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ACQ 405:
Business Case Analysis

Defense Acquisition University

Foundational Learning Workflow Learning Performance Learning

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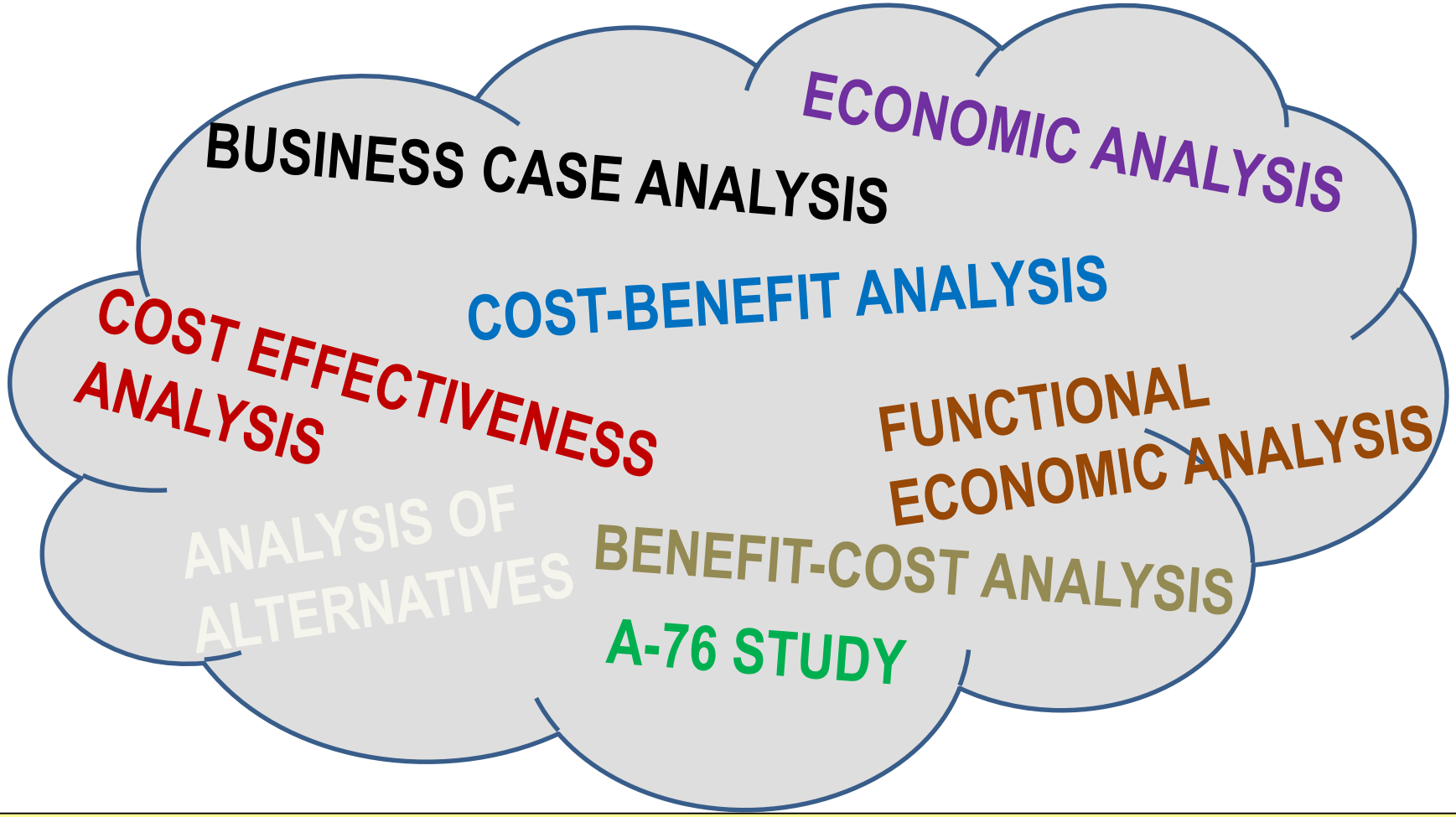
Outline

- Objectives
- Terms
- Key Features of Business Case Analyses
- Acquisition Program Examples
- Personal Examples

