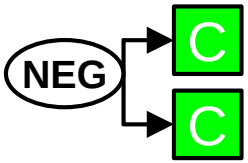
Why Don’t They Do It (Better)?

Barriers to Implementing and Improving Target Cost

Barriers to Target Cost



- **Non-Adopters cited:**
  - **lack of familiarity with Target Cost**
  - **perceived irrelevance of Target Cost**
  - **presence of more pressing problems**
- **Non-Adopters also cited:**
  - **lack of resources to implement**
  - **importance of other initiatives**
- **Adopters cited negative impact of missing targets**
- **Adopters also cited inverse problem of no rewards for achieving targets**
- **Buy-in by top management is crucial:**



  - **Lack of top management support**
  - **Increased overall profitability [main benefit]**

How Do They Do It?

Target Costing Tools and Practices

Implementation of Target Cost

- **The maturity of Adopters was bimodal:**
  - **about one fourth over 5 years**
  - **about one half 1-3 years**
- **Decision to implement Target Cost made at various levels**
  - **Corporate, Group, Business Unit**
- **Depth of implementation varies**
  - **One or certain products, up to corporation-wide**
- **No “incorrect” formulae for setting target costs (i.e., all were variants of subtracting desired profit margin from price to determine cost)**

TOOLS

Target Costing Tools [1]

- **Cross-functional teams (IPTs) for problem solving**
  - **Single most used tool**
  - **Correlated with all other tools**
- **Multi-year product & profit planning**
- **DTC (cost objectives, goals, and thresholds throughout)**
- **DFMA (optimize interactions)**
- **Continuous Improvement activities (*Kaizen*)**
- **TQM**
- **Benchmarking**
- **Value Engineering (includes performance trades)**
- **Competitor cost analysis**
- **QFD (document and understand requirements)**

Listed from most used to least used

Used significantly more by Aerospace & Defense

Trend of Adopters using all 13 tools more!

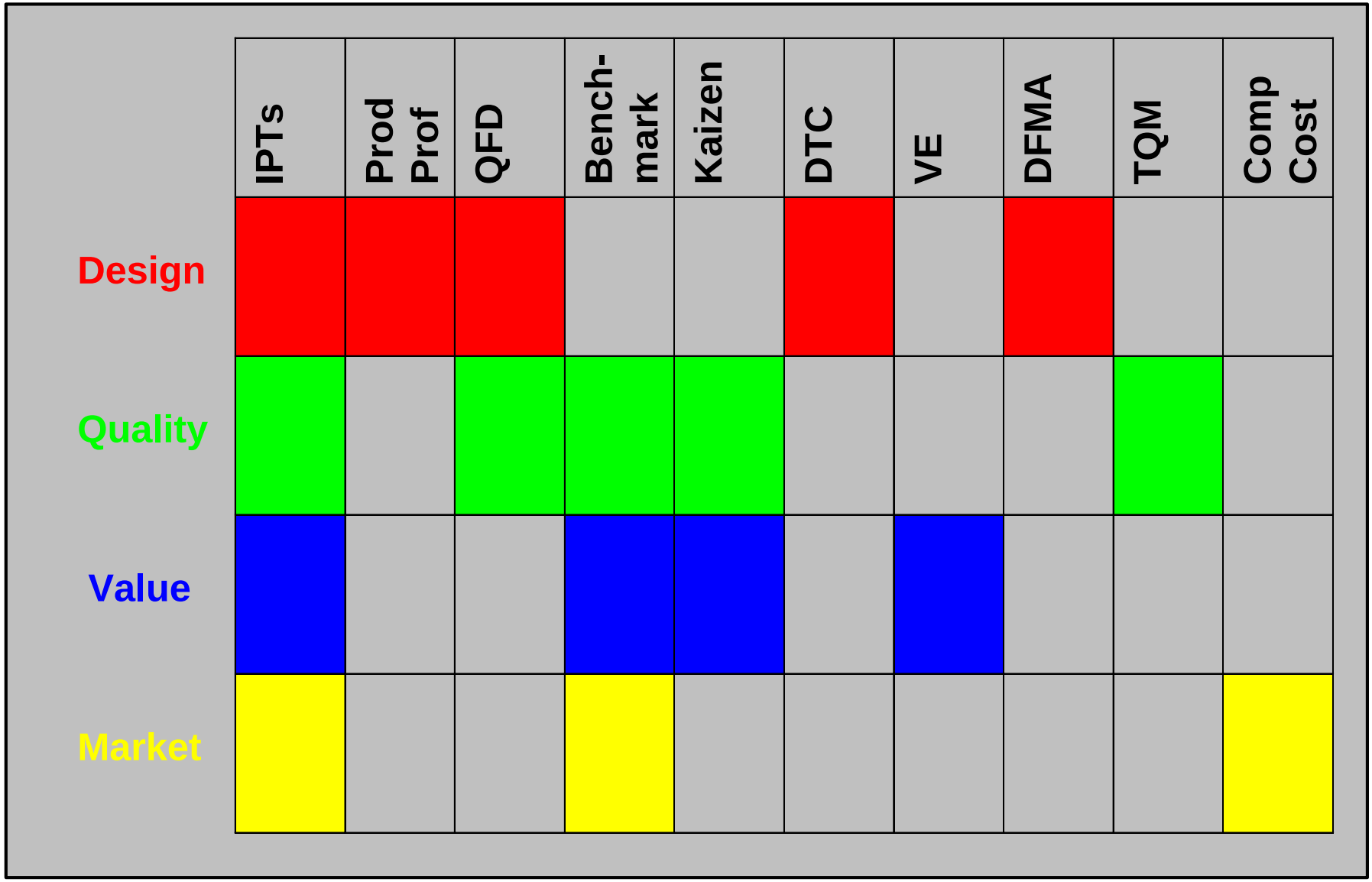
Target Costing Tools [2]

- **Certain tools did not show significant differences between Adopters and Non-Adopters, nor were they correlated strongly with other tools:**
  - **Activity-Based Costing/Management (ABC/ABM)**
  - **Cost tables**
  - **Tear down analysis/Reverse engineering**

Used significantly less by Aerospace & Defense

- **Integrated Data Environment (IDE) was *not asked* on the survey**
  - **PEO(ARBS) IDE survey offers some insight**
- **No correlation between tools and maturity**

Tool Families for Target Costing



Supplier Involvement

- **Two thirds of Adopters mandated targets for suppliers, though often only for critical or costly parts**
- **Supplier training less prevalent**
  - **half of Adopters provide instruction in Value Engineering, fewer in other areas**
- **No American equivalent of *Keiretsu***
- **Supplier integration still an area for improvement**

Target Cost Teams

- **Teaming is vital to Target Costing**
- **Team participation** 
  - **Design Engineering**
  - **Operations/manufacturing**
  - **Accounting/Finance**
  - **Purchasing**
  - **Product Planning**
- **Uneven participation in teams seems to be a problem at this time**
- **Those who participate most seem to regard the process as most successful**

Aerospace and Defense has more involvement from Operations/Manufacturing, less from Sales/Marketing.

Sophistication of Target Costing

- **Most Adopters establish targets for all models in product line [60%]**
- **Most Adopters establish targets for all parts and sub-components of the product [59%]**
- **Almost all Adopters establish targets for development, direct materials, and purchased parts [80+%]**
- **Most Adopters did *not* establish targets for distribution and logistics, selling, and service and support costs**

Monitoring of Targets

- Adopters report thorough monitoring of cost targets
- When targets are missed the most common responses are “quick fixes”:
  - increase the product's price
  - reduce the product's profit margin
- Adopters very rarely drop the product altogether
- Aerospace and Defense Adopters more likely to drop the product

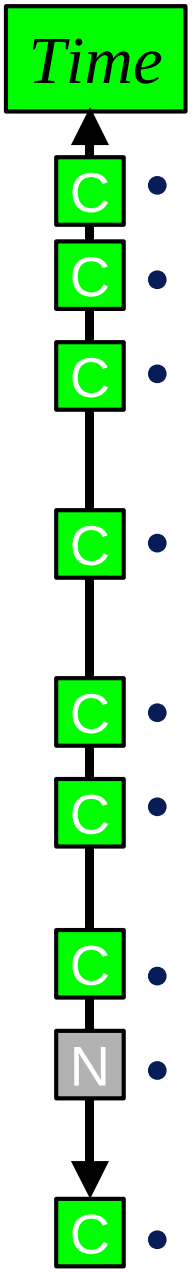
Metrics and Rewards

- **Adopters have done very little to explicitly link metrics of employee performance or employee rewards to the target costing system**
- **Any metrics put into place have yet to gain wide acceptance**

How Are They Doing?

