DSMC PROGRAM MANAGERS TOOL KIT

PREFACE

This 9th Edition of the "Tool Kit" contains a graphic summary of acquisition policies and managerial skills frequently required by DoD program managers. It is an updated version of a "Tool Box" that was first developed by Mr. Charles F. Schied of PMC 92-1. For convenience, it is sized for insertion into a 3-hole, 5-1/2" x 8-1/2" "Day Runner." The information was extracted from material presented by the Defense Systems Management College (DSMC) in the Intermediate Systems Acquisition Course (ISAC) and Advanced Program Management Course (APMC). It reflects Change 3 to DoD 5000.2-R. Material from the DSMC Learning Resource Center was also used.

Users of the "Tool Kit" are reminded that this summary is a guide only and should not be used as a substitute for official policy guidance. Periodic review of official policy guidance is recommended.
DSMC PROGRAM MANAGERS TOOL KIT

ACKNOWLEDGMENTS

As Sponsor of this "Tool Kit" Project, I wish to recognize the following members of the DSMC faculty and staff for their input to this 9th Edition: Mr. Bill Bahnmaier, who coordinated the input and editing of material from various departments; Ms. Johnnie Kennedy of the Principles of Program Management Department for typing, formatting and editing support; Mr. Chuck Cochrane of the Acquisition Policy Department for his significant input and editing support; Mr. Eduard Boyd of the Visual Arts Department for his support in preparing and editing drafts for printing; Mr. Frank Scavotto and Mr. Mike King, of the Defense Automated Printing Service (DAPS) for their excellent printing support. Other significant contributors were Commander John Kelley, PML Department; Mr. Frank Meneely, CM Department; Mr. Paul Alfieri, TE Department; Dr. John Snoderly and Mr. Randy Zittel, SE Department; Dr. Ben Rush, CF Department; Mr. Walt Weedman, formerly of the EV Department; Mr. John Riffée, LS Department; Mr. Gerry Land and Ms. Siobhan Tack, FM Department; Lt Col Dave Schmitz, MM Department; and Mr. Richard Kwatroski of the Executive and International Course Department. I also want to thank Mr. Richard Reed, Provost, who provided both encouragement and command support for the project.

John T. Shannon
Dean Faculty Division
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ACQUISITION MANAGEMENT

- Things that make you go "Hmmm?..."
  
  "The only thing most auditors fix is the blame."
  
  "Experience is something you got just after you needed it."
  
  "People are smarter than they look; listen to them."
  
  "The last 10 percent of the performance sought generates one-third of the cost and two-thirds of the problems."
  
  "Never open a can of worms unless you want to go fishing."
  
  "Those who believe it cannot be done will please get out of the way of those who are busy doing it."

- Things we should always remember.
  
  "Be honest in everything you say, write and do."
  
  "Be good to your people, and they will be good to you."
  
  "Forgiveness is easier to obtain than permission."
  
  "Keep everyone informed; when in doubt, coordinate."
  
  "Be the first to deliver bad news."
  
  "If you are sitting at your desk, you are not managing your program."
THE PROGRAM MANAGER’S BILL OF RIGHTS AND RESPONSIBILITIES

RIGHTS:

Program Managers have the RIGHT to:
- A single, clear line of authority from the Defense Acquisition Executive.
- Authority commensurate with their responsibilities.
- Timely decisions by senior leadership.
- Be candid and forthcoming without fear of personal consequences.
- Speak for their program and have their judgments respected.
- The best available training and experience for the job.
- Adequate financial and personnel resources.

RESPONSIBILITIES:

Program Managers have the RESPONSIBILITY to:
- Accept program direction from acquisition executives and implement it expeditiously and conscientiously.
- Manage their programs to the best of their abilities within approved resources.
- Be customer focused and provide the user with the best, most cost-effective systems or capabilities.
- Innovate, strive for optimal solutions, seek better ways to manage, and provide lessons-learned to those who follow.
- Be candid about program status, including risks and problems as well as potential solutions and likely outcomes.
- Prepare thorough estimates of financial and personnel resources that will be required to manage the program.
- Identify weaknesses in the acquisition process and propose solutions.
# Defense Acquisition Milestones & Phases

<table>
<thead>
<tr>
<th>DETERMINATION OF MISSION NEED</th>
<th>PHASE 0</th>
<th>PHASE I</th>
<th>PHASE II</th>
<th>PHASE III</th>
<th>DEMILITARIZATION &amp; DISPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission need requires materiel solution. Mission Need Statement (MNS) prepared.</td>
<td>Concept Exploration</td>
<td>Program Definition &amp; Risk Reduction</td>
<td>Engineering &amp; Manufacturing Development</td>
<td>Production, Fielding, Deployment, &amp; Operational Support</td>
<td>Control materiel for demilitarization/ensure disposal complies with environmental requirements</td>
</tr>
</tbody>
</table>

**PHASE 0**
- MS 0: Approval to Conduct Concept Studies
  - Approval of:
    - Short-term concept studies
    - Phase 0 exit criteria

**PHASE I**
- MS 1: Approval to Begin a New Acquisition Program
  - Approval of:
    - Acquisition Strategy
    - Cost as an Independent Variable (CAIV) objectives
    - Initial Acquisition Program Baseline (APB)
    - Phase I exit criteria
    - TEMP (by DOT&E & DTSE&E)*

**PHASE II**
- MS II: Approval to Enter Engineering & Manufacturing Development
  - Approval of:
    - Acquisition Strategy
    - CAIV objectives
    - Updated APB
    - LRIP quantities
    - Live Fire T&E waiver (if applicable)
    - Phase II exit criteria
    - TEMP (by DOT&E & DTSE&E)*

**PHASE III**
- MS III: Production or Fielding/Deployment Approval
  - Approval of:
    - Acquisition Strategy
    - Production (weapon systems), or deployment (information systems)
    - Updated APB
    - Phase III exit criteria (if applicable)

*OSD T&E Oversight Programs only
DSMC PROGRAM MANAGERS TOOL KIT

ACQUISITION CATEGORIES (ACAT)

ACAT 1D:
- DAB Review
- Designated by DAE
- Decision by DAE

Major Defense
Acq Pgrms

ACAT IC:
- Component Review
- Designated by DAE
- Decision by Svc Secr/CAE

ACAT IAM:
- MAISRC Review
- Designated by ASD(C3I)
- Decision by ASD(C3I)

Major AIS
Acq Pgrms

ACAT IAC:
- Component Review
- Designated by ASD(C3I)
- Decision made by Comp. Chief Information Officer

Major
Systems

ACAT II:*
- Does Not Meet ACAT I Criteria
- Designated by Svc Secr/CAE
- Decision by Svc Secr/CAE

all others
(except for Army
Navy, USMC)

ACAT III:
- Does Not Meet ACAT I, IA or II Criteria
- Designated IAW Component policy
- Decision at lowest appropriate Level

Army
Navy
USMC

ACAT IV:
- Not otherwise designated ACAT I, IA, II or III
- Designated IAW Component Policy
- Navy/USMC ACAT I/II
- Decision at lowest appropriate level

*Army has an ACAT IIA category for AIS reviewed at Army CIO level

$355M RDT&E or $2.135B Procurement (FY96 Constant $)

$360M Life Cycle Cost or $120M Total Prog. Cost or $30M Prog. Cost in any single year (FY96 Constant $)

$140M RDT&E or $645M Procurement (FY96 Constant $)

No Fiscal Criteria

See AR 70-1 (Army) & SECNAVINST 5000.2B (Navy and Marine Corps)
ACQUISITION STRATEGY ELEMENTS
(ACAT I & IA PROGRAMS)
(See Part 3.3, DoD 5000.2-R)

• Open Systems Objectives
• Sources
  Commercial & NDI
  Dual Use Technologies & Use of Commercial Plants
  Critical Product & Technology Competition
  Industrial Capability
  Leasing (10 USC 2401a)
• Cost, Schedule, and Performance Risk Management
• Cost As an Independent Variable
  Cost Performance Trade-offs
  Cost Management Incentives
• Contract Approach
  Competition
  CALS Integrated Data Environment
  Best Practices
  Advance Procurement *
  Integrated Baseline Reviews
• Management Approach
  Streamlining
  Information Sharing & Oversight
  International Cooperation (10 USC 2350) *
  Assignment of PEO
  Use of DCMC Tech. Support
  Joint Program Management
• Environmental, Safety, & Health Evaluation (42 USC 4321-47)
• Modeling & Simulation Approach **
• Source of Support
• Warranties *
• Government Property in the Possession of Contractors **

* normally not applicable to AIS programs
** new elements in proposed change 4 to DoD 5000.2-R
ACQUISITION REFORM INITIATIVES

- Integrated Product and Process Development and Integrated Product Teams
- Movement from Detailed Design Specifications and Process Standards to Performance and/or Commercial Specifications
- Single Process Initiative
- DoD Cost/Schedule Control System Criteria Replaced by Industry Standard Guidelines for Earned Value Management System (EVMS)
- Commercial and Non-Developmental Item Acquisition and Practices
- Cost As an Independent Variable (CAIV)
- Open Systems Design and Interoperability
- Rewrite of DoDD 5000.1 and DoD 5000.2-R to streamline policies and procedures
- Defense Acquisition Deskbook
- Defense Acquisition Pilot Programs
- Implementation of Federal Acquisition Streamlining Act (FASA), Federal Acquisition Reform Act (FARA) and Information Technology Management Reform Act (ITMRA); (latter two are now known as Clinger-Cohen Act)
- Electronic Commerce/Electronic Data Interchange
- Collection and Use of Past Performance Information
- Advanced Concept Technology Demonstrations (ACTD)
- Acquisition Reform Benchmarking Initiative
- Acquisition Workforce Personnel Demonstration Program
- Contract Administration Reform
- Procurement Process Reform
- Performance Based Service Contracting
- Defense Reinvention Impact Center (RIC) -- Goals by Year 2000
- Total Ownership Costs (TOC)
PLANNING TO SUPPORT ACQUISITION PROCESS