Objectives

- How to evaluate and defend program alternatives using BCA, including how to:
  - Identify issues in DoD acquisition programs that require economic analysis
  - Form a team to conduct business case analysis
  - Structure a comprehensive business case analysis
  - Incorporate non-quantitative costs and benefits
  - Avoid practices that could bias or invalidate an analysis

Multitude of Terms
EA/CBA/BCA/FEA/AoA/CEA/A-76

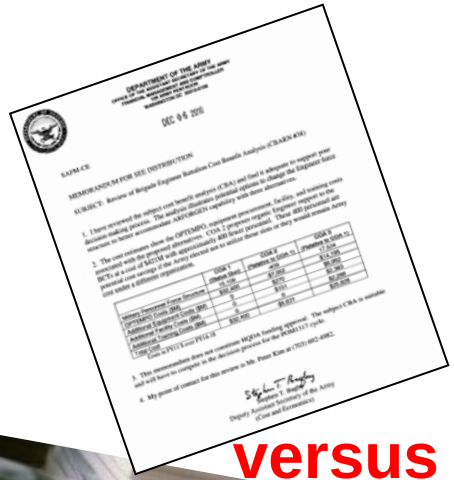


Terms are used inconsistently across DoD and other federal agencies
Seek guidance and examples from your agency

BCA Purpose

A Business Case Analysis provides a framework for making choices between alternatives:

- Identifies requirements, groundrules and assumptions
- Systematically identifies and compares quantifiable and non-quantifiable costs and benefits of alternatives
- Includes recommendation of preferred alternative



versus

A structured framework for determining costs and benefits of competing alternatives and recommending a preferred alternative

10 USC 2366b Requirements at Milestone B

~~Certification~~ **CERTIFICATIONS AND DETERMINATION REQUIRED**.—A major defense acquisition program may not receive Milestone B approval until the milestone decision authority—

(1) has received a preliminary design review and conducted a formal post-preliminary design review assessment, and certifies on the basis of such assessment that the program demonstrates a high likelihood of accomplishing its intended mission;

(2) further certifies that the technology in the program has been demonstrated in a relevant environment, as determined by the milestone decision authority on the basis of an independent review and assessment by the Assistant Secretary of Defense for Research and Engineering, in consultation with the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation;

(3) ~~Has received a business case analysis and certifies on the basis of that analysis that~~ **determines in writing that—**

(A) the program is affordable when considering the ability of the Department of Defense to accomplish the program's mission using alternative systems;

(B) appropriate trade-offs among cost, schedule, **technical feasibility**, and performance objectives have been made to ensure that the program is affordable when considering the per unit cost and the total acquisition cost in the context of the total resources available during the period covered by the future-years defense program submitted during the fiscal year in which the certification is made;

Changes made by NDAA 2016

Example documents for 2366b BCA

1. ARA memo
2. AoA
3. ORD
4. CDD
5. ASR
6. SCP
7. ICE
8. PB
9. TRA report and memo
10. PDR report
11. CDD JROCM
12. Class Justification & Approval
13. Service Full Funding Memos
14. MNS

Business Case for Defense Business Systems

INFORMATION REQUIRED	WHEN REQUIRED	BELOW MAIS	MAIS	MDAP
Business Case	MS A Updated for: • MS B • MS C • FDD • ATP	This policy	This policy	This policy
Summaries of this information shall be included in the Business Case:[1]				
1. AoA (MS A)		S	S	S
2. Cost Estimate[2] (Mandatory for MAIS; as required by CAE for MDAP) (MS A and MS B)		R	R	R
3. Economic Analysis (EA) (MS A and MS B) In accordance with DoDI 7041.3		N/A	S	S
4. Market Research (MS A)		S	S	S
5. Acquisition Approach		N/A	R	S
a. Data Management Strategy (MS A, MS B, MS C, and FDD)		S	S	S
b. Information Support Plan (ISP) (MS B and MS C)		R	R	R
c. Consideration of Technology Issues (MS A)		S	S	S
d. Lifecycle Sustainment Plan (MS A, MS B, MS C, and FDD)		R	R	R
e. Systems Engineering Plan (MS A, MS B, MS C)		N/A	R	S
f. Technology Development Strategy, Including Net-Centric Data Strategy (MS A)		N/A	R	S
g. A test plan shall be approved by the DOT&E and DDT&E and included in the Business Case (MS A, MS B, MS C, and FDD); OSD OT&E oversight programs only.		R	S	S