Benefits of Target Costing

Benefits of TC



Listed from most achieved to least achieved

- **Increased overall profitability**
- **Reduced manufacturing costs**
- **Reduced the costs and new products before manufacturing**
- **Met or exceeded customer expectations for our products**
- **Reduced the cost of purchased materials**
- **Resulted in product features and functions that customers value**
- **Developed a more profitable product mix**
- **Decreased the number of design changes after production begins**
- **Reduced the time required for new product introduction**

Value Chain Benefits

- **Target Costing positively impacted the value chain:**
  - **suppliers, dealers, and retailers involved in design**
  - **improved working relations within the business unit**
  - **increased contacts and inputs with customers**

Customer relations improved more in Aerospace and Defense

Room For Improvement

- **Target Cost still relatively new to the United States, not completely understood**
  - **Possible confusion with DTC and DFM**
- ***Effective* cross-functional teaming remains a problem**
- **Price-led costing and discipline**
  - **Eliminate use of Cost Plus instead of Price Minus**
  - **Minimize relaxing of targets, drop products if necessary**
- **Supplier integration continues to be a major gap for most Adopters**
- **Little attention to "total system architecture" in terms of supportive performance measures, rewards, training and information systems**
- **Implications for cycle time unclear**

The Bottom Line

- **Even with imperfect implementation, Target Costing has (convincingly) yielded benefits to its practitioners!**

Determining the Small-Program Cutoff

How big is an ACAT III/IV in FTE?

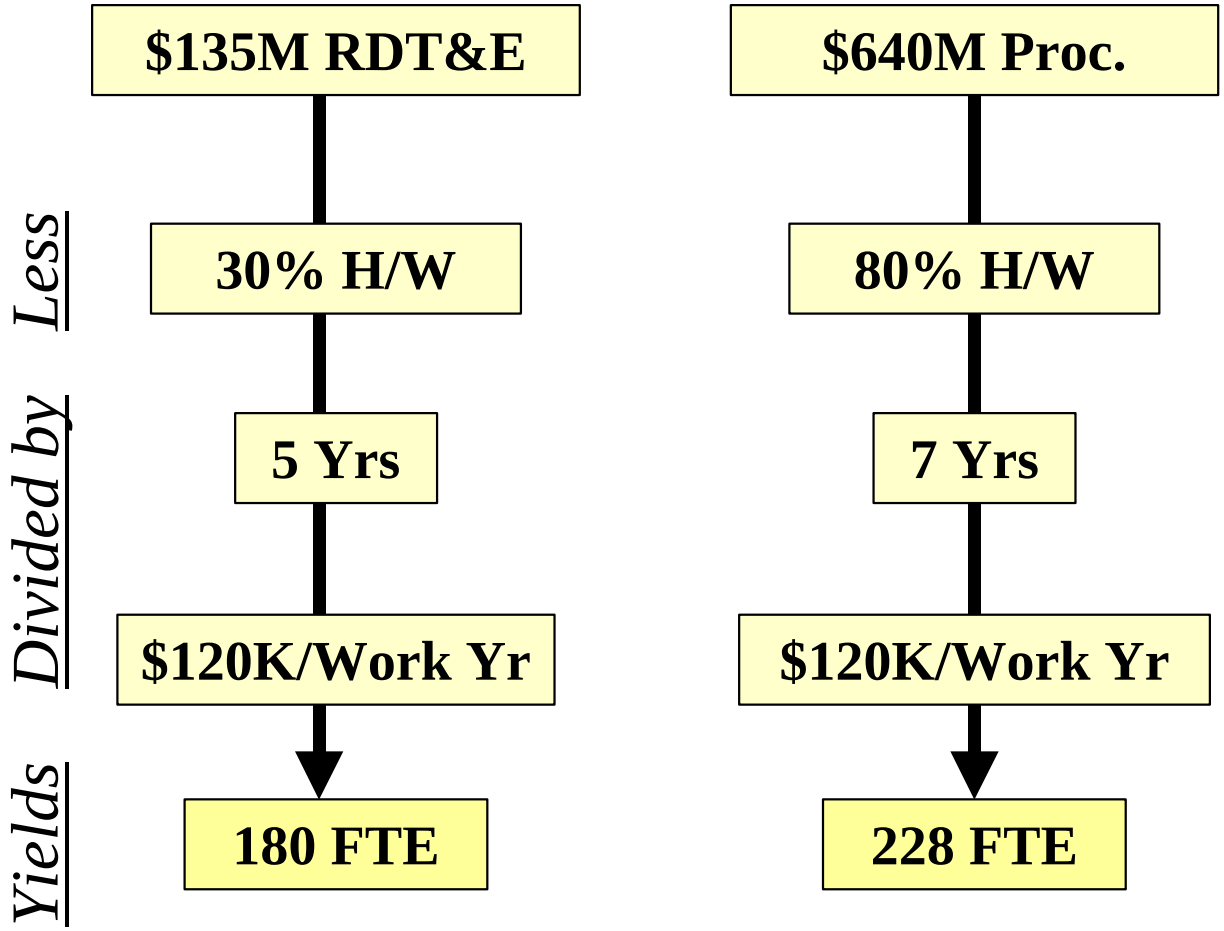
Size: ACAT II lower bound - DoD 5000 ser.

% Workforce: NCCA Standard Factors Manual, 1992

Duration: Assumption

Salary: Approximation

Answer: Workforce size



Answer: Under-200 FTE is about right for ACAT III/IV
But there were only 2 Adopters of that size
So a cutoff of Under-500 was chosen
This gave us 5 adopters - sufficient for inferences, close enough for application

SS Small Programs

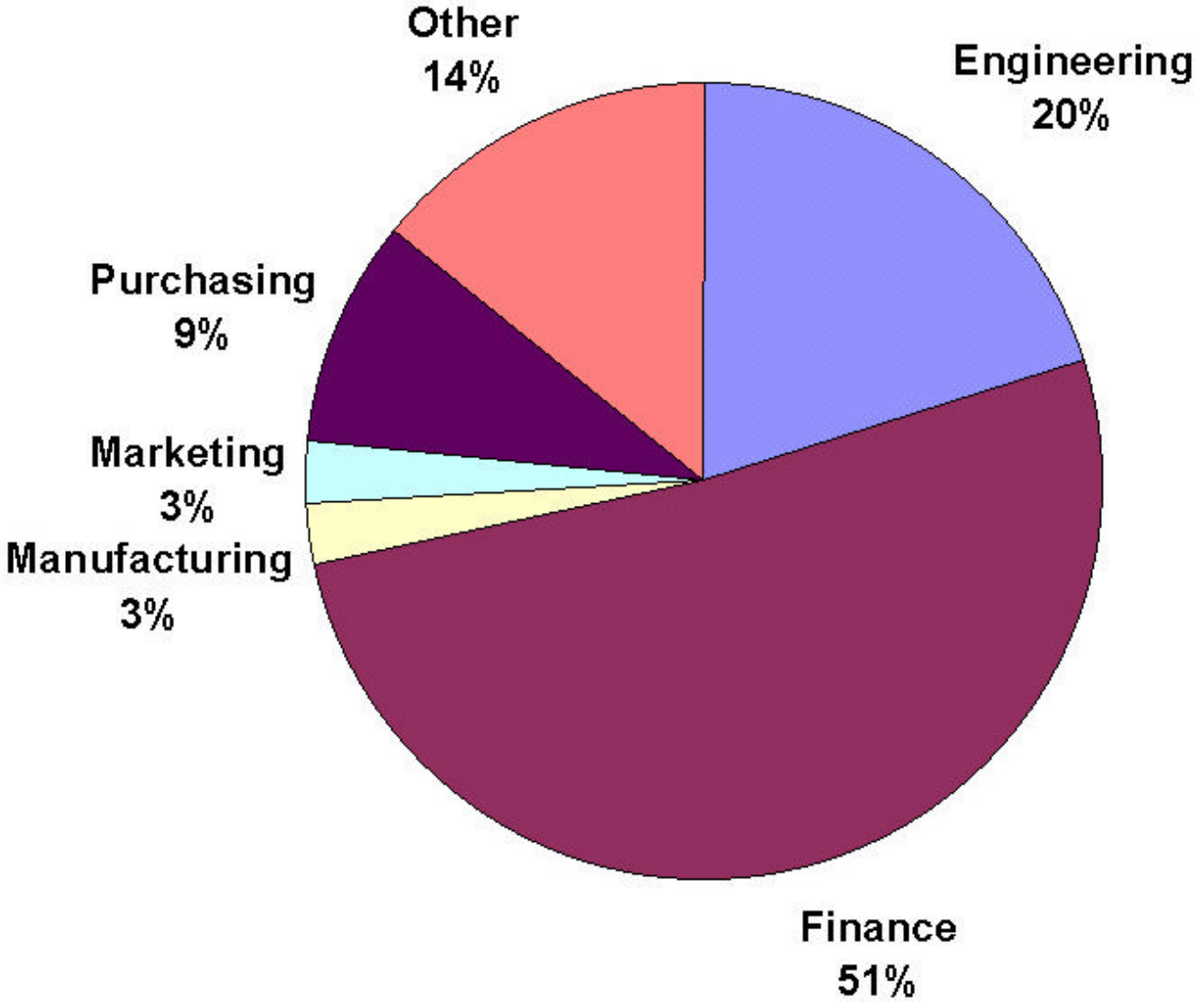
- **Business and corporate environment:**
  - **Lower market share, less pressure on profit margins, lower barriers to enter market (12adf)**
  - **Shorter product development times (4)**
  - **Greater willingness to experiment with new ideas (10a)**
  - **More pressing problems (18c)**
- **Less likely to reduce profit margin, more likely to reduce reliability/longevity (27bd)**
- **Estimate Distribution/Logistics costs more (7d)**
- **Increased role of suppliers in design (29b)**
- **More targets for purchased parts (34b)**