- Planning to support the acquisition process is accomplished within the Integrated Product and Process Development (IPPD) environment.
- Program plans are for use by the PM and the integrated product teams (IPTs) that support the PM and are discretionary.
- There are three exceptions where specific plans are required: Acquisition Plan required by the FAR/DFARS; Command, Control Communications, Computers and Intelligence, (C4I) Support Plan and TEMP -- the latter two are required by DoD 5000.2-R.
- Typically, the following areas will require some level of program office planning:
  - Acquisition Strategy (page 5)
  - Systems Engineering
  - Logistics Support/Post Prod Spt
  - Program Protection
  - Training Development
  - Technology Assessment & Control
  - Risk Management
  - Computer/Software Devel/PDSS
  - Human Systems Integration
  - Deployment/Fielding
  - Manufacturing
  - Integrated Testing

The Defense Acquisition Deskbook
DSMC PROGRAM MANAGERS TOOL KIT

DAB Timeline (Milestones I-III)

Overarching Integrated Product Team (OIPT) Meetings

Acq Strategy approval/ RFP release
CARD to CAIG
Draft LCCE to CAIG
JROC Review
Final LCCE to CAIG
DAB

1 WEEK 1 HRS
46 HRS
12 WEEKS
8 WEEKS
2 WEEKS
10 DAYS
21 DAYS
30 DAYS
45 DAYS
180 DAYS

CARC - Cost Analysis Requirements Description
LCCE - Life Cycle Cost Estimate(s)
CAIG - Cost Analysis Improvements Group
JRB - JROC Review Board
JROC - Joint Requirements Oversight Council
DRM - DAB Readiness Meeting
DAB - Defense Acquisition Board
ADM - Acquisition Decision Memorandum

Milestone Decision Information — A Possible Construct

1 WHY?
  • Threat
  • Capability

2 WHAT?
  • Requirement
  • Analysis of Alternatives

3 HOW?
  • Acquisition Strategy

4 RISKS?
  • Risk Mgmt Plan
  • T&E Plan
  • T&E Results

5 COST?
  • CAN Objectives
  • LCCE
  • ICE

6 MANAGEMENT?
  • PMO Structure
  • IPT Structure
  • WiPT - OIPT Structure

7 AGREEMENT?
  • APB
  • ADM
  • Exit Criteria

• Have I Presented All Necessary Information?
• Does the Info Flow Logically?
• Is the Info Clear and Accurate?
• Is it Concise, Executive-Level?
### Information for Milestone Reviews
#### ACAT I and ACAT IA Programs

<table>
<thead>
<tr>
<th>Information</th>
<th>Milestone</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td><strong>NOTE:</strong> MDA may waive non-statutory requirements</td>
<td>0 I II III DoD 5000.2-R Other</td>
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<tr>
<td>Acquisition Program Baseline (APB) ¹</td>
<td>X X X</td>
<td>Part 3.2.2 10 USC 2435</td>
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<tr>
<td>Acquisition Strategy (11 elements - see page 5)</td>
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<td>Part 3.3</td>
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<tr>
<td>Analysis of Alternatives (AOA) ²</td>
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<td>Acquisition Decision Memorandum (ADM)</td>
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<td>Part 5.2.1</td>
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<tr>
<td>Affordability Assessment</td>
<td>X X X</td>
<td>Part 2.5.2 DoD 5000.1</td>
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<tr>
<td>Beyond Low Rate Initial Production (LRIP) Report ³</td>
<td>X</td>
<td>Part 6.3.3 10 USC 2399</td>
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<tr>
<td>Component Cost Analysis (CCA)</td>
<td>X X X</td>
<td>Part 5.8 DoD 5000.4</td>
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<td>Consideration of Technological Issues</td>
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<td>Cost Analysis Requirements Description (CARD)</td>
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<td>Exit Criteria</td>
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<td>Part 3.5.1 10 USC 2434</td>
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<td>DoD 44630.8</td>
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<td>Part 3.4.9 10 USC 2366</td>
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<td>Live Fire Test &amp; Evaluation (LFT&amp;E) Report ³</td>
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<td>Part 6.3.2 10 USC 2366</td>
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<tr>
<td>Legality of Weapons Under International Law</td>
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<td>Legality of Weapons Under International Law ³</td>
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<td>Part 1.4.4 10 USC 2400</td>
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<tr>
<td>Manpower Estimate ³</td>
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<td>Part 3.5.2 10 USC 2434</td>
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<tr>
<td>Mission Need Statement (MNS)</td>
<td>X</td>
<td>Part 2.3 CJSI 3170.01</td>
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<td>Operational Requirements Document (ORD)</td>
<td>X X X</td>
<td>Part 2.3 CJSI 3170.01</td>
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<tr>
<td>Overarching IPT (O IPT) Leader's Report ⁴</td>
<td>X X X</td>
<td>Part 3.4.1</td>
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<td>O IPT Staff Assessments ⁴</td>
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<td>Program Office Estimate (POE) (life cycle costs)</td>
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<td>Part 3.5.1 DoD 5000.4</td>
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<td>Provisions for Evaluation of Post Deployment Support</td>
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<tr>
<td>Requirement for Program Under DoD Strategic Plan</td>
<td>X X X</td>
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<td>Test &amp; Evaluation Master Plan (TEMP)</td>
<td>X X X</td>
<td>Part 2.2</td>
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<tr>
<td>Test Results (DT&amp;E, OT&amp;E, FT&amp;E, etc..)</td>
<td>X X X</td>
<td>Part 3.4.11 10 USC 2399</td>
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<tr>
<td>System Threat Assessment ³</td>
<td>X X</td>
<td>Part 6.3.1 10 USC 139</td>
</tr>
</tbody>
</table>

¹ Including CAIV based objectives.
² MS 0 for ACAT IA; MS I for ACAT I. May be useful if updated for MS II; unlikely to be required at Milestone III.
³ Normally not applicable to ACAT IA.
⁴ ACAT ID and ACAT IAM programs only.
### DSMC PROGRAM MANAGERS TOOL KIT

**Information For Milestone Reviews**

**ACAT II and III* Programs**

<table>
<thead>
<tr>
<th>Information Element</th>
<th>Milestone</th>
<th>Reference</th>
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<tbody>
<tr>
<td>NOTE: MDA may waive non-statutory requirements</td>
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<tr>
<td>Acquisition Program Baseline (APB)*</td>
<td>X</td>
<td>DoDD 5000. 1, D, 3, g DoDD 5000. 2-R, 3.2.2</td>
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<tr>
<td>Acquisition Strategy</td>
<td>X</td>
<td>DoDD 5000. 2-R, 3.3</td>
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<td>Affordability</td>
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<td>DoDD 5000. 1, D, 1.a DoDD 5000. 2-R, 2.</td>
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<tr>
<td>Environmental Safety &amp; Health (ESH) Assessment*</td>
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<td>DoDD 5000. 2-R, 3, 3, 7 42 USC 4321-47</td>
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<td>Interoperability Certification (C3I Systems)</td>
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<td>DoDI 4690. 8</td>
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<tr>
<td>Legality of Weapons Under International Law</td>
<td>X</td>
<td>DoDD 5000. 1, D, 2, j</td>
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<tr>
<td>Life Cycle Cost Estimate</td>
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<td>DoDD 5000. 1, D, 1.g DoDD 5000. 2-R, 3.5.1</td>
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<tr>
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<td>X</td>
<td>DoDD 5000. 2-R, 3, 4, 9 10 USC 2366</td>
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<tr>
<td>Live Fire Test &amp; Evaluation Report*</td>
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<td>DoDD 5000. 2-R, 6, 3, 2 10 USC 2366</td>
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<td>Low Rate Initial Production (LRIP) Quantities*</td>
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<td>Mission Need Statement (MNS)</td>
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<td>CJSI 3170. 01 DoDD 5000. 2-R, 2.3</td>
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<td>Operational Requirements Document (ORD)</td>
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<td>CJSI 3170. 01 DoDD 5000. 2-R, 2.3</td>
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<tr>
<td>Risk Assessment*</td>
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<td>Staff Assessments</td>
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<td>DoDD 5000. 1, D, 2, g</td>
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<td>Test &amp; Evaluation Master Plan (TEMP)*</td>
<td>X</td>
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<tr>
<td>Test Results (DT/DTLFT &amp; E)</td>
<td>X</td>
<td>DoDD 5000. 2-R, 6, 3.1 10 USC 139</td>
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</tbody>
</table>

**MDA's for ACAT II & III* programs have wide latitude and broad authority over the content and format of many (but not all) of these information elements**

Notes:
1. Including Cost as An Independent Variable (CAIV) based objectives.
2. May be included in PM's acquisition strategy.
3. Normally not required for AIS programs.
4. Programs subject to live fire T&E legislation.
5. ACAT II only; how ever, it is DoD Policy to limit LRIP quantities for all ACATs.
6. Programs on OSD T&E Oversight List.