Directive Type Memo 11-009 Acquisition Policy for Defense Business Systems:
https://dap.dau.mil/policy/Documents/2011/DTM%2011-009.pdf

Procedures for Economic Analysis

DoDI 7041.3: Economic Analysis for Decisionmaking

- Objective
  - Clearly define and quantify the function to be accomplished
- Assumptions
  - Base analysis on facts and data. Make assumptions only when necessary to account for uncertainties.
- Alternatives
  - Identify feasible ways of satisfying the objective
- Costs and Benefits
  - Identify quantifiable and qualitative costs and benefits associated w/each alternative
- Compare Alternatives
  - Compare costs and benefits of each alternative and rank by net present value
- Sensitivity and Uncertainty Analyses
  - Account for uncertainties in the analysis by testing the sensitivity of the analysis results to various factors
- Results and Recommendations
  - Interpret results and include a recommendation of the preferred alternative

Financial vs. Non-Financial Cost/Benefits

- Financial (Quantitative)
  - Quantifiable – measurable in financial terms
  - Based on supportable rationale
  - Tangible – i.e., the benefit can be documented
- Non-Financial (Qualitative)
  - Unable to quantify in financial terms
  - May be Intangible, e.g.,
    - Improved Capabilities
    - Improved Morale
    - Industrial Base Considerations
    - Political

Acquisition Program Examples

- Analysis of Alternatives
- Life Cycle Product Support
- 2366B (MS B) Certification for MDAPs
- Competitive Prototyping
- Sole Source or Competition
- Upgrade vs. Recap vs. Buy New
- Lead System Integrator vs. GFE
- Active Duty vs. Reserve/Guard
- Program Initiation at EMD vs. Production

Personal Examples

- Live in the city or a rural area
- Retire or keep working
- Choosing a university
- Renovating vs. buying a new home
- Public vs. private school
- Choosing between job offers
- Elope vs. big wedding
- Illness—treat or not?
- Boat vs. new car

Questions I might ask

- What are the real, no-kidding requirements?
- Are the assumptions valid? Necessary?
- Are cost reduction claims real?
- Can qualitative benefits be quantified? If yes, have they been quantified correctly?
- Has risk/uncertainty been properly considered?
- How sensitive are the results? Do you need to do an excursion based on a changed assumption?

What others might criticize

Let me count the ways…

- Assumptions are wrong or incomplete
- Requirements are wrong or incomplete
- Quantitative methods are wrong
- Qualitative criteria are improperly weighted
- Recommendation is “politically infeasible”
- Results or Recommendations need to be updated

Sound analysis is essential; confidence and good communication abilities are also critical when defending a recommendation

It would be nice not to…

- Do a BCA after the decision is made
- Construct a BCA's criteria such that the decisionmaker's "judgment" alone is determinant
- Do another BCA when results of the first are unpalatable
- Ask the BCA to "solve world hunger"