Where Do We Go From Here?

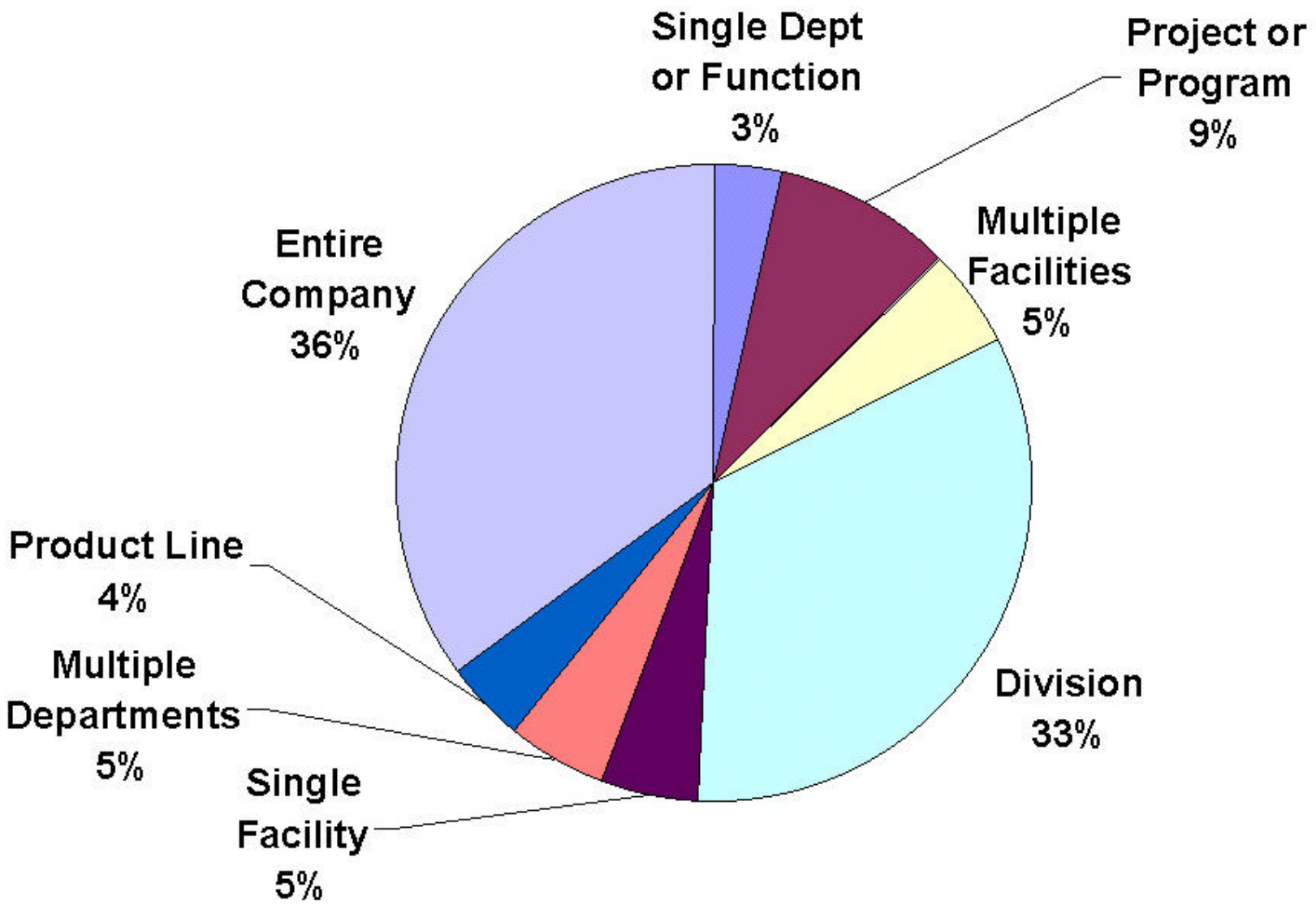
- **Implementation guidance**
  - **CAM-I Diagnostic Tool ready for release**
    - Each of three areas scored by diagnostic questions and displayed on a spider chart:
      - Principles
      - Cultural/infrastructure
      - Processes/Tools
  - **Navy ARO efforts**
    - DAU CAIV course
    - CAIV implementation policy
    - TOC and CAIV implementation guidance and training
- **References**
  - **CAM-I Target Costing bibliography (related disciplines)**
  - **Navy ARO TOC Knowledge Share Space on the Web**