*Army, Navy and Marine Corps also have an ACAT IV category. The information on this chart may also be tailored for those programs.*
S&T LINKAGE TO DEFENSE ACQUISITION PROCESS

DETERMINATION OF MISSION NEED

<table>
<thead>
<tr>
<th>PHASE 0</th>
<th>PHASE I</th>
<th>PHASE II</th>
<th>PHASE III</th>
<th>DEMILITARIZATION &amp; DISPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCEPT EXPLORATION</td>
<td>PROGRAM DEFINITION &amp; RISK REDUCTION</td>
<td>ENGINEERING &amp; MANUFACTURING DEVELOPMENT</td>
<td>PRODUCTION, FIELDING/DEPLOYMENT, &amp; OPERATIONAL SUPPORT</td>
<td></td>
</tr>
</tbody>
</table>

(1) MS 0 Approval to Conduct Concept Studies
(2) MS I Approval to Begin a New Acquisition Program
(3) MS II Approval to Enter Engineering & Manufacturing Development
(4) MS III Production or Fielding/Deployment Approval

Warfighting Needs & R&D Objectives

- Oversight panel

Systems S&T

- Adv Tech Dev (6.3a)
  - Oversight panel
  - STOP

Tech Base (6.1/6.2)

- Basic Research
- Applied Research

Options

(1) Concepts for new systems/upgrade systems out of production.
(2) Insert into ongoing systems development, or complete ACTD development.
(3) Upgrade system in production/fielded systems or produce mature ACTD.
(4) Use of new technology for demilitarization/disposal.
ACTD INITIATION PROCESS

Pressing Need (Users)

Teaming

Technical Idea (Developers)

Acquisition User Team + ASC/Staff

1 Hour Review

DUSD(ASC) Review

1 Hour Briefing

Approved for further consideration

Joint Staff/JROC recommendation

DUSD(ASC) Decision

Approve

User/Acquisition Team Kick-off & Development

PROCEED

Quit

DDRE Breakfast Club Review & Discuss

1/2 Hour Briefing

not selected

Advise

Rework

Rework

*Advanced Systems Concepts staff will assist, if necessary, to arrange user/developer team*
## ACQUISITION PROGRAM VS. ATD & ACTD

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Acquisition Program</th>
<th>Advanced Technology Demonstration (ADT)</th>
<th>Advanced Concept Tech Demonstration (ACTD)</th>
</tr>
</thead>
</table>
|                             | • Develop, produce and field system  
|                             | • Cost, schedule, performance        | • Demonstrate feasibility and maturity  
|                             |                                  | • Reduce technical risks and uncertainties                  | • Gain understanding of and evaluate utility prior to acquisition decision  
|                             |                                  | at relatively low cost                                   | • Develop concepts of operation and doctrine |
| Requirement                 | MNS/ORD               | not required                           | not required                               |
| Oversight                   | milestone decision authority    | labs/R&D centers                          | DUSD(ASC)                                   |
|                             |                      |                                         | Oversight Panel                           |
| Funding                     | fully FYDP funded     | RDT&E                                   | RDT&E (2yrs in field)                      |
| ACAT                        | I, II, III            | not ACAT effort                         | not ACAT effort                            |
| Configuration & Testing     | system/subsystem prototypes DT/OT | technology demonstrations              | tech demonstrations in field environment with users ACTD |
| Rules                       | DoD 5000 series/FAR   | informal/FAR                           | Mgmt Plan/FAR                              |
| Role of User                | max involvement       | some involvement                       | max involvement                            |

FAR: Federal Acquisition Regulation  
MNS: Mission Need Statement  
ORD: Operational Requirements Document  
DUSD(AT): Deputy Under Sec Def (Advanced Technology)  
FYDP: Future Years Defense Program  
RDT&E: Research, Dev, Test & Eval (appropriation)  
ACAT: Acquisition Category  
DT/OT: Developmental/Operational Testing
PLANNING RELATIONSHIPS
Engineering & Manufacturing Development Phase

1. Requirements Generation
   - update ORD
   - M&E/MOP
   - update TEMF
   - Sys Threat Assess
   - APB propose
   - DT&E Report
   - OT&E Report
   - BLRP Report
   - LFT&E Report

2. Acquisition Management
   - Life Cycle
     - JROC-OPT-DAB-ADM
     - update acquisition strategy
     - update CARD
     - update Life Cycle Resource Est.
     - Technical Review(s)
       - (final Dev Spec draft Prod Spec)
       - PRP(s)
       - PCA
     - AP
     - Final SSP
     - Final RFP
     - Proposal - Award

3. PPBS
   - update POM
   - Budget
   - Appropriation
   - Budget Authority (for Production)
**PROGRAM STRUCTURE/SCHEDULE (EXAMPLE)**

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*MDA usually approves advance procurement for LRIP.*
DoD INTERNATIONAL ARMAMENTS
COOPERATION POLICY

SECDEF Memorandum 23 March 1997

“It is DoD policy that we utilize International Armaments Cooperation to the maximum extent feasible, consistent with sound business practice and with overall political, economic, technological, and national security goals of the United States.”
DEFENSE SALES VS. COOPERATIVE ACQUISITION

They are Different

- Defense Sales
  - Any nation
  - U.S. Contracts (FMS)
  - U.S. Manages
  - Production & Support
  - DoS or DoC
    + DoD - USD (Policy)
  - Foreign Initiated
  - Foreign Funds (or U.S. Credit/Grants)

- Cooperative Acquisition
  - Allied or Friendly
  - U.S., Ally or NATO
  - Jointly Managed
  - All Acquisition
  - DoD - USD (A&T)
    + DoS and DoC
  - U.S. and/or Foreign
  - U.S. + Foreign Funds

INTERNATIONAL ACTIVITIES ASSOCIATED WITH DEFENSE ACQUISITION PHASES

Cooperative Production
  - Coproduction
    - Licensed Production
    - Production Sharing
  - Foreign Military Sales

Cooperative Development
  - Intl. Testing

Program Definition and Risk Reduction

Production, Fielding/Deployment, & Operational Support

Engineering and Manufacturing Development

NATO Forums
  - DEAs/IEPs
  - Staff Talks
  - S&E Exchanges

Determining Mission Need and Identifying Deficiencies

Concept Exploration
THE SCOPE OF DEFENSE COOPERATION

RDT&E
- Information Exchanges
- Engineer & Scientist Exchanges
- Cooperative R&D
- Comparative or Joint Testing
- Standardization

Production & Procurement
- Foreign Military Sales
- Direct Commercial Sales
- Cooperative Production (Joint Funds)
- Coproduction/Licensing (Foreign Funds)
- Reciprocal Procurement

Follow-on Support
- Cooperative Logistics Supply Support
- Mutual Support Exchanges
- Logistics Support
- Host Nation Support Defense Industrial Base

The Program Manager's Focus
### Resource Allocation Process - Overlap

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## PROCUREMENT APPROPRIATIONS
(ACCOUNT NUMBERS AND BUDGET ACTIVITIES)

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<td><strong>Army (21 -)</strong></td>
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<tr>
<td>Ammo</td>
<td>- 2034 1. Ammo 2. Ammo Production Base Support</td>
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<td><strong>Navy (17 -)</strong></td>
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<td>Ammo</td>
<td>- 1508 1. Ammo, Navy 2. Ammo, Marine Corps</td>
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<td><strong>Marine Corps (17 -)</strong></td>
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**DSMC PROGRAM MANAGERS TOOL KIT**

**PROCUREMENT APPROPRIATIONS**

(Account Numbers and Budget Activities)

(Continued)

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<thead>
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<th>Appropriation</th>
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<td>Air Force (57-)</td>
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<td></td>
<td>5. Modification of In-Service Aircraft 6. Aircraft Spares &amp; Repair Parts</td>
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<td>7. Aircraft Support Equipment &amp; Facilities</td>
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<td>Missile</td>
<td>- 3020 1. Ballistic Missiles 2. Other Missiles 3. Modification of In-Service Missile</td>
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<td>4. Spares &amp; Repair Parts 5. Other Support</td>
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<td>- 3011 1. Ammo 2. Weapons</td>
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<td>4. Other Base Maintenance &amp; Support Equipment 5. Spares &amp; Repair Parts</td>
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<td>National Guard &amp; Reserve Equipment</td>
<td>- 0350 1. Reserve Equipment 2. National Guard Equipment</td>
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<td>- 0360 1. Defense Production Activity Purchases</td>
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### RDT&E Appropriations (Account Numbers)

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### RDT&E Appropriations (Relationship Between Budget Activities and Research Categories)

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<td>4</td>
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<td>Dem/Val</td>
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**NOTES:**

1. Budget Activities specified by DoD 7000.14-R; Research Categories specified by DoD 7045.7-H

2. While the title of the Acquisition Life Cycle phase preceding EMD is now called Program Definition and Risk Reduction (PDDR) in Acquisition Directives, Financial Management Directives still refer to budget activity associated with this acquisition phase as Demonstration Validation.

* Oversight by DDR&E
**DSMC PROGRAM MANAGERS TOOL KIT**

**SAMPLE**

**NAVY APPROPRIATIONS AND BUDGET ACTIVITIES**

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<th>APPRN/ BUDGET ACTIVITY</th>
<th>RESEARCH CATEGORY</th>
<th>BELOW THRESHOLD REPROGRAM RULES *</th>
<th>YEARS AVAILABLE FOR OBLIG PURPOSES</th>
<th>FUNDING POLICY</th>
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<td>4 6.3b Dem/ Val</td>
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<td>5 6.4 EMD</td>
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<td>6 6.5 RDT&amp;E Mgmt Supp (T&amp;E Ranges) (Civilian Salaries)</td>
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<td>7 6.6 Oper. Systems Devel. (Post-Production)</td>
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</table>

*Below Threshold Reprogramming for RDT&E (for PEs) allowed for each year funds avail for obligation.
DSMC PROGRAM MANAGERS TOOL KIT

PRODUCT IMPROVEMENTS
Funding Decision Tree

IF ....

THEN ....
Fund Development and Testing with ....
(To include the Mod Kits used for Testing)

AND ....
Fund Purchase of the Mod Kits and installation of those Mod Kits on the Fielded System with ....