(U) Study Team Organization

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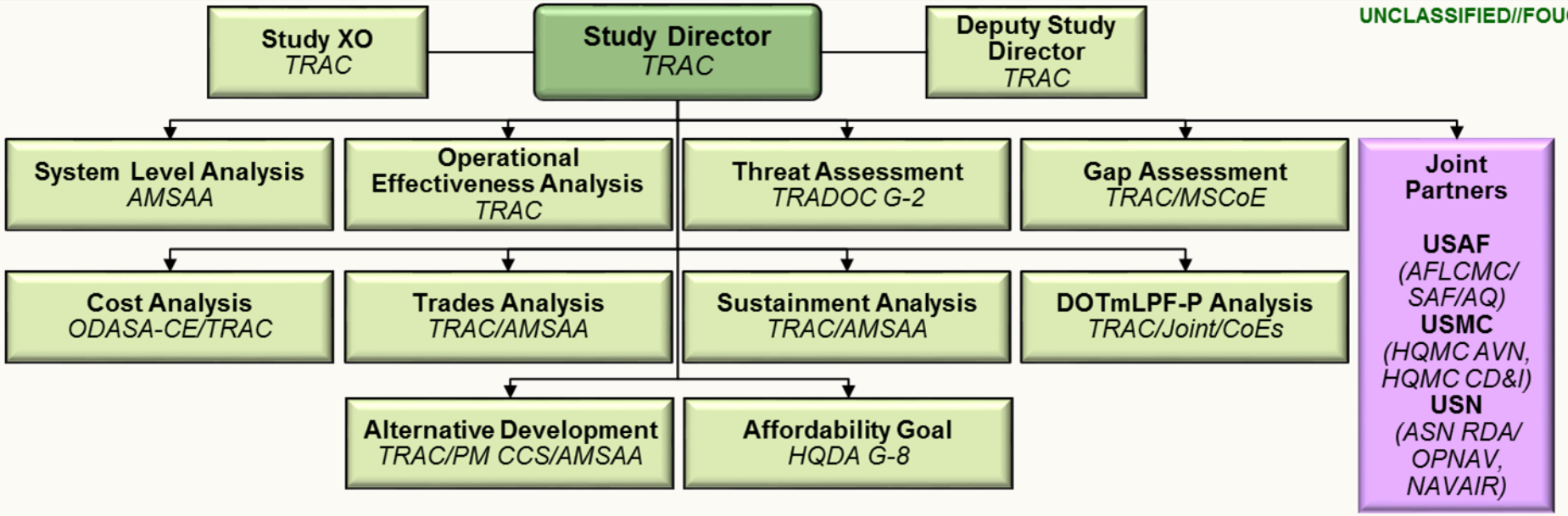

Key Support

- I Corps
- III Corps
- XVIII Corps (ABN)
- ARCIC
- ARDEC
- ARL
- ASA(ALT)
- ATEC
- DTRA
- DUSA-TE
- HQDA CIO/G-6
- HQDA G-3/5/7
- HQDA General Counsel
- HQDA OCE
- NGIC
- OSD (AT&L/CAPE/DOT&E)
- PEO AMMO
- PEO C3T
- USDP
- USFK
- USMA