Charts

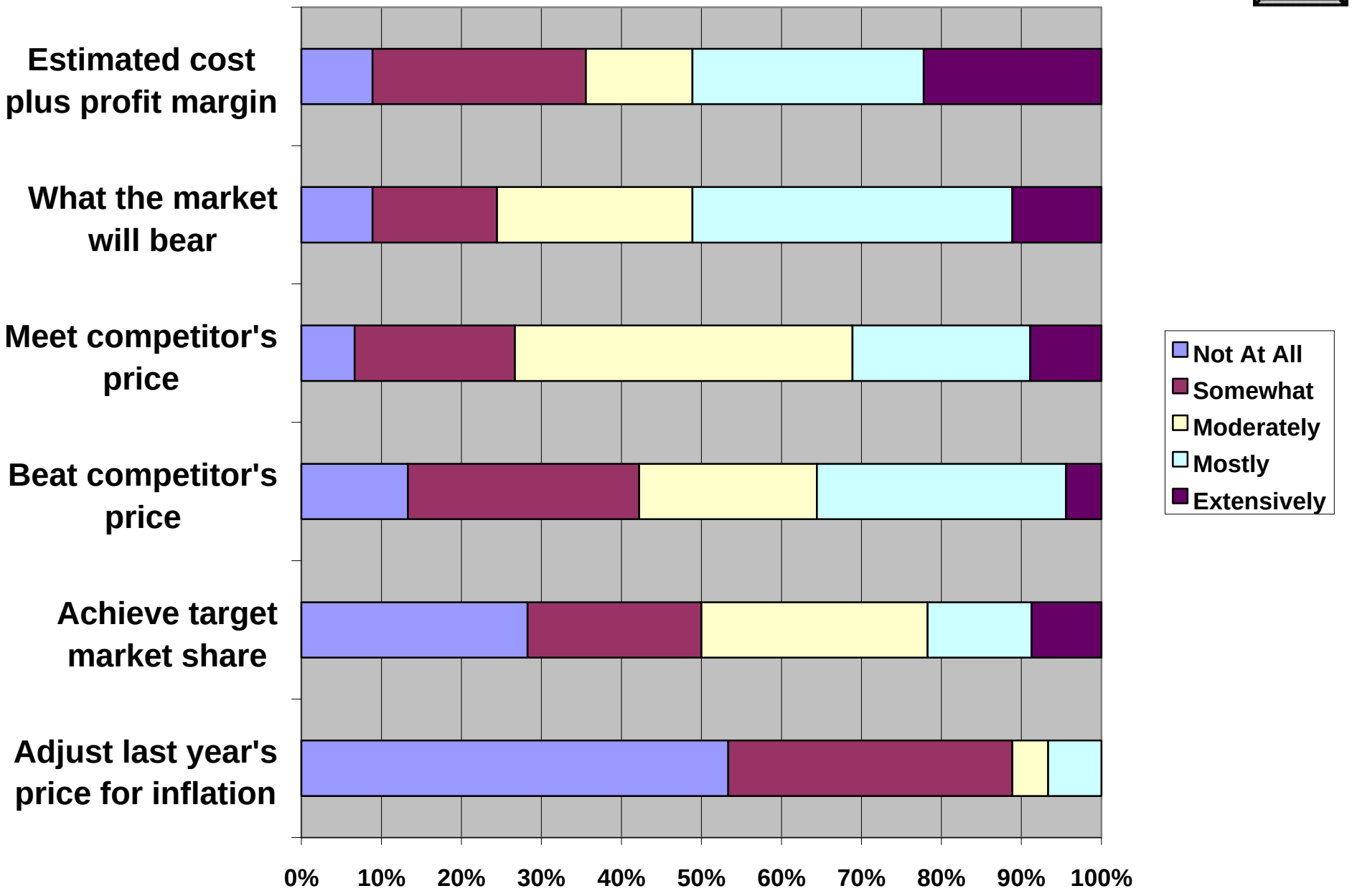
Functional Area of Respondents



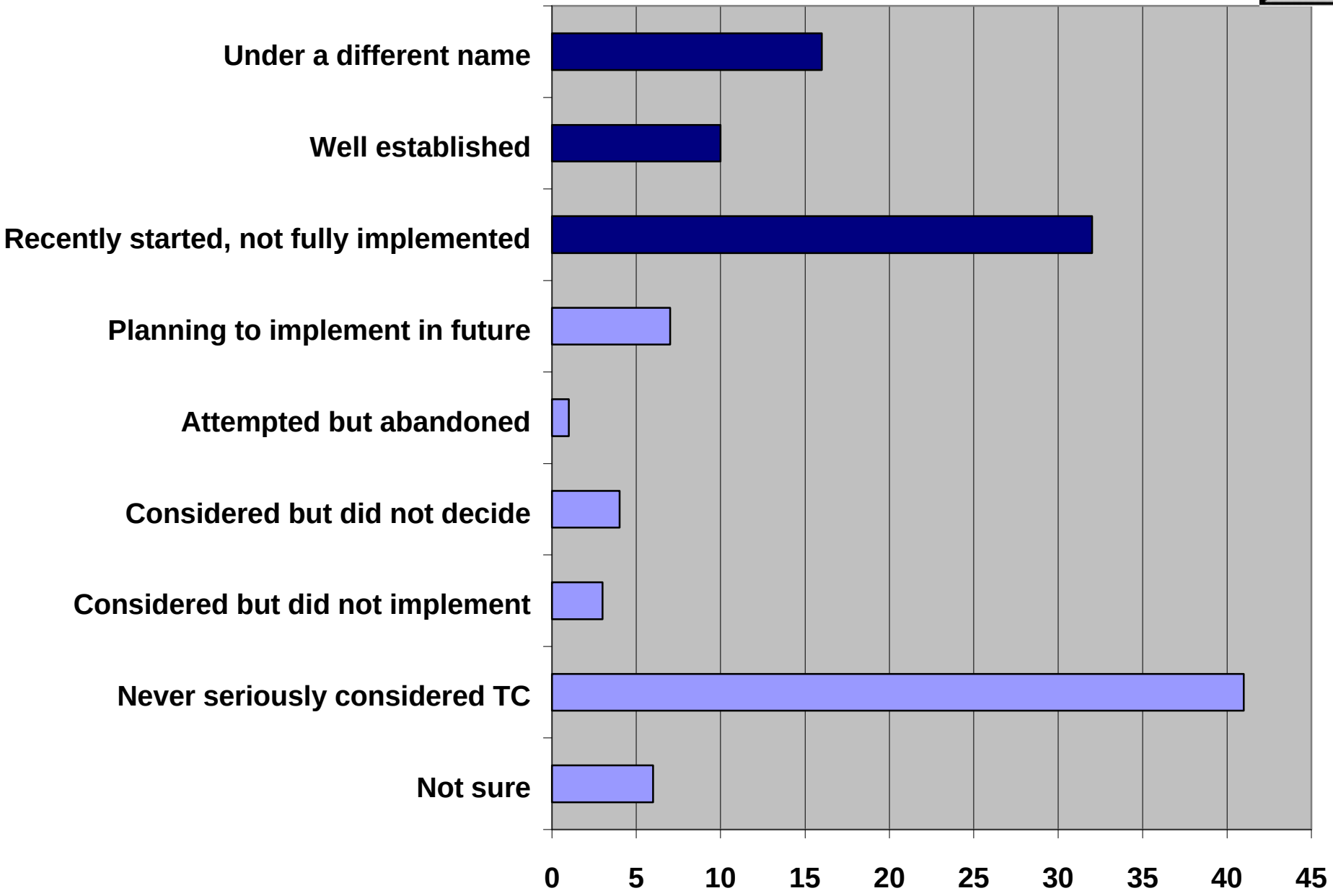
Perspective of Respondents



Pricing Methods

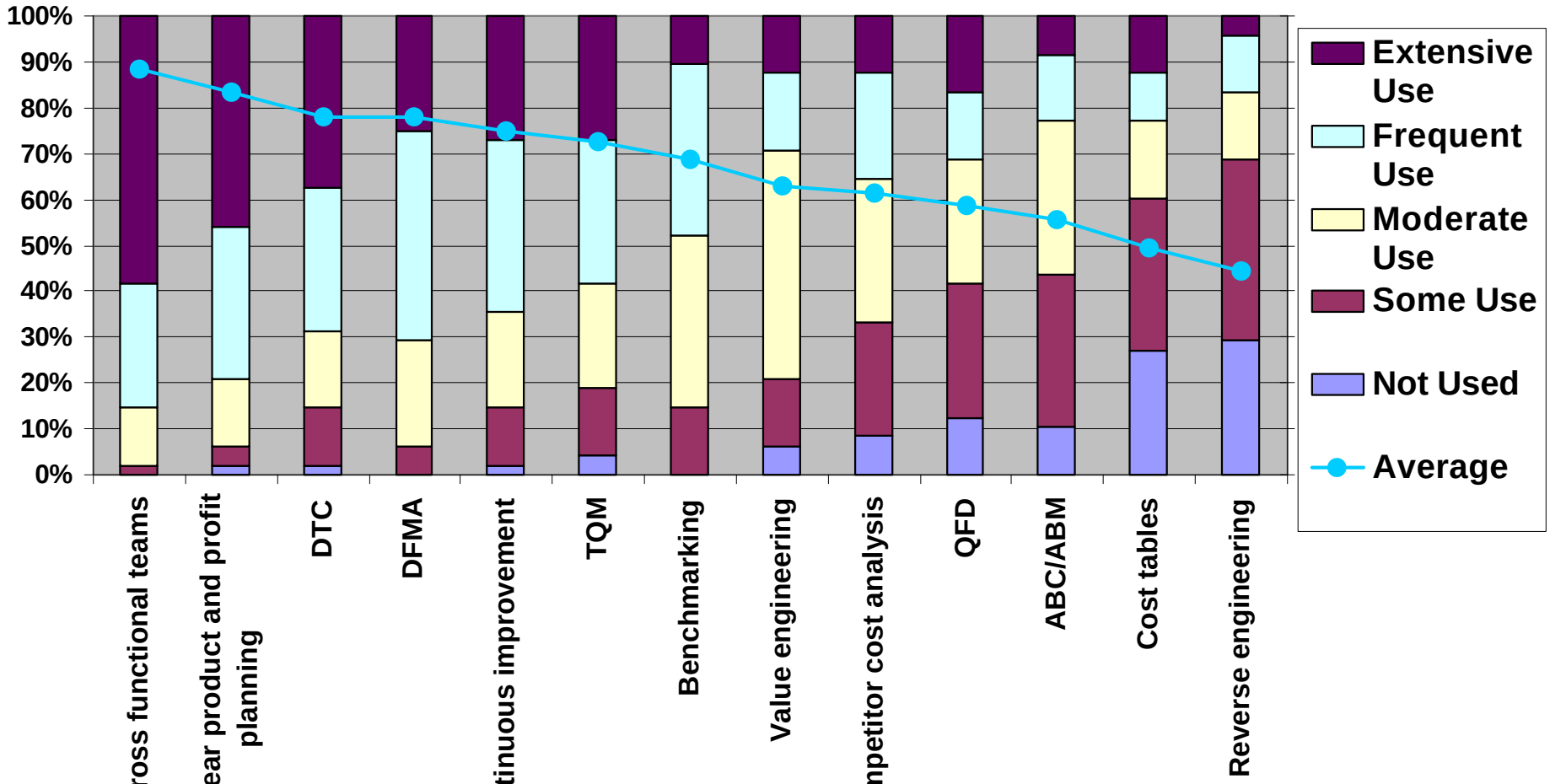


Target Cost Adoption

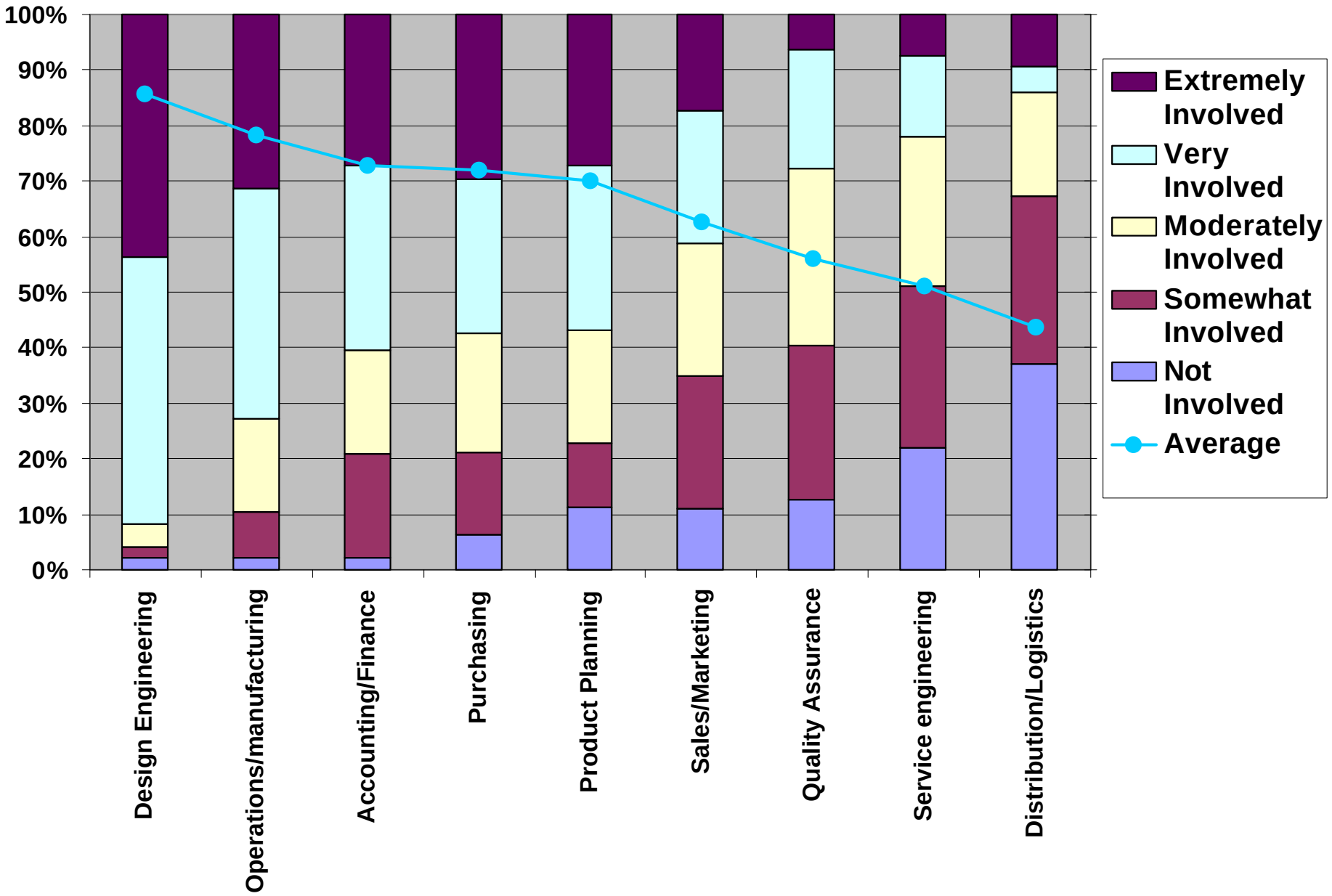


TOOLS

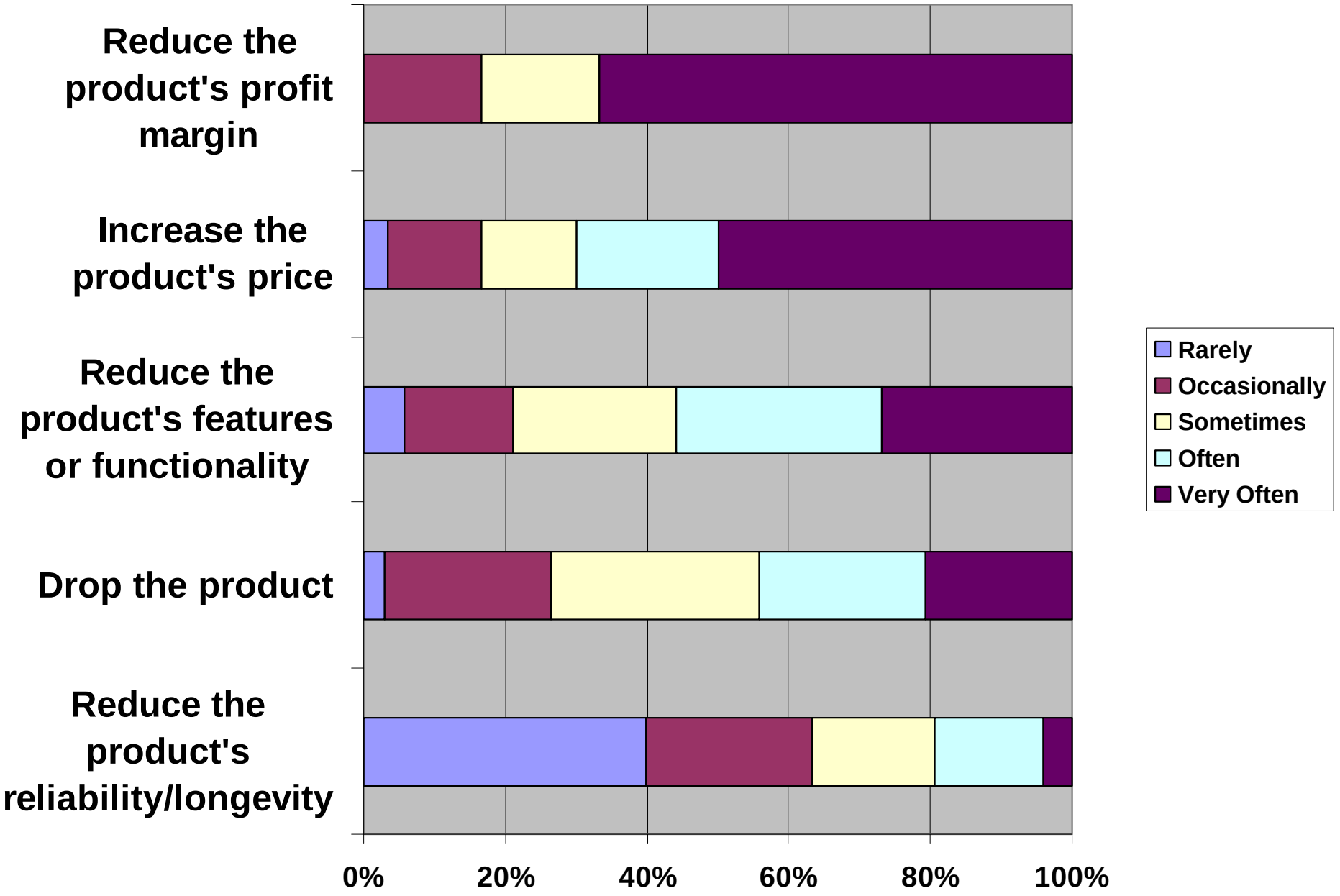
Adopter Tools



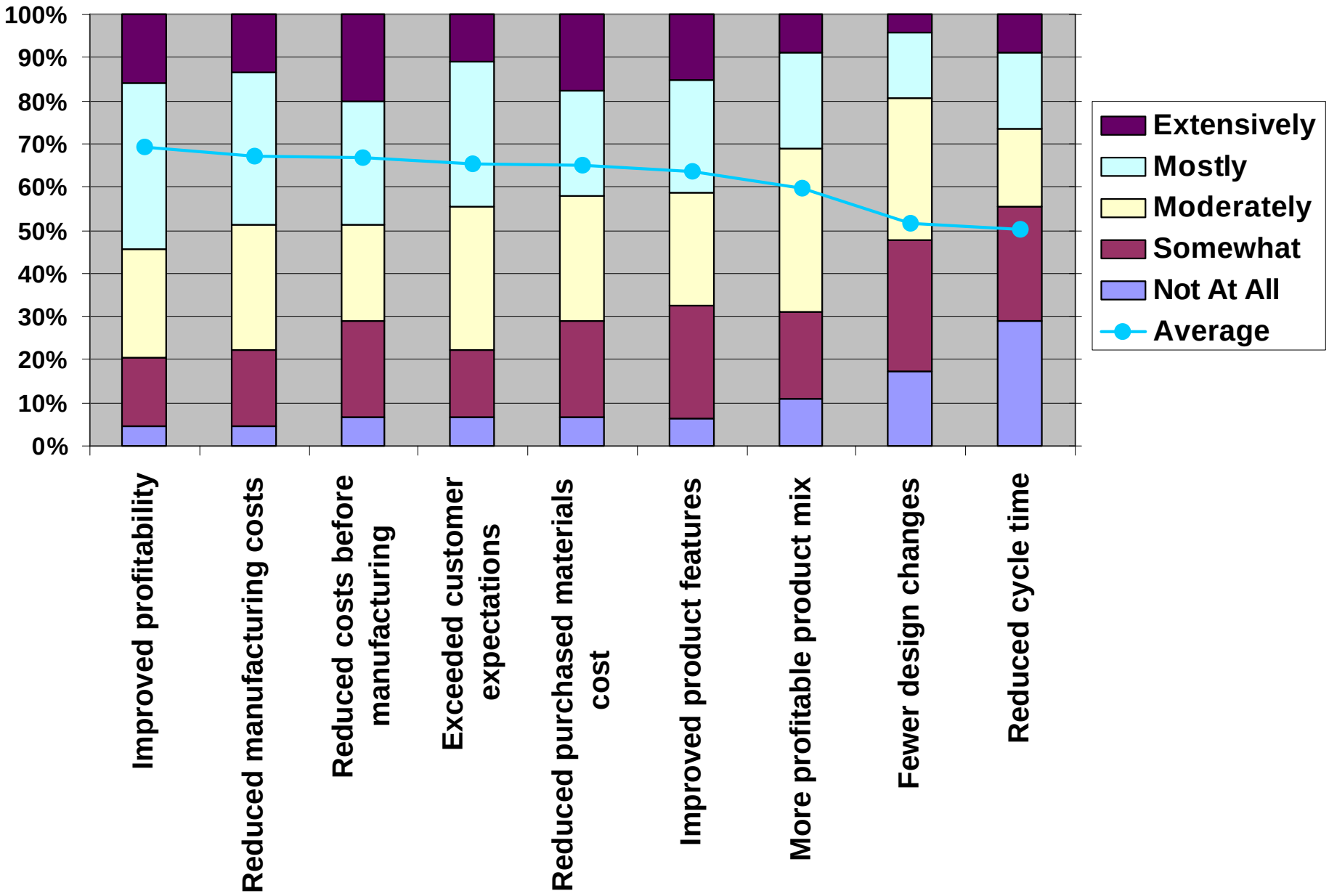
Team Involvement



Responses to Missed Targets



Target Costing Benefits



Related Briefs and Papers

- **“Implementation of an initial CAIV and TOC Process in the Navy's ACE” (Coleman, Gupta, Blackburn, St. Louis), 1998 ISPA/SCEA Joint International Conference, awarded *Best Paper on Acquisition Reform***
- **“Processes for Reducing Total Ownership Cost: CAIV and Target Costing,” 1999 ISPA/SCEA Joint International Conference**

Briefings Given [1]

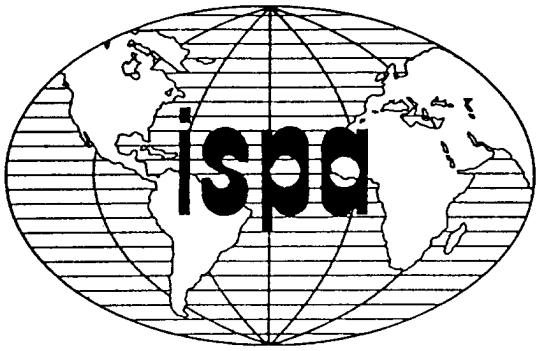