BELOW THRESHOLD REPROGRAMMING

<table>
<thead>
<tr>
<th>APPN</th>
<th>MAX INTO</th>
<th>MAX OUT</th>
<th>LEVEL OF CONTROL</th>
<th>OBL AVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDT&amp;E</td>
<td>+ $4M</td>
<td>GREATER CF</td>
<td>PROGRAM ELEMENT</td>
<td>2 YEARS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $10M, - 10 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC</td>
<td>+ $10M</td>
<td>GREATER CF</td>
<td>LINE ITEM</td>
<td>3 YEARS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- $15M, - 20 %</td>
<td></td>
<td>(SCN: 5 YEARS)</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>+ $15M</td>
<td></td>
<td>BUDGET ACTIVITY</td>
<td>1 YEAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SOME DA 1 SUB-ACTIVITY LIMITATIONS ON DECREASES (OPERATING FORCES)</td>
<td></td>
</tr>
<tr>
<td>MILPERS</td>
<td>+ $10M</td>
<td>NO CONGRESSIONAL RESTRICTION</td>
<td>BUDGET ACTIVITY</td>
<td>1 YEAR</td>
</tr>
<tr>
<td>MILCON</td>
<td>LESSOR OF $2M</td>
<td>NO CONGRESSIONAL RESTRICTION</td>
<td>PROJECT</td>
<td>5 YEARS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ 25%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference Sources: DoD Financial Management Regulation, Volume 3 (Dec 98)
Report from the Senate Conference Committee on Appropriations re Reprogramming of FY98 and later Fiscal Year O&M Appropriations
COST ESTIMATING

<table>
<thead>
<tr>
<th>Type of Estimates</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogy -</td>
<td>Comparison to one similar existing system; based on judgments. Little or no data available; Relatively quick, easy, flexible Used in early phases (e.g., CE)</td>
</tr>
<tr>
<td>Parametric -</td>
<td>Comparison to many similar existing systems; based on statistical analysis Determine primary cost drivers and Establish Cost Estimating Relationships (CERs) Used in early phases (e.g., CE, PDRR)</td>
</tr>
<tr>
<td>Engineering or &quot;Bottoms-Up&quot;</td>
<td>Summation of “all” individual items in the system Uses WBS structure Used in middle phases (e.g., EMD)</td>
</tr>
<tr>
<td>Extrapolation -</td>
<td>Comparison to historical cost of same system Based on extrapolation from actuals Uses Learning Curve Theory Used in late phases (e.g., production and replenishment spares)</td>
</tr>
</tbody>
</table>

Guidelines
1. Make sure cost data is relevant and homogeneous. Caution: Watch out for historical data in times of change. Prior actuals may include uncompensated overtime or were priced as a "buy-in."
2. Focus on cost drivers.
3. Test sensitivities and data relationships.

Cost Estimating Relationships (CER) - (Parametric)
PERFORMANCE MEASUREMENT

COST & SCHEDULE PERFORMANCE MEASUREMENT

1. Define the work (WBS) t Level
2. Schedule the work
3. Allocate budgets

Defining, Planning and Budgeting

WBS

Element/Cost Account - 300

<table>
<thead>
<tr>
<th>Task</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task A</td>
<td>$10</td>
</tr>
<tr>
<td>Task B</td>
<td>$3</td>
</tr>
<tr>
<td>Task C</td>
<td>$4</td>
</tr>
<tr>
<td>Tasks D-X</td>
<td>$45</td>
</tr>
</tbody>
</table>

Work Packages (9 month coverage) Planning Packages (remainder of effort)

4. Prepare and monitor performance profiles

VARIANCES

<table>
<thead>
<tr>
<th>VARIANCE</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Variance</td>
<td>CV = BCWP - ACWP</td>
</tr>
<tr>
<td>Schedule Variance</td>
<td>SV = BCWP - BCWS</td>
</tr>
<tr>
<td>Cost Variance %</td>
<td>CV% = BCWP - ACWP</td>
</tr>
<tr>
<td>Schedule Variance %</td>
<td>SV% = BCWP - BCWS</td>
</tr>
</tbody>
</table>

TIME

COST

TERMINOLOGY

BCWS - Budgeted Cost of Work Scheduled
ACWP - Actual Cost of Work Performed
BCWP - Budgeted Cost of Work Performed
MR - Management Reserve
EAC - Estimate at Completion (Gover)
LRE - Latest Revised Estimate (Contractor)
BAC - Budget at Completion
CBB - Contract Budget Base(CTC+AUW)
CTC - Contract Target Cost
PMBS - Performance Measurement Baseline
AUWP - Auth Unpriced Work

PERFORMANCE INDICES

Cost Performance Index CPI = \( \frac{BCWP}{ACWP} \)
Schedule Performance Index SPI = \( \frac{BCWP}{BCWS} \)

Percent Complete = \( \frac{BCWP\text{ (cum)}}{BAC} \)
Percent Spent = \( \frac{ACWP\text{ (cum)}}{BAC} \)

ESTIMATE AT COMPLETION

EAC = \( \frac{BAC}{CPI\text{ (cum)}} \)
EAC = \( \frac{BAC - BCWP\text{ (cum)}}{(CPI\text{ (cum)}} - SPI\text{ (cum)}} \)

TO COMP PERFORMANCE INDICES

TCPI(EAC) = \( \frac{BAC - BCWP\text{ (cum)}}{EAC - ACWP\text{ (cum)}} \)
CONTRACTING

COMPONENTS OF CONTRACT PRICE

\[
\text{Contract Price} = \text{Cost} + \text{Product/Fee}
\]

- Direct Cost
  - Direct Labor
  - Direct Material
  - Other Direct Cost (ODC)
  - Engrg
  - Mfg
  - Raw Labor
  - Material
  - Std Comm Items
  - Purchased Parts
  - Subcontracts
- Indirect Cost
  - Overhead
  - FCCM
  - G&A
  - Engrg
  - Mfg
  - Mat'l
  - Spt
  - Spt
  - Handling

TYPICAL CONTRACT TYPE BY PHASE

<table>
<thead>
<tr>
<th>CE</th>
<th>PDRR</th>
<th>EMD</th>
<th>PROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPFF, FFP</td>
<td>CPFF, CPIF</td>
<td>CPIF, CPAF</td>
<td>FPI(F), FFP</td>
</tr>
</tbody>
</table>

TYPES OF CONTRACTS

Cost Family: Appropriate when product not well defined; high risk; contractor provides best efforts; Government pays all allowable costs. Fee varies by type.

Cost Plus Fixed Fee (CPFF) - Fee same regardless of actual cost outcome.

Cost Plus Incentive Fee (CPIF) - Actual fee earned computed by applying share ratio to over/under run, subject to min/max fee limits.

Fixed Price Family: Product well defined, low risk; contractor must deliver product.

Firm Fixed Price (FFP) - Price fixed regardless of actual cost incurred.

Fixed Price Incentive Firm Target [FPI(F)] - Final price computed by applying share ratio to over/under run, subject to ceiling price limitation.

Award Fee (AF) - Either stand alone Cost Plus Award Fee (CPAF) or combined with cost or fixed price types. AF unilaterally determined by government based on subjective evaluation of contractor’s performance.

Fee Limits: CPFF - Fee limited to 15% for R&D; 10% for Production and services. No statutory or FAR/DFARS regulatory limitation on other contract types.
DSMC PROGRAM MANAGERS TOOL KIT

CONTRACT TYPE FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Fixed Price</th>
<th>Cost Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promise</td>
<td>Delivery</td>
<td>Best Efforts</td>
</tr>
<tr>
<td>Contractor Risk</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Cash Flow</td>
<td>Delivery</td>
<td>As Incurred</td>
</tr>
<tr>
<td>Progress Payments %</td>
<td>75/90/95</td>
<td>N/A</td>
</tr>
<tr>
<td>Administration</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Fee Limit %</td>
<td>None</td>
<td>15/10/6 on CPFF</td>
</tr>
</tbody>
</table>

**CPFF**

\[ \text{PRICE} = \text{COST} + \text{FIXED FEE} \]

Risk Highest To The Government
Obtains Fee Regardless of Cost

**CPIF**

\[ \text{(Target) PRICE} = \text{(Target) COST} + \text{(Target) FEE} \]

All Reasonable Cost Paid
Shared Risk Between Min/Max Fee
CONTRACT TYPE FEATURES
(Continued)

\[ \text{FPI(F)} \]

\[ \text{PROFIT} \]

Target Profit

Share Ratio

PTA

CEILING PRICE

\[
\text{(Target) PRICE} = (\text{Target) COST} + (\text{Target) Profit}
\]

Point of Total Assumption = \( \frac{\text{CEILING PRICE} \cdot \text{TARGET PRICE}}{\text{GOVERNMENT SHARE}} \) + Target Cost (PTA)

\[ \text{FFP} \]

\[ \text{PROFIT} \]

\[
\text{PRICE} = \text{COST} + \text{PROFIT}
\]
DSMC PROGRAM MANAGERS TOOL KIT

PRE-SOLICITATION PROCESS

Requirement → Market Research → Acquisition Strategy → Acquisition Plan

Source Selection Plan/Strategy → Finalize RFP

Post Draft RFP on Electronic Bulletin Board → CBD Notice Advisory Multi-Step

CBD Notice of RFP Release → RFP Release to Industry

RFP Release Briefing to SSA

POST-SOLICITATION PROCESS

Receipt of Oral & Written Proposals → Initial Eval Clarifications Limited Communications → Competitive Range Determination

Face-to-Face Discussions/ Negotiations → Receive & Analyze Field Surveys (if requested) → Prepare for Discussions with Remaining Offerors

Request Final Proposal Revision → Receive & Analyze Final Revision

Brief SSAC → Brief SSA

Debrief Unsuccessful Offerors → Contract Award (Distribution) → SSA Decision
OTHER WAYS TO BUY

• **GSA Multiple Award Schedules (MAS)**
  - General Services Administration contracts for both products and services available to all agencies.

• **Government Wide Agency Contract (GWACs)**
  - similar to MAS but more restricted in products and services available.

• **Indefinite Delivery/Indefinite Quantity Contracts**
  - Task orders (services) & Delivery Orders (products)
    issued under omnibus umbrella contract.

• **Other Transactions (See Separate OT Chart)**

OTHER TRANSACTIONS

**Defined:** Vehicles used for basic, applied and advanced research projects and prototype development. OTs are not Contracts, Grants, or Cooperative Agreements.

**Objective:** Attract commercial companies and consortia that historically have not done business with the Department of Defense because of statutory and/or regulatory requirements. OTs are not subject to the Federal Acquisition Regulation. Designed to increase DoD access to dual use Technologies.

**Research Projects:**
• Where practical, government cost share should not exceed cost share of other parties.
• Use OT when standard Contract, Grant or Cooperative Agreement is not appropriate.