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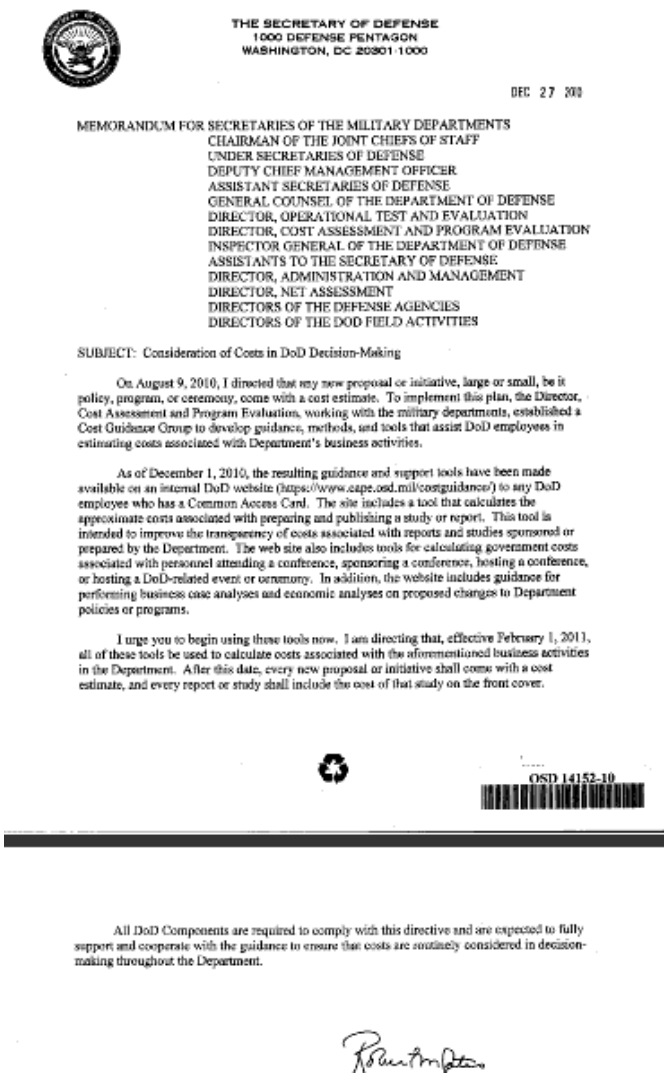
(U) AMSAA – Army Materiel Systems Analysis Activity
(U) ARDEC – Armament Research, Development, and Engineering Center
(U) ARL – Army Research Laboratory
(U) ASA(ALT) – Assistant Secretary of the Army for Acquisition, Logistics, and Technology
(U) ATEC – Army Test and Evaluation Command
(U) DTRA – Defense Threat Reduction Agency
(U) DUSA-TE –Department of the Undersecretary of the Army, Test and Evaluation
(U) HQDA CIO/G-6 – Headquarters, Department of the Army, Chief Information Officer
(U) HQDA G-3/5/7 – Headquarters, Department of the Army, Operations and Plans
(U) HQDA G-8 – Headquarters, Department of the Army, Office of the Deputy Chief of Staff for Programs
(U) HQDA General Counsel – Headquarters, Department of the Army General Counsel
(U) HQDA OCE – Headquarters, Department of the Army, Office of the Chief of Engineers
(U) MSCoE – Maneuver Support Center of Excellence
(U) NGIC – National Ground Intelligence Center
(U) ODASA-CE – Office of the Deputy Assistant Secretary of the Army for Cost and Economics
(U) OSD AT&L – Office of the Secretary of Defense for Acquisition, Technology, and Logistics
(U) OSD DOT&E – Office of the Secretary of Defense, Director Operational Test and Evaluation
(U) PEO AMMO – Program Executive Office, Ammunition
(U) PEO C3T – Program Executive Office, Command, Control, Communications-Tactical
(U) PM CCS – Program Manager, Close Combat Systems.
(U) TRADOC G-2 – Training and Doctrine Command, Intelligence Support Agency
(U) USAF, AFLCMC – United States Air Force, Air Force Life Cycle Management Center
(U) USAF SAF/AQ – United States Air Force, Secretary of the Air Force (Acquisitions).
(U) USDP – Under Secretary of Defense, Policy
(U//FOUO) USFK – United States Forces Korea
(U) USMA – United States Military Academy
(U) USMC HQMC AVN– United States Marine Corps, Headquarters Marine, Aviation
(U) USMC HQMC CD&I – United States Marine Corps, Headquarters Marine, Corps Combat Development and Integration
(U) USN (ASN RDA) – United States Navy, Assistant Secretary of the Navy, Research, Development, and Acquisition
(U) USN (NAVAIR) – United States Navy, Naval Air Systems Command
(U) USN (OPNAV) – United States Navy, Office of the Chief of Naval Operations