- CAPT Jeanne Vargo, Navy Acquisition Reform Office (ARO), Total Ownership Cost (TOC) Team Leader, Monday, February 22, 1999
- TOC/CAIV Workshop 99-1, Navy Acquisition Center of Excellence (ACE), Wednesday, February 24, 1999
- Mr. Mike D. Roberts, Navy Acquisition Reform Office (ARO), Cycle Time Reduction Team Leader, Monday, March 8, 1999
- DD 21 Gold Team, Wednesday, March 17, 1999
- SCEA Luncheon, Thursday, March 18, 1999

The Society of Cost Estimating and Analysis

Briefings Given [2]

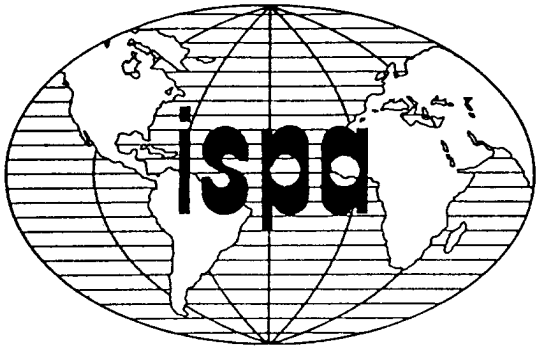
- **Defense Systems Management College (DSMC), Advanced Program Management Course (APMC), CAIV Elective, Thursday, March 25, 1999**

- **Defense Systems Management College (DSMC), Executive Program Management Course (EPMC), Thursday, April 1, 1999**
- **1999 ISPA/SCEA Joint International Conference, San Antonio, TX, June 9, 1999**



Briefings Given [3]

- **TOC/CAIV Workshop 99-2, Navy Acquisition Center of Excellence (ACE), Wednesday, July 28, 1999**
- **Joint ISPA/SCEA Southern California Chapters Workshop, Wednesday, August 25, 1999**



- **TOC/CAIV Workshop 99-3, Navy Acquisition Center of Excellence (ACE), Thursday, November 4, 1999**

Backup

TC Tools - Definitions

- **Design to cost (DTC): A method to ensure that product designs meet a stated cost objective. Cost is addressed on a continuing basis as part of product or process design. The technique embodies early establishment of realistic but difficult cost objectives, goals, and thresholds and then manages the design until it converges on these objectives.**
- **Design for manufacture and assembly (DFMA): A simultaneous engineering process that optimizes the relationship between materials, manufacturing technology, assembly process, functionality, and economics. It seeks to ease manufacture and assembly of parts or eliminate parts.**