**Prototype Projects:**
• Must be directly relevant to weapons or weapon systems proposed to be acquired or developed by DoD.
CONTRACTOR PROFITABILITY RATIOS

The basic concept of profitability ratios is to measure income against revenue or against the investment required to produce it. There are three principal profitability ratios with which you should be familiar. They are:

\[
\text{Return on Sales} = \frac{\text{Net Income}}{\text{Sales}}
\]

1. Return on Sales which shows what percentage of dollars are left after the company has paid for all costs, interest, and taxes. It is expressed as:

\[
\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}
\]

2. Return on Total Assets which looks at the efficiency with which management has used its resources, the company’s assets, to generate income. It is computed as:

\[
\text{ROA} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}
\]

As noted, ROA addresses how well management utilizes the assets of the firm in generating income. The ROA formula reflects the combined result of Return on Sales and the total asset turnover ratio (sales/total assets), broken down as follows:

\[
\text{ROE} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Common Stockholders' Equity}}
\]

3. Return on Common Stockholder’s Equity measures the rate of return on the owners’ investment—their equity in the company. This is also known as Return on Equity (ROE).

\[
\text{ROE} = \frac{\text{Net Inc. - Pref. Div.}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Common Stockholder's Equity}}
\]

ROE can also be broken into two components: these being return on assets adjusted for preferred dividends and financial leverage (a ratio reflecting the relationship of creditor to owner financing—expressed as total assets/ common stockholders equity). This is shown by:

\[
\text{Earnings Per Share} = \frac{\text{Net Income Minus Preferred Dividends}}{\text{Number of Shares of Common Stock Outstanding}}
\]

These profitability ratios give three different viewpoints concerning the “bottom line” on the income statement—how much net profit is being made on each sale, how much is being made for the assets that are employed, and how much is being made for the company owners. From an owner’s perspective, another profitability ratio you may be aware of is Earnings Per Share (EPS):
### DSMC PROGRAM MANAGERS TOOL KIT

**FINANCIAL ANALYSIS SHEET**  
*(EXAMPLE)*

#### MCDONNELL DOUGLAS CORP

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (M$)</th>
<th>Return on Sales (%)</th>
<th>Asset Turnover</th>
<th>ROA</th>
<th>ROA x</th>
<th>Financial Leverage</th>
<th>Boot Value</th>
<th>EPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>19842</td>
<td>Y91</td>
<td>1.90</td>
<td>1.24</td>
<td>2.39</td>
<td>2.39</td>
<td>3.83</td>
<td>6.16</td>
<td>9.16</td>
</tr>
<tr>
<td>17073</td>
<td>Y92</td>
<td>4.02</td>
<td>1.26</td>
<td>5.06</td>
<td>5.06</td>
<td>4.56</td>
<td>23.10</td>
<td>23.10</td>
</tr>
<tr>
<td>14474</td>
<td>Y93</td>
<td>2.48</td>
<td>1.20</td>
<td>2.99</td>
<td>2.99</td>
<td>3.52</td>
<td>14.52</td>
<td>14.52</td>
</tr>
<tr>
<td>13162</td>
<td>Y94</td>
<td>4.54</td>
<td>1.08</td>
<td>4.90</td>
<td>4.90</td>
<td>3.15</td>
<td>15.44</td>
<td>15.44</td>
</tr>
</tbody>
</table>

-2.2% % change from Y90 to Y95: -251% 10% -266% -66% -10% -249% -249% -21% -219%

#### DUPONT ANALYSIS

**RCE (%) (Net sales):**

- Y91
- Y92
- Y93
- Y94
- Y95

**Asset Turnover (sales/TA):**

- Y91
- Y92
- Y93
- Y94
- Y95

**ROA (%) (NI/TA):**

- Y91
- Y92
- Y93
- Y94
- Y95

**Financial Leverage (TA/SE):**

- Y91
- Y92
- Y93
- Y94
- Y95

**ROE (%) (NI/SE):**

- Y91
- Y92
- Y93
- Y94
- Y95

**Book Value Per Share (SE/Shares of common stock):**

- Y91
- Y92
- Y93
- Y94
- Y95

**EPS (NI of shares of common stock):**

- Y91
- Y92
- Y93
- Y94
- Y95

---

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CASH CYCLE

Contract award

Cash received

Raw material inventory

Accounts payable

Work in process inventory

Accounts payable

Finished goods inventory

Wages payable

Cash disbursed

Sale (DD 250)

CONTRACTOR FINANCING AND PAYMENTS

FINANCING (External*)

Commercial
- Govt specified
- Offer or proposed
- Interim
- Advance

Non-Commercial
- Private
  - Trade Credit
  - Bank Credit
    - Revolving Credit
    - Term Loan
- Government
  - For Non-Commercial
    - Progress Payments
      - Performance Based
      - Cost Incurred Based
      - % Complete
    - Unusual Progress Payments
      - Assignment of Claims
      - Guaranteed Loans
      - Advance Payments

PAYMENTS

Commercial
- Delivery

Non-Commercial
- Periodic
- Partial

* Internal Contractor Financing
  - Retained Earnings
SUPPORTABILITY ANALYSES

Anything analytical that has something to do with logistics

- SUPPORTABILITY ANALYSIS (SA)
The tailored application of engineering efforts during acquisition, to identify/solve logistics issues through an iterative SE process of definition, synthesis, tradeoff, T&E.

- LOGISTICS MANAGEMENT INFORMATION (LMI):
The documentation associated with SA.

BEST PRACTICE:
Supportability Analyses

- Tailored!
- Part of iterative SE process
- Assists in
  - Defining support
  - Influencing design
- Uses (not duplicates) other data & analyses
- Documented and communicated
### BEST PRACTICE: SUPPORTABILITY ANALYSIS ACTIVITIES

#### Phases

- **Concept Exploration**
- **Preconception**
- **Analysis Strategy**
- **SA Planning and SA Plan**
- **Operation & Sustainment Support Requirements**
- **Operations and Sustainment Support Alternatives**
- **Operations and Sustainment Support Tradeoff Analyses**
- **Operations Reviews and Control**
- **Analysis of Comparative Systems**
- **Evaluation of Technology Approaches / Opportunities**
- **Determination of Supportability Requirements / Constraints**
- **Operations & Sustainment Support Resources**
- **SA Reviews and Control**
- **Definition of Intended Use / O&S Environment of System**

#### System Analysis and Control

- **Requirements**
- **Emerging Designs**
- **O&S Support Planning**

#### DSMC PROGRAM MANAGERS TOOL KIT
ACQUISITION LOGISTICS

1. Maintenance Planning - establishes maintenance concepts and requirements.

2. Manpower & Personnel - identification of personnel skills and grades required to support operation and maintenance of system.

3. Supply Support - determine requirements to acquire and manage spare and repair parts.

4. Technical Data - scientific and technical information used to support systems acquisition.

5. Training & Training Support - determine requirements to acquire training devices and conduct training of operators and maintenance personnel.

6. Computer Resources Support - identification of facilities, hardware, software and support tools to operate and support embedded computer systems.

7. Facilities - identify real property required to support system.

8. Packaging, Handling, Storage and Transportation - identify designs and methods to ensure the system is preserved, packed, stored, handled and transported properly.

9. Support Equipment - identify all equipment required to support operation and maintenance of the system.

10. Design Interface - relationships of logistics related design parameters to readiness and support resource requirements; influence design for supportability.
PROGRAM OFFICE ORGANIZATION STRUCTURES

Functional Structure

```
PM
   ↓
  STAFF
```

```
ENGRNG  BUSINESS  PRODUCTION  LOGISTICS
```

"Pure" Product Structure

```
PM
   ↓
   PM SYSTEM A  PM SYSTEM B  PM SYSTEM C
```

```
STAFF  STAFF  STAFF
```

```
FUNCTIONAL DIVISIONS  FUNCTIONAL DIVISIONS  FUNCTIONAL DIVISIONS
```
INTEGRATED PRODUCT TEAMS

SYSTEM PROGRAM DIRECTOR

DIR OF LOG  DIR OF ENG  DIR OF TEST

PIT

DIR OF CONTRACTS  DIR OF FIN MGT  DIR OF PROJECTS

AIR VEHICLE IPT  ENGINE IPT  SUPPORT SYS IPT  TRAINING SYS IPT

IPT = Integrated Product Team
PIT = Program Integration Team

Note 1: IPTs mirror Work Breakdown Structure
ROLE OF MANUFACTURING MANAGEMENT WITHIN THE INTEGRATED PRODUCT TEAM

**DEVELOPMENT**
- INFLUENCE THE DESIGN PROCESS
- PREPARE FOR PRODUCTION

**PRODUCTION**
- EXECUTE THE MANUFACTURING PLAN
- REFLECT DESIGN INTENT
- REPEATABLE PROCESSES
- PROCESS IMPROVEMENT

**UNIFORM, DEFECT-FREE PRODUCT**
- CONSISTENT PERFORMANCE
- LOWER COST

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VARIABILITY CONTROL

- GOAL: Minimize and control manufacturing variation on key product characteristics
- WHY: Direct correlation between deviation from nominal value on key characteristics and product quality and functionality
- TOOLS: QFD, DOE, Process control chart (Statistical Process Control, see below)

*Note: No lower control limit for R Chart for sample size below 7.
MANUFACTURING PROCESS ELEMENTS

THE FIVE M's

MANPOWER  MEASUREMENT

RELEASED DESIGN  PROCESS TRANSFORMATION  PRODUCED PRODUCT

METHOD  MACHINERY  MATERIALS

ENVIRONMENTAL CONSIDERATIONS
DSMC PROGRAM MANAGERS TOOL KIT

KEY MANUFACTURING QUESTIONS
TO ASK Ktr REGARDING QUALITY

1. What engineering design tools are being used during development
to integrate manufacturing processes and affordability into the
design?

Answer should include:
• Integrated Product Teams
• Quality Function Deployment (QFD)
  -- Disciplined process employing multifunctional processes.
  (What? and How to do it?)
  -- IPTs to get voice of customer into design
  -- Matches customer desires with technical solutions
  -- Technical solutions rated
• Design for Manufacturing and Assembly (DFMA)
  -- Focuses on defining product design options for ease of
    fabrication and assembly
• Design of Experiments (DOE)
  -- Identifies process factors most likely to impact quality of the
    end item

2. How will management determine that equitable requirements
tradeoffs are made between design and manufacturing processes
during development?