References

1. OMB Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs: http://www.whitehouse.gov/omb/circulars_a094/
2. DoD Instruction 7041.3, "Economic Analysis for Decisionmaking: http://www.dtic.mil/whs/directives/corres/pdf/704103p.pdf
3. DoD Product Support BCA Guidebook: http://www.acq.osd.mil/log/mr/library/BCA_Guidebook_April2011.pdf
4. DA Economic Analysis Manual: https://www.cape.osd.mil/CostGuidance/Docs/ArmyCEAC_econ_analysisManual.pdf
5. DA Cost Analysis Manual: https://www.cape.osd.mil/CostGuidance/Docs/cam.pdf
6. US Army Cost-Benefit Analysis Guide: https://www.cape.osd.mil/CostGuidance/Docs/US%20Army%20CBA%20Guide%20V1%2020100112.pdf
7. US Army Cost-Benefit Analysis Portal (must request access): https://cpp.army.mil/portal/page/portal/Cost_Performance_Portal/CPP_Main_Page/CBA_Portal/
8. DON Enterprise IT BCA Template: http://www.doncio.navy.mil/ContentView.aspx?ID=2210
   DON Enterprise IT Abbreviated BCA Template: http://www.doncio.navy.mil/ContentView.aspx?id=4056
9. DON PBL BCA Guidebook: https://acc.dau.mil/adl/en-US/46528/file/13829/DON%20PBL%20BCA%20GUIDE%201NOV05.doc
10. AFI 65-501 (Economic Analysis): https://www.cape.osd.mil/CostGuidance/Docs/AFI65-501.pdf
11. AFI 65-509 (Business Case Analysis): https://www.cape.osd.mil/CostGuidance/Docs/AFI65-509.pdf
12. AFM 65-506 (Economic Analysis): https://www.cape.osd.mil/CostGuidance/Docs/AFMAN65-506.pdf
13. AFM 65-510 (BCA Procedures): https://www.cape.osd.mil/CostGuidance/Docs/AFMAN65-510.pdf
14. DAU CLL 040 BCA Tools: http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=1948
15. DAU CLL 015 Product Support BCA: http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=244
16. DAU CLR 151 Analysis of Alternatives: http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=1889
17. USAF Office of Aerospace Studies AoA Handbook: http://www.prim.osd.mil/Documents/AoA_Handbook.pdf

Backup

DoD Guidance



THE SECRETARY OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

DEC 27 2010

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DEPUTY CHIEF MANAGEMENT OFFICER
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
DIRECTOR, COST ASSESSMENT AND PROGRAM EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Consideration of Costs in DoD Decision-Making

On August 9, 2010, I directed that any new proposal or initiative, large or small, be it policy, program, or ceremony, come with a cost estimate. To implement this plan, the Director, Cost Assessment and Program Evaluation, working with the military departments, established a Cost Guidance Group to develop guidance, methods, and tools that assist DoD employees in estimating costs associated with Department's business activities.

As of December 1, 2010, the resulting guidance and support tools have been made available on an internal DoD website (https://www.cape.osd.mil/costguidance/) to any DoD employee who has a Common Access Card. The site includes a tool that calculates the approximate costs associated with preparing and publishing a study or report. This tool is intended to improve the transparency of costs associated with reports and studies sponsored or prepared by the Department. The web site also includes tools for calculating government costs associated with personnel attending a conference, sponsoring a conference, hosting a conference, or hosting a DoD-related event or ceremony. In addition, the website includes guidance for performing business case analyses and economic analyses on proposed changes to Department policies or programs.

I urge you to begin using these tools now. I am directing that, effective February 1, 2011, all of these tools be used to calculate costs associated with the aforementioned business activities in the Department. After this date, every new proposal or initiative shall come with a cost estimate, and every report or study shall include the cost of that study on the front cover.

OSD 14152-10

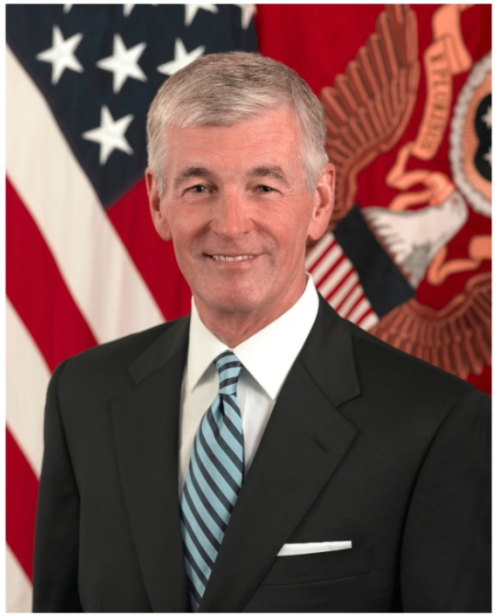
All DoD Components are required to comply with this directive and are expected to fully support and cooperate with the guidance to ensure that costs are routinely considered in decision-making throughout the Department.