TC Tools - Definitions

- **<u>Value engineering</u>: A systematic method of evaluating the functions of a product to determine whether they can be provided at a lower cost without sacrificing the features, performance, reliability, usability, and recyclability of the product. Generally used at the design stage of a product to improve customer value and reduce costs before production has begun.**

Required by OMB Circular No. A-131

- **<u>Quality function deployment (QFD)</u>: A structured matrix approach to documenting and understanding customer requirements and translating them into technical design characteristics for each stage of product development and production.**

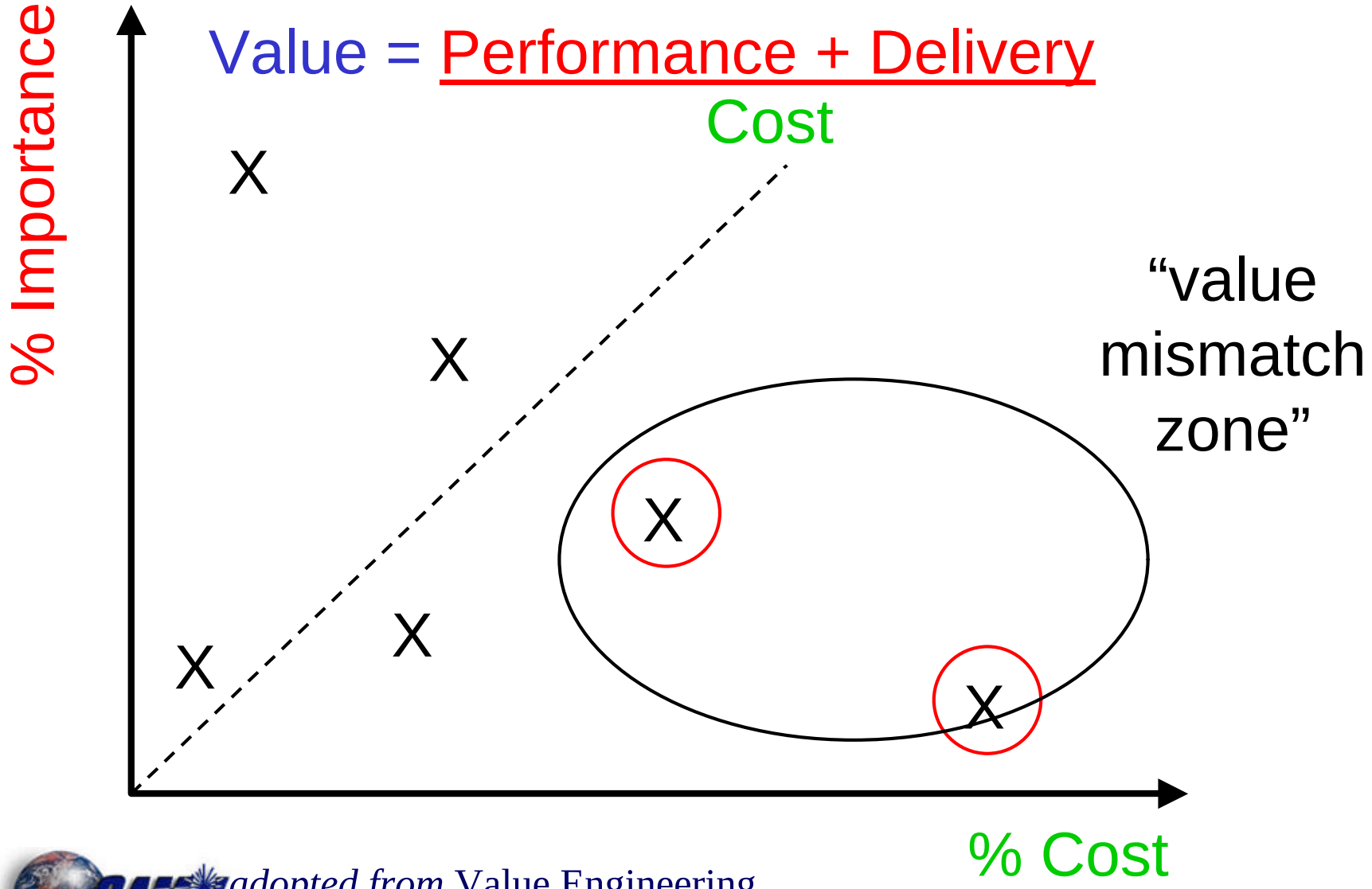
TC Tools - Definitions

- **Total quality management (TQM): An approach that focuses all organizational resources on achieving quality throughout the value chain. Emphasis is on quality from the customer's point of view. Cost should be reduced as product failures and follow-on customer service requirements are reduced.**
- **Benchmarking: The process of investigating and identifying "best practices" and using them as a standard to improve one's own processes and activities.**
- **Continuous improvement program: A program to continuously and incrementally improve yields, eliminate waster, reduce response time, simplify design of both products and processes, and improve quality on a continuous incremental basis.**

Other Tools - Definitions

- **Activity based costing (ABC): A method of costing in which activities are the primary cost objects. ABC measures cost and performance of activities and assigns the costs of those activities to other cost objects, such as products or customers, based on their use of the activities.**
- **Activity based management (ABM): The use of activity cost data to manage activities. The purpose of ABM is to analyze whether activities are of (add) value to customers and how they can be performed to maximize customer value.**
- **Cost tables: Data bases of detailed cost information based on various manufacturing variables. cost tables represent an easily accessible source of information about the effect on product costs of using different productive resources, manufacturing methods, functions, product designs, and materials.**

Value Engineering



adopted from Value Engineering Workshop (L. Shillito, Oct. '99)

OMB Circular No. A-131

- **The Office of Management and Budget (OMB) says:**

  "Federal agencies shall use VE as a management tool, where appropriate, to ensure realistic budgets, identify and remove nonessential capital and operating costs, and improve and maintain optimum quality of program and acquisition functions. Senior management will establish and maintain VE programs, procedures and processes to provide for the aggressive, systematic development and maintenance of the most effective, efficient, and economical and environmentally-sound arrangements for conducting the work of agencies, and to provide a sound basis for identifying and reporting accomplishments."

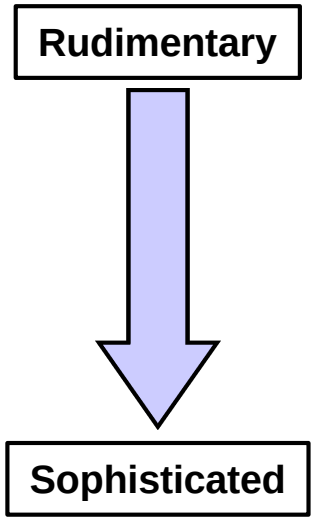
IDE Survey - Background

- **Integrated Digital Environment (IDE) survey, Project Executive Officer for Acquisition Related Business Systems (PEO(ARBS))**
- **Conducted early 1998**
- **Distributed to all Navy and Marine acquisition programs**
- **152 of 450 responded, at least one from each PEO**
- **Draft report, September 23, 1998**
- **DoN IDE website at http://www.peoarbs.navy.mil:81/TopLevel/index.htm**

IDE Survey - Overall Findings

- **Six levels of IDE defined in *Navigating the Digital Environment: A Program Manager's Perspective* (Defense Systems Management College (DSMC)):**
  - **(1) Digital Data Exchanged on physical media**
  - **(2) Electronic Delivery of Digital Data**
  - **(3) CITIS and Common (shared) databases** ← AVG
  - **(4) Local Workflow managers**
  - **(5) Integrated Workflow managers**
  - **(6) Ideal acquisition programs digital environment**

CITIS = **C**ontractor **I**ntegrated **T**echnical **I**nformation **S**ervice



- **Average program level was (3) shared databases**
- **ACAT I programs had highest level of IDE**
  - **higher level of funding**
  - **common programs, tools, and applications across the Program Management Office (PMO)**

IDE Survey - Capabilities

- **Capabilities included:**
  - **E-mail**
  - **Microsoft Office**
  - **Web browsers**
  - **Lotus Notes**
  - **Adobe Acrobat**
  - **Computer-Aided Drawing/Manufacturing (CAD/CAM)**
- **An IDE Architecture or Concept of Operations and daily IDE use were highly cited**
- **Other specific tools included:**
  - **Microsoft Project**
  - **DOORS**

IDE Survey - Functionalities

- **Functionalities included:**
  - **E-mail**
  - **Shared Databases**
  - **Website**
  - **Electronic Calendar**
  - **Workflow**
  - **Video Teleconferencing**
  - **Project Management**
  - **Database Management**
  - **Configuration Management**
  - **Modeling/Simulation**

IDE Survey - Obstacles/Challenges

- **Difficulties cited:**
  - **[Lack of] Funding**
  - **[Lack of] Trained Personnel**
  - **[Lack of] Standards**
  - **Security issues (Restricted access, multi-level security)**
    - Passwords
    - Firewalls
    - Digital Certificates
    - Encryption
  - **Resistance to Change**
  - **Access Problems**
- **External communication issue**
  - **Electronic interface with contractors, other organizations**
- **The "Microsoft Phenomenon"**
  - **standardization vs. diversity**

Briefer's opinion

TOC & CAIV…how do they relate, differ?