Answer should include:
• Perform producibility analysis during design of developement
  hardware
  -- Tradeoff design requirements against manufacturing risk, cost,
    production volume and existing process capability/availability

3. Of those manufacturing processes which do not exist or are
unproved, what is plan to prove them out?

Answer should include:
• Compare program needs to work being done under DoDs
  Manufacturing Science and Technology Programs or individual
  service laboratory technology measurement program
  -- Avoid "reinventing the wheel" syndrome

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KEY MANUFACTURING QUESTIONS
TO ASK Ktr REGARDING QUALITY
(Continued)

• Milestone driven process development schedule which yields
demonstrated process capability in factory representation
environment before rate production begins

  -- Alternatives for key process considered as risk reduction if
    affordable

4. How does the contractor plan to insure I receive a quality product?
   Answer should include:

   • ISO 9000 or equivalent quality system (basic quality system) in
     place and consistently followed

   • Advanced Quality System (AQS) encouraged
     -- Key product characteristic identification
     -- Process/product variability control (SPC)
     -- Process capability assessment (Cp, Cpk)
     -- AQS flowdown to suppliers
     -- Integrated product development
     -- Process fool proofing (Poka-Yoke)
     -- Closed loop root cause corrective action (five whys)

5. What is your cost of quality (% if gross unit price spent on failure,
   appraisal, prevention)?

   World Class Company = 5-10%
   (Further breakout of 10% shown below)
DSMC PROGRAM MANAGERS TOOL KIT

TEST & EVALUATION

DT&E/OT&E COMPARISONS:

DT&E
- Tech. perf. measurement
- Dev. agency rsp. (PM)
- Technical Personnel
- Ltd. test articles/each test
- Controlled environment
- All types of Test Articles
- Contract or involved

OT&E
- Operational effective/suitable
- Operational Test Agency (OTA) resp.
- "Typical" User Personnel
- Many test articles/each test
- "Combat" environment
- "Production Rep" Test Articles
- Contractor may not be allowed

T&E Required before going Beyond Low Rate Initial Production Production Qualification T&E - Verify Production Article meets Spec/PM responsible Performed by Contractor &/or Government/DPRO assistance valuable.

Live Fire T&E (LFT&E) - Vulnerability and Lethality/Dev't Agency fund and execute. DOTE oversight, approval and congressional reporting for selected programs.

Initial Operational T&E - Operational Effectiveness and Suitability/Independent Svc OTA plan and manage. DOTE oversight, approval, and Congressional reporting for selected systems.

T&E TASKS & EVENTS

- Test Rqmts
- Test Interfaces
- Test Strategy
- Sys. Engineering
- Design for Test
- S/W Human T&E
- Subsystem T&E
- Software Only T&E

System DT&E
- CSCI T&E
- R. A. M.
- Supportability
- Survivability
- Interoperability
- Production QuaL
- Live Fire T&E
- Cert of Readiness for IOT&E

System OT&E
- Effectiveness
- Suitability

Use Combined DT/OT - single integrated DT and OT Team; combined testing; independent data analysis & reporting.

ACAT I & II Programs - require an independent, dedicated IOT&E to proceed beyond Low Rate Initial Production.

AGONIZE OVER THRESHOLDS!
Modeling & Simulation Planning Process

Establish a Program-level Simulation Working Group

PMO monitor, update, & continuously explore new opportunities

Earlier the better - M & S Planning

Include all Service activities with M&S expertise. Determine opportunities for M&S throughout the program lifecycle.

Immediately consider complete digital integrated database operation; examples:
- Boeing 777
- NSSN Attack Submarine
- Comanche.

Integral part of program planning

Consider:
Fidelity
Re-use
Balance
Integration
Verification
Validation
Accreditation
Scheduling
Budgets

Identify VV&A activities for all M&S.

Coordinate & document in a simulation support plan and the TEMP. Get ALL T&E organizations to support your M&S usage via formal TEMP agreement.
Hierarchy of Models and Simulations

RESOLUTION
Increasing Aggregation Comparative Results
Design Manufacturing Cost Support Development Tech Req'ts Dev.

FUNCTIONS SUPPORTED
Operational Req'ts Development Effectiveness Analysis Tactics Development Mission Planning & Rehearsal
Test & Evaluation

MODELS & SIMULATIONS
Mission/Battle (Groups of Systems-Force Package)
Engagement (One-on-One)
Engineering (System/Subsystem/Component)

FORCE OR SYSTEM LEVEL
Joint/Combined Forces Corps
Air Wings Battle Groups

The Hierarchical Aggregation of Models reduces Fidelity significantly & must be evaluated. - (PM, DIS & DMSO)
The Evolution of Modeling & Simulation

Simulation Based Acquisition is the process by which simulation is incorporated and integrated throughout the functions of the acquisition of a weapon system; from concept exploration, through prototyping and design, test and evaluation, fabrication and production, to deployment and finally operations and sustainment using an integrated database for seamless use between & by functional areas.

Simulation Based Acquisition
Virtual prototyping examples of different size, complexity & capability
PLANNING AND CONTROL

TYPICAL TIMES FOR PROGRAM ACTIVITIES

<table>
<thead>
<tr>
<th>Event</th>
<th>Time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement Request Development Time</td>
<td>6 - 9</td>
</tr>
<tr>
<td>Contract Lead-time</td>
<td>9 - 12</td>
</tr>
<tr>
<td>DAB Lead-time</td>
<td>6 - 8</td>
</tr>
<tr>
<td>PDRR Design, Fab and Test</td>
<td>24 - 30</td>
</tr>
<tr>
<td>EMD Design, Fab and Qual</td>
<td>30 - 36</td>
</tr>
<tr>
<td>Test Readiness Review Lead-time</td>
<td>2 - 3</td>
</tr>
<tr>
<td>DT&amp;E</td>
<td>9 - 12</td>
</tr>
<tr>
<td>OT Readiness Review Lead-time</td>
<td>2 - 3</td>
</tr>
<tr>
<td>OT&amp;E</td>
<td>6 - 12</td>
</tr>
<tr>
<td>OT Report Preparation</td>
<td>3</td>
</tr>
<tr>
<td>Production Lead-time</td>
<td>18 - 30</td>
</tr>
</tbody>
</table>

TYPES OF PLANNING CHARTS

MILESTONE CHART (Gantt)

Time Period

Activity:
Design  
Fab  
Integrate  
Gnd. Test  
Qual  
Ft. Test  
Produce

- Advantages: Simple
- Disadvantages: Difficult to show dependencies between activities unless computer constructed chart.

(ADD'L TYPES OF PLANNING CHARTS ON NEXT 5 PAGES)
PLANNING AND CONTROL

NETWORK CHART

<table>
<thead>
<tr>
<th>TASK</th>
<th>TASK #</th>
<th>TIME</th>
<th>COST</th>
<th>ACCELERATE</th>
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<tbody>
<tr>
<td>Brief</td>
<td>1-2</td>
<td>5</td>
<td>2,200</td>
<td>-</td>
</tr>
<tr>
<td>Transport</td>
<td>2-3</td>
<td>4</td>
<td>15,000</td>
<td>500</td>
</tr>
<tr>
<td>Ship GFE</td>
<td>2-6</td>
<td>7</td>
<td>2,500</td>
<td>600</td>
</tr>
<tr>
<td>Ship system</td>
<td>2-4</td>
<td>4</td>
<td>4,600</td>
<td>750</td>
</tr>
<tr>
<td>Inspect</td>
<td>4-6</td>
<td>5</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Train maint.</td>
<td>3-6</td>
<td>21</td>
<td>28,000</td>
<td>800</td>
</tr>
<tr>
<td>Train oper.</td>
<td>3-5</td>
<td>17</td>
<td>23,000</td>
<td>800</td>
</tr>
<tr>
<td>Integ. sys.</td>
<td>6-7</td>
<td>6</td>
<td>13,500</td>
<td>-</td>
</tr>
<tr>
<td>Dry Run</td>
<td>7-8</td>
<td>7</td>
<td>9,000</td>
<td>400</td>
</tr>
</tbody>
</table>

- Advantages: Shows dependencies; computes critical path
- Disadvantages: Complex; computerized support required to maintain
  Does not provide any chronology

SWAN CHART

- USE TASKS & TIMES FROM CHART ABOVE

- Advantages: Shows chronology and dependencies
- Disadvantages: Complex; computerized support required to maintain
**PERT NETWORK CHARTS**

Most widely-used PERT Display using scheduling software:

```
    5
BRIEF 7 SHIP GFE
       | 6
       | INTEG RATE
       | 7 DRY RUN
       | 21 TEST
       | 30 GOVT ANALYZE
       | 5 GOVT REPORT
       | 45 KTR ANALYZE
       | 7 KTR REPORT

TRAIN 17
       | 4
TRANS 17 TROOPS
       | 21 TRAIN MAINT
       | 4 SHIP SYS
       | 5 INSPECT
```

Normal PERT Display for manual method:

```
   5
BRIEF 4 TRANS TROOPS
       | 6
       | 7 SHIP GFE
       | 6 INTEG RATE
       | 7 DRY RUN
       | 21 TEST
       | 30 GOVT ANALYZE
       | 10 GOVT REPORT
       | 45 KTR ANALYZE
       | 12 KTR REPORT
```

*PERT = Program Evaluation & Review Techniques*
LEAD TIME CHART

1. (PURCHASE PART)
2. (PURCHASE PART)
3. (SUB-CONTRACT PART)
4. (FABRICATED PART IN-HOUSE)
5. (SUB-ASSEMBLY "B")
6. (PURCHASE PART)
7. (SUB-ASSEMBLY "A")
8.  
9.  
10. TEST
11. SHIP
12. FINAL ASSEMBLY

WORKING DAYS PRIOR TO COMPLETION (LEAD TIME)
26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
LINE OF BALANCE TECHNIQUE

Snapshot in time: 1 May
This chart illustrates the concept of threshold, objective, exit criteria, and a breach based on PM’s current estimate.