"I am directing that any new proposal or initiative, large or small, be it policy, program, or ceremony, come with a cost estimate. That price tag will help us determine whether what we are gaining or hope to gain is really worth the cost, either in dollar terms or in the diversion of limited manpower and resources from other missions."

former Secretary of Defense Robert Gates, Aug 9, 2010

https://www.cape.osd.mil/CostGuidance/docs/Consideration%20of%20Costs%20in%20DoD%20Decision%20Making,%20OSD%2014152-10.pdf

Service Guidance
Secretary of the Army



"All issues, proposals or requirements must address the costs and trade-offs against projected benefits. The CBA is the Army's primary tool to enable resource-informed decisions. The net result of the CBA should be a strong "value proposition" -a clear statement that the benefits more than justify the costs and required trade-offs."

Secretary of the Army John M. McHugh, Mar 14, 2011

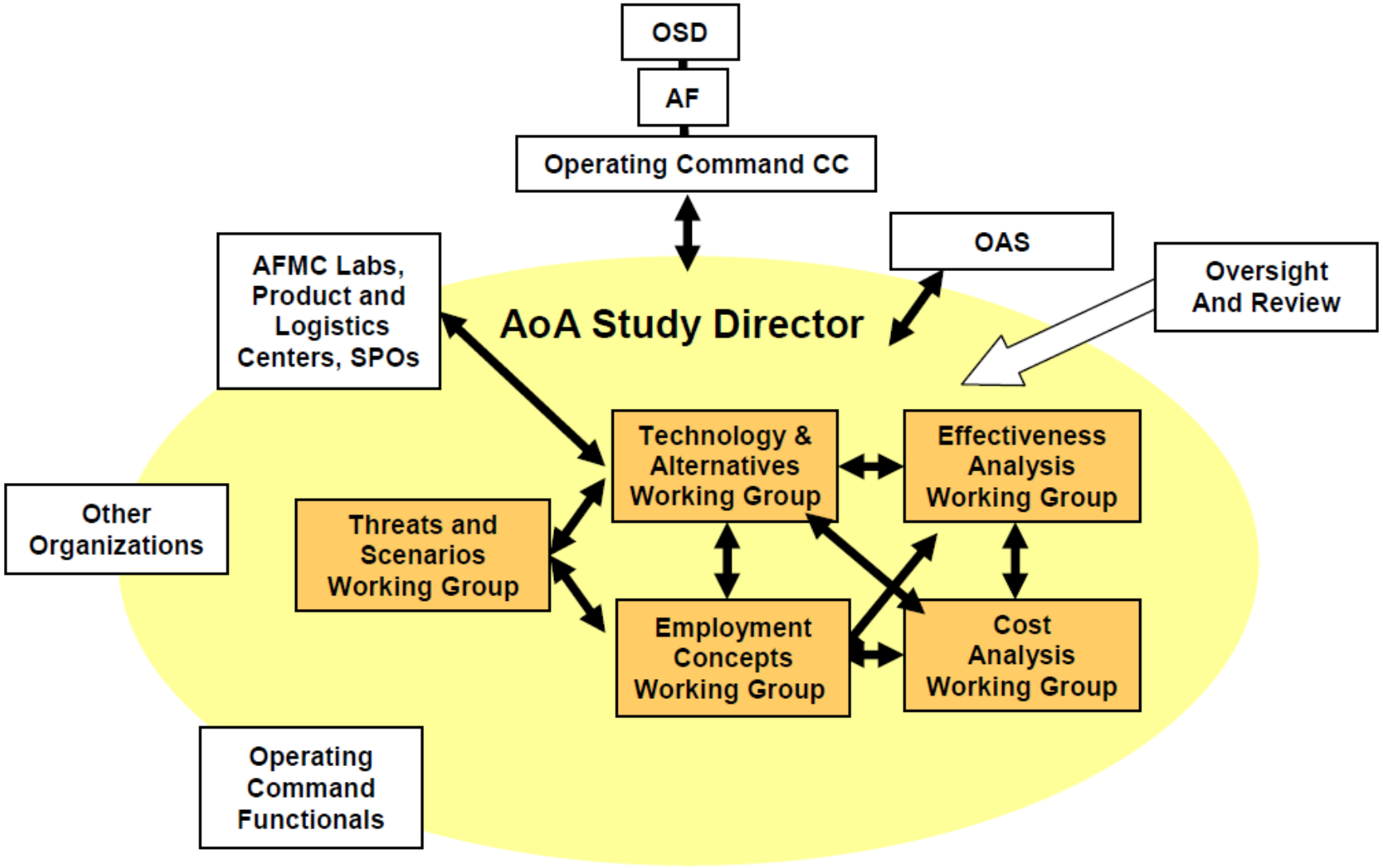
Characteristics of Analysis

Analysis, Structure, Process, and Questions

Analysis is an analytical study of problems undertaken to provide the responsible commanders and staff agencies with a scientific basis for decisions or action to improve operations.