- ***CAIV* is a *process* - a <u>way to reduce costs</u>**
- ***TOC* is a *domain* - a <u>set of costs to be reduced</u>**
- ***TOC Reduction* is a *program* - a <u>set of processes</u>**
  - **TOC Reduction seeks to change:**
    - *What we acquire*, usually addressed by CAIV
    - *How we acquire or operate* a system, addressed in a number of ways, in order to reduce cost

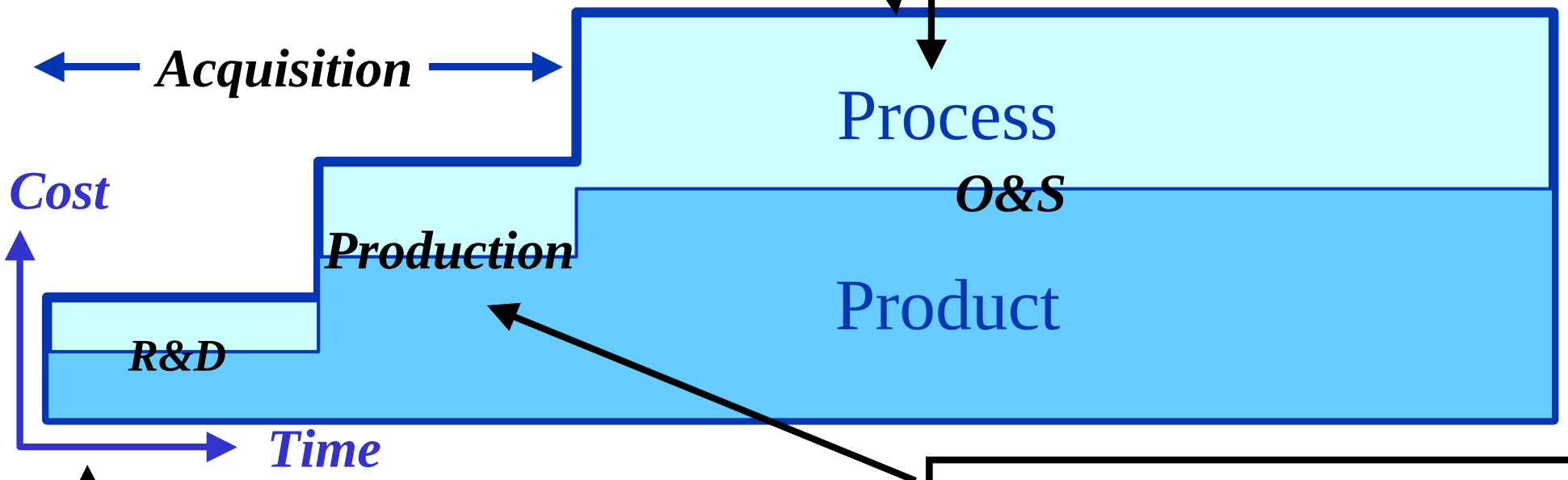
"CAIV is a verb,
TOC is a noun!"

- Bob Jones, NSWC-CD

Product, Process, TOC, CAIV, & Life Cycle

Processes can be improved almost independently of product
These effects are larger if choices are earlier, but costs *can* be affected later

Other TOC Reduction tools apply in the "Process" area



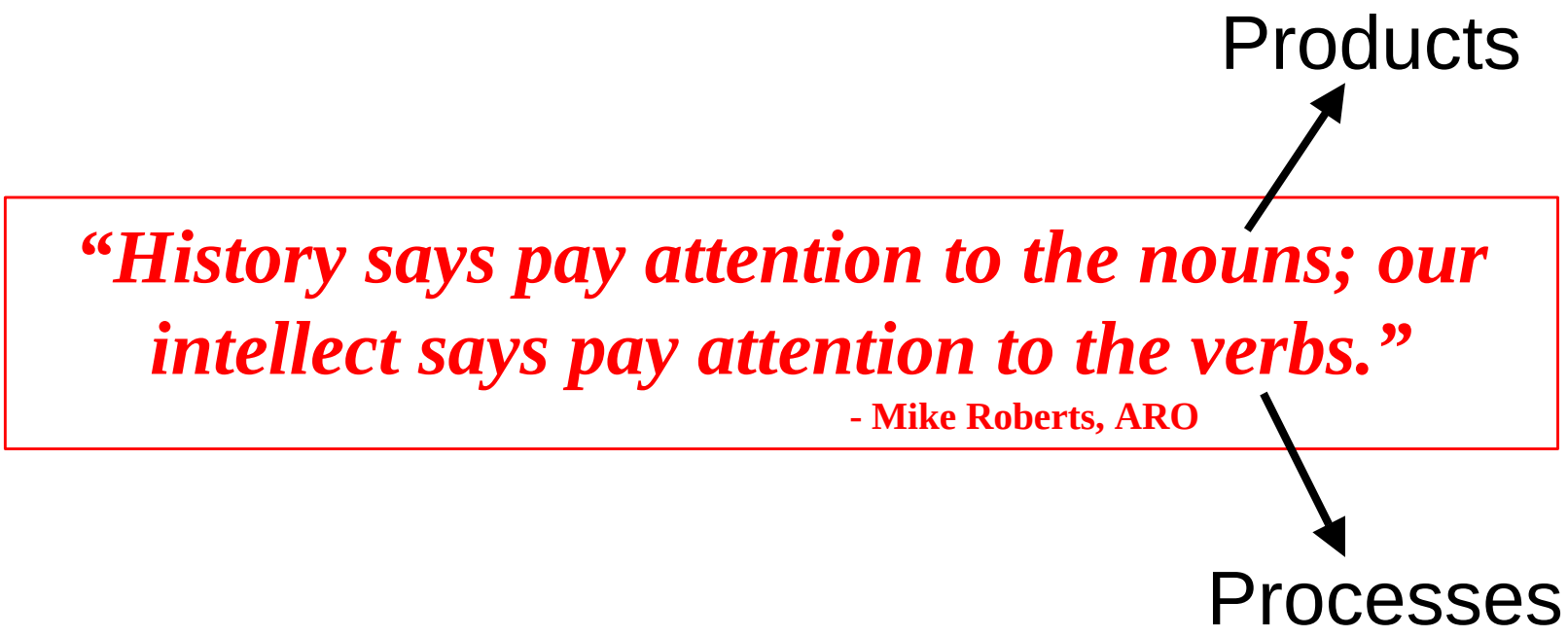
Product choices affect processes and their costs … so product improvements have great leverage … but choices *must* be made early

CAIV is the principal tool in the "Product" area, and is most applicable in Acquisition

Not to scale … it's only a cartoon!

In case you're not confused...

- ***CAIV* can apply to both Product and Process**
  - **It's easiest to think of it as applying to Product**
  - **Organizationally, it's hard to apply to post-Product Process**
- ***TOC Reduction* applies to both Product and Process**
  - **The new emphasis is on reducing Process costs**



Parallel Development of CAIV & TC

- **CAIV was born at the same time that U. S. industry was discovering a Japanese practice called "Target Costing"**
- **OSD promulgated CAIV in fall 1995**
- **The Consortium for Advanced Manufacturing - International (CAM-I) has been instrumental in studying Target Cost and disseminating best practices in the United States**
  - **Target Costing Core and Interest Group began Dec 1993**
  - ***Target Costing: The Next Frontier in Strategic Cost Management* (Shahid L. Ansari, Jan E. Bell) published Sept 1995**

Target Costing
(Ansari, Bell)

CAIV and TC Timelines