* Here the current estimate falls below the threshold. If probability of survivability is a KPP in the APB, this would be a performance threshold breach.
RISK MANAGEMENT PROCESS MODEL

**Risk Management Planning/Prep**
- Process Preparations
- Process Plans & Controls
- Organization & Training
- Schedule Budget & MIS

**Risk Assessment**
- Risk Event Identification
- List of Risk Events
- Risk Analysis

**Risk Handling**
- Risk Handling Option Identification
- List of Top Risks
- Risk Integration
- Risk Descriptions

**Risk Handling Option Analysis**
- Best Options
- Risk and Risk Handling Option Integration

**Risk Monitoring/Reporting**
- Statute Reports
- Risk Monitoring & Reporting
- Revised Best Handling Options
- Revised Top Risk List
- Risk Mgt Plan (Implemented)
RISK & TRADE-OFF ANALYSIS

RISK MANAGEMENT

1. Develop program plans to the work package level.
2. Assess risk at the lowest work package/WBS level.
3. Manage the highest risk work packages; most others will work out.

TRADE-OFF ANALYSIS

1. Identify alternative solutions
2. Select evaluation criteria/factors & MOEs; i.e. cost, schedule, performance criteria
3. Weight evaluation criteria
4. Develop utility functions for each factor
5. Conduct evaluation (weighted utility summary table where weight is multiplied by utility function value)
6. Perform sensitivity check
7. Select highest scored alternative

*With Cost As an Independent Variable (CAIV), aggressive cost objectives are established as a result of trading performance and schedule for cost.
TECHNICAL PERFORMANCE MEASUREMENT
THE CONCEPT

- Planned Profile
- Achievement to date
- Tolerance Band
- Current Estimate
- Planned Value
- Variation
- Objective

TECHNICAL PARAMETER VALUES
e.g. MTBF

Milestones
TIME
Threshold
Systems Engineering Process

**PROCESS INPUT**
- Customer Needs/Objectives/Requirements
  - Missions
  - Measures of Effectiveness
  - Environments - Constraints
- Technology Base
- Output Requirements From Prior Development Effort
- Program Decision Requirements
- Requirements Applied Through Specifications and Standards

**System Analysis & Control (Balance)**
- Trade-Off Studies
- Effectiveness Analyses
- Risk Management
- Configuration Management
- Interface Management
- Data Management
- Performance Measurement
  - SEMS
  - TPM
  - Technical Reviews

**Requirements Loop**
- Requirements Analysis
  - Analyze Missions & Environments
  - Identify Functional Requirements
  - Define/Refine Performance & Design Constraint Requirements

**Functional Analysis/Allocation**
- Decompose to Lower-Level Functions
- Allocate Per formance & Other Limiting Requirements to All Functional Levels
- Define/Refine Functional Interfaces (Internal/External)
- Define/Refine/Integrate Functional Architecture

**Design Loop**
- Design
  - Transform Architectures (Functional to Physical)
  - Define Alternative System Concepts, Configuration Items & System Elements
  - Select Preferred Product & Process Solutions
  - Define/Refine Physical Interfaces (Internal/External)

**Verification**
- Transform Architectures (Functional to Physical)

**Synthesis**
- Define Alternative System Concepts, Configuration Items & System Elements
- Select Preferred Product & Process Solutions
- Define/Refine Physical Interfaces (Internal/External)

**PROCESS OUTPUT**
- Development Level Dependent
  - Decision Data Base
  - System/Configuration Item Architecture
  - Specifications & Baselines
REQUIREMENTS ANALYSIS QUESTIONS

- What are the reasons behind the system development?
- What are the customer expectations?
- Who are the users and how do they intend to use the product?
- What do the users expect of the product?
- What are their level of expertise?
- What environmental characteristics does the system have to comply with?
Functional Analysis/Allocation

- Allocate Functions
- Decompose Higher Functions
- Allocate Performance
- From Higher to Lower Functions
- Functional Descriptions
- Functional Flow Block Diagrams
- Time Line Analysis
- Functional Architecture
HELP!

- How do I make decisions? — Trade Studies
- Will it do job/worth the $$? — Effectiveness Analysis
  (Cost As an Independent Variable (CAIV))
- Are we doing the right thing? — Risk Mgmt
- Do we know what we have? — Config Mgmt
- Will it all work together? — Tech Perf Meas
- What should the contractor be doing? — Statement of Work
- Are we ready to go on? — Tech Reviews
- How do I run this program? — Sys Engr Planning
New Science & Technology (S&T) Strategy

PRINCIPLES:
1- WARRIOR NEEDS
2- LOWER COSTS
3- SPT MIL-COMM IND BASE
4- PROMO RESEARCH
5- QUALITY

DUAL USE, COMMERCIAL APPLICATIONS

DIRECT TRANSFER

DDRE "BREAKFAST CLUB"

TECH BASE

(6.1,6.2,6.3a $$$)

DOD CAP'BTY

ADVANCED TECHNOLOGY DEMONSTRATOR

ADV CONCEPT TECHNOLOGY DEMONSTRATOR

DSMC PROGRAM MANAGERS TOOL KIT
1. Use Performance-Based Specifications

2. Cancel/Convert Manufacturing and Management Standards to Performance or Nongovernment Standards (NGSs)

3. Encourage Contractors to Submit Alternative Solutions to Military Standards/Specifications

4. Prohibit Use of Military or commercial Specifications/Standards in Contract Except when Authorized by SAE or Designee
DSMC PROGRAM MANAGERS TOOL KIT

SPECS, REVIEWS, AUDITS & CM

SPECIFICATIONS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>WHEN</th>
<th>APPR</th>
<th>BASELINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>PDRR</td>
<td>SFR</td>
<td>Functional</td>
</tr>
<tr>
<td>Item Perf</td>
<td>PDRR</td>
<td>PDR (HW)</td>
<td>Allocated</td>
</tr>
<tr>
<td>Item Detail</td>
<td>EMD</td>
<td>PCA</td>
<td>Product</td>
</tr>
<tr>
<td>Process</td>
<td>EMD</td>
<td>PCA</td>
<td>Product</td>
</tr>
<tr>
<td>Material</td>
<td>EMD</td>
<td>PCA</td>
<td>Product</td>
</tr>
</tbody>
</table>

REVIEWS, SPECS, BASELINES AND AUDITS

SYSTEM REVIEW DEFINITIONS (Based on EIA Interim Std (IS) 632)

ASR - Alternative Systems Review - Preferred System Solution meets needs
SRR - Systems Requirements Review - Preliminary functional requirements
SFR - Systems Functional Review - Approve functional requirements
SSR - Software Specification Review - Approve S/W allocated requirements

Note: EIA Interim Std (IS) 632 deletes use of "A", "B", "C", "D", and "E" designators.
DSMC PROGRAM MANAGERS TOOL KIT

SPECS, REVIEWS, AUDITS & CM
(Continued)

DEFINITIONS (Continued)

PDR - Preliminary Design Review  - Approve HW allocated requirements
   - Establish H/W allocated baselines

CDR - Critical Design Review   - Preliminary product requirements
   - Ready for fabrication

PRR - Production Readiness Review - Assess producibility/manuf. readiness
   - Assess test readiness

TRR - Test Readiness Reviews   - Approve test plans

FCA - Functional Configuration Audits - Verify CIs perform to spec

SVR - System Verification Review - Verify CIs perform as "system"

PCA - Physical Configuration Audit - Verify CIs "as built" documentation

CONFIGURATION MANAGEMENT

Four functions:

1. Configuration Identification - family of specs and drawings that describes
   the system or configuration item (CI)

2. Configuration Control - management of changes to a CI via the
   configuration control board (CCB)

3. Configuration Status Accounting - management information system that
   provides traceability of configuration ID and changes thereto

4. Configuration Audits - validate development requirements are achieved
   and tech documentation is complete and accurate

Engineering change - alteration in the approved configuration ID of a CI

Two types - Class I: proposed change affecting established CI baselines,
   supportability, interoperability or contractual factors.
   - Class II: All other engineering changes
SOFTWARE MANAGEMENT

• Nine Principle Best Practices to Improve Software Development, Reduce Costs, and Increase User Satisfaction*
  - Formal Risk Management
  - Agreement Interfaces
  - Peer Reviews/Inspections/Walk-throughs
  - Metric-Based Scheduling and Management
  - Binary Quality Gate, at Inch-Pebble Level
  - Program-wide Visibility of Project Progress vs. Plan
  - Defect Tracking Against Quality Targets
  - Configuration Management
  - People-Aware Management Accountability

• Nine Project “Breathalyzer” Questions to provide “Quick Look” at Software Project Health**
  - Do you have a current, credible activity network supported by a work breakdown structure (WBS)?
  - Do you have a current, credible schedule and budget?
  - Do you know what software you are responsible for delivering?
  - Can you list the current top 10 project risks?
  - Do you know your schedule compression percentage?
  - What is the estimated size of your software deliverable? How was it derived?
  - Do you know the percentage of external interfaces that are not under your control?
  - Does your staff have sufficient expertise in the project domains?
  - Have you identified adequate staff to allocate to the scheduled tasks at the right time?

*“Little Yellow Book of Software Management Questions” (Software Program Managers Network)
**“Project Breathalyzer: Questionnaire Software Health”, Software Program Managers Council
DSMC PROGRAM MANAGERS TOOL KIT

WORKING GROUPS

TEAM DEVELOPMENT WHEEL

- Performing
- Creative
- Trusting
- Effective
- Confident

- Forming
- Milling
- Confusion
- Polite
- Purposeless

- Norming
- Cohesion
- Purpose
- Feedback
- Relevancy

- Storming
- Conflict
- Frustration
- Resistance
- Cliques

RECOGNIZE WHICH PHASE OF TEAM DEVELOPMENT YOU ARE IN AND TAKE POSITIVE ACTION TO WORK THROUGH

TYPICAL WORKING GROUPS

- Logistics Support Management Team (LSMT)
- Test & Evaluation Working Group (TEWG)
- Computer Resources Working Group (CRWG)
- Requirement Interface Working Group
- Interface Control Working Group (ICWG)
- Technology Assessment Working Group
- "Tiger" Team
- Process Action Team
- Integrated Product & Process Teams
WORKING GROUPS
(Continued)

*Group Consensus* - all group members must accept a solution and live with the consequences. Until you have this agreement, you don't have consensus. Guidelines for achieving:

1. Avoid arguing for your own opinion.
2. Go for "win-win" solutions.
3. Do not change mind to avoid conflict.
4. Avoid majority vote, coin-flipping, horse-trading.
5. Expect differences of opinion.