Analysis (operational research)		
Structure	**Process**	**Questions**
• **Structured Study** ○ Employs operations research ○ Solves a problem ○ Answers staff study issues/questions ○ Examines a wide range of alternatives ○ Converts real life into math models or simulations ○ Identifies results and meaning from data and information ○ Decision-maker selects best course of action	• Define the system or problem to analyze • Understand/define general methodology • Identify assumptions and constraints • Identify tools • Analyze results of analysis, make changes as needed • Perform sensitivity analysis as you go • Perform sanity checks on results and conclusions • Presentation	• **Feasibility analysis** ○ Will it work? Can I make it work better? • **Suitability analysis** ○ It works, but is it suitable for the task? • **Comparative analysis** ○ How does it stack up against the competition? • **Sensitivity analysis** ○ How applicable is my answer to its actual use? ○ What happens if changes are made?

AoA Study Team Structure (example)



Sensitivity/Uncertainty Analysis

- Sensitivity analysis
  - Identify primary cost drivers
  - 80/20 Rule: 80% of variance caused by 20% of the inputs
  - Limit appetite to most likely scenarios (costing many scenarios is difficult for staff, complex for decisionmakers)
  - Keep it explainable
- Group uncertainty into two categories
  - Controllable
  - Outside program's control

Sensitivity Analysis for a BCA differs from that for a cost estimate in that only factors that potentially *change* the recommendation need be evaluated.

Net Present Value/Discount Rate

- OMB Discount Rate Policy
  - "to compute net present value, it is necessary to discount future benefits and costs. This discounting reflects the time value of money. Benefits and costs are worth more if they are experienced sooner."
  - "All future benefits and costs, including nonmonetized benefits and costs, should be discounted. The higher the discount rate, the lower is the present value of future cash flows."
- Net Present Value (NPV)
  - Represents total cash flow (monetary costs and benefits) across the analysis period, adjusted to reflect the time value of money
  - Other things being equal, the action or investment with the larger NPV is the better option

OMB Circular A-94: ***"The standard criterion for deciding whether a government program can be justified on economic principles is net present value -- the discounted monetized value of expected net benefits (i.e., benefits minus costs)."***

*OMB Circular A-94: http://www.whitehouse.gov/omb/circulars_a094/

Sample of Quantifiable Benefits

- Cost savings or avoidance
- Lower cost for future projects through shared infrastructure and knowledge
- Reduced need for future capacity expansion
- Improved security and fewer breaches
- Reduced demand for service
- Reduced processing through common standards and processes
- Reduced error rates, re-work, complaints
- Reduced need for multiple data collection
- Reduced time required
- More accurate, up-to-date, or cleaner
- Additional capacity
- Increased productivity
- Decreased manual functions
- Reduced redundancy

ETC…

US Army Cost-Benefit Analysis Guide:
https://www.cape.osd.mil/CostGuidance/Docs/US%20Army%20CBA%20Guide%20V1%2020100112.pdf

Sample non-Quantifiable Benefits

- Better information to facilitate policy making
- More, greater or new data collection
- Improved management
- Better policy alignment and outcomes
- Additional tools and functions
- Better customer service, service integration
- Better service consistency and quality
- Improved user satisfaction, involvement, and participation
- Better Communication, More Flexibility
- Improved reputation, increased user trust and confidence
- More integrated view of customers, contribution and transparency
- More reliable or up-to-date
- Greater use, faster or easier access
- Better transparency or empowerment

ETC…

US Army Cost-Benefit Analysis Guide:
https://www.cape.osd.mil/CostGuidance/Docs/US%20Army%20CBA%20Guide%20V1%2020100112.pdf