MANAGEMENT TRADE-OFFS
FOR WORKING GROUPS

*Advantages*
- More ideas & solutions
- Consensus positions
- Strong commitments

*Disadvantages*
- Takes more time
- Hard to terminate
- Paralysis by analysis
LEADERSHIP & MANAGERIAL SKILLS

- More things that make you go "Hmmm?..."

"An authority is a person who just happens to know the source."

"A conservative is a person who believes nothing should be done the first time."

"Diplomacy is the art of hearing all parties arguing in a dispute and nodding to all of them without ever agreeing with any of them."

"The meeting raised our confidence that the contractor can actually accomplish the task and that it will occur in our lifetime."

"This is the earliest I've been late."

"The world would be a much better place if people weren't allowed to have children until they've proven they can successfully manage a DoD program."

"Leadership problems account for 80% of all acquisition problems."
DELEGATION

REASONS FOR DELEGATING

1. Improve manager’s time management
   a. Increase manager’s span of control
   b. Increase time allocated to long range planning
   c. Increased management efficiency
2. Assure tasks performed by most qualified
3. Build organizational depth
4. Improve employee motivation
5. Increased teamwork (IPTs/TQM)
6. Maximize resources
7. Appropriate organizational responsibility

12 STEPS FOR DELEGATING

1. Set clear objectives and task statements
2. Select "Delegate"; check qualifications
3. Provide training, if necessary
4. Solicit input from Delegate
5. Assign task and deadline
6. Provide any relevant guidance
   a. Critical information required to do tasks right
   b. Potential approaches - only as suggestions!
   c. Describe results desired
7. Makes a delegation "contract" (see next page)
8. Establish controls
9. Maintain controls
10. Provide feedback
11. Identify lessons learned
12. Evaluate performance

DELEGATION STATUS FILE

3 File Sections to hold all delegation records

I. Current Month
   - Sectioned for 31 calendar days
   - File delegation records by suspense month
II. Remaining 11 months
   - Section for each month
   - File delegation records by suspense month
III. Completed Records
   - File alphabetically by Delegate name
   - Use data for performance evaluations
DELEGATION RECORD

<table>
<thead>
<tr>
<th>Description of Action:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Person Assigned:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authority Level (specify):</th>
<th>Frequency of Contact (specify):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Take action; do not report back</td>
<td>1 - daily</td>
</tr>
<tr>
<td>2 - Take action; report back (see Frequency)</td>
<td>2 - weekly</td>
</tr>
<tr>
<td>3 - Prepare plan; proceed upon approval</td>
<td>3 - monthly</td>
</tr>
<tr>
<td>4 - Do only as directed below</td>
<td>4 - other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delegation Guidance/Agreements:</th>
<th></th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Suspense Action:</th>
<th>Suspense Date:</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Assessment:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
EFFECTIVE MEETINGS

PRE-MEETING
A. Establish type of meeting
   1. Information (quick, crisp)
   2. Planning/Strategizing (slow, deliberate)
   3. Problem solving (divergent/convergent)
   4. Decision (deliberate)
   5. Staff/Conference (repetitive, short)
   6. Feedback/Evaluation (slow, contemplative)
   7. Training (smooth, flowing)
   8. Social (rambling)
B. Select participants
   1. Based on purpose; relevant; decision auth.
   2. Size: 4-7 ideal; 10-12 tolerable; >13 unsat.
C. Circulate agenda (3-5 days in advance)
   1. Type, purpose, date, place, start/finish times
   2. Topics, time allocated (minutes), speakers
   3. Assign recorder

CONDUCTING MEETING
A. Opening
   1. Start on time
   2. Repeat type and purpose of meeting
B. During
   1. Facilitate the meeting
   2. Encourage openness and communication
   3. Develop cohesion
   4. Use active listening
   5. Stick to agenda
C. Closing
   1. Set time and date of next meeting
   2. Summarize agreements, actions, decisions
   3. Close on time or before

AFTER MEETING
A. Review minutes with recorder
B. Publish minutes
TOTAL QUALITY MANAGEMENT

Quality: consistent conformance to customer expectations

Seven Elements of Total Quality
1. Customer Focus - who they are and what they expect
2. Systems Perspective - the org. is a system with technical and social aspects
3. Process Management - understand processes to provide needs of the customer
4. Continuous Improvement - if it ain't perfect yet, improve it!
5. Individual Involvement - people who do and understand work must be involved
6. Teamwork - coordination of effort to produce timely, quality product
7. Leadership Commitment - leaders at all levels focused on total quality

Deming's Fourteen Obligations of Top Management
1. Create constancy of purpose for improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier.
5. Improve constantly and forever every process for planning, production, and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force and numerical goals of management.
12. Remove barriers that rob people of pride of workmanship.
   Eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement for everyone.
14. Put everybody in the company to work to accomplish the transformation.
PERSONAL COMMUNICATIONS

DIRECTIVE
- Give advice
- Evaluate
- Motivate
- Explain
- Reassure

Advantages
- Effective with inexperienced personnel
- Quick
- Take charge attitude

Disadvantages
- Perceived insulting
- Does not support delegation
- Manager keeps responsibility

NON-DIRECTIVE
- Don't display authority
- Listen carefully
- Don't advise
- Facts only; no opinions
- Employee find solution

Advantages
- Develops commitment
- Good training
- Employee responsible
- Supports delegation

Disadvantages
- Takes time
- Skill/patience required
- Ineffective with inexperienced personnel

COUNSELING PROCESS

1. Set up interview - private, confidential, unhurried
2. Encourage discussion - open questions, active listening
3. Help employee think it through - deal with facts, no opinions or own views
4. Let them find the solution - their solution to their problem
PERSONAL COMMUNICATIONS
(Continued)

WIN-WIN NEGOTIATIONS

FOCUS: Defeat the problem; not the person

APPROACH:
- Resolve conflict
- Reach agreement
- Normalize relationships
- Combine efforts

GOAL:
- Acceptable gains by both parties

INTER-PERSONAL NEGOTIATIONS

1. Separate people and emotions from the problem
2. Focus on interests, not positions
3. Generate options for mutual gain
4. Insist on objective criteria
PROBLEM SOLVING

CREATIVE PROBLEM SOLVING
1. List perceived problems
2. Gather relevant data
3. Define actual problem
4. Determine alternative solutions
5. Analyze and evaluate alternatives
6. Select solution
7. Validate solution

DIVERGENT THINKING*
1. Accept all ideas and alternatives
2. Defer judgement or evaluation
3. Discuss, combine, hitchhike, improve ideas
4. When exhausted, move to converge

CONVERGENT THINKING*
1. Establish categories of alternatives
2. Develop evaluation criteria
3. Avoid premature closure
4. Keep eye on objective
5. List strengths and weaknesses
6. Select best alternative or idea

*Used sequentially during all problem-solving steps
# DSMC PROGRAM MANAGERS TOOL KIT

## PROBLEM SOLVING
(Continued)

### QUALITATIVE PROBLEM SOLVING
(Kepner-Tregoe)\(^1\)

Deviation Statement: (Describe the actual performance vs should performance)

<table>
<thead>
<tr>
<th>Specifying Question</th>
<th>Is</th>
<th>Is Not</th>
<th>What is distinctive about “Is” vs “Is Not”?</th>
<th>Does the distinction suggest a change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What? (Identify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where? (Location)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When? (Timing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extent? (Magnitude)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Possible Causes:

Most Likely Cause:

1. Define deviation.
2. Describe what deviation IS and IS NOT.
3. List distinctions between what deviation IS and IS NOT.
4. Do distinctions indicate or suggest a change?
5. Determine possible causes based on distinctions and changes.

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TIME MANAGEMENT

TIME ROBBERS AND AVOIDANCE TECHNIQUES

1. Incoming telephone calls
   - screen for importance
   - limit to 2 minutes

2. Outgoing telephone calls
   - do all at one time
   - itemize topics before calling
   - don't socialize

3. Unscheduled visitors
   - screen for importance
   - do not invite into office
   - remain standing

4. Improper delegation
   - re-delegate

5. Poorly conducted meetings
   - stay focused on subject area and on schedule
TIME MANAGEMENT
(Continued)

<table>
<thead>
<tr>
<th>HIGH IMPORTANCE</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>URGENCY</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>MID-TO-LONG</td>
<td></td>
</tr>
<tr>
<td>RANGE PLANNING</td>
<td></td>
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<tr>
<td>BUSY WORK</td>
<td></td>
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<tr>
<td>VERIFY &amp; RE-ASSIGN</td>
<td></td>
</tr>
<tr>
<td>DO IT NOW</td>
<td></td>
</tr>
</tbody>
</table>

1. List all tasks.
2. Categorize tasks using matrix.
3. Review quadrant 3 items; re-assign as 1, 2, or 4 as appropriate.
4. Do quadrant 1 tasks first; consider delegating!
5. Strive to maximize time for quadrant 2 tasks (be proactive!).
6. When all 1 and 2 tasks are complete, do quadrant 4 tasks.

KEEP A "TO DO" LIST

1. List all goals and tasks.
2. Categorize as  A - High value
   B - Medium value
   C - Low value
3. Prioritize within each category (e.g. A-1, A-2, etc.).
4. Accomplish all A tasks, then all B. Do C if time permits.
5. Review list and priorities daily.
BRAINSTORMING

PURPOSE: To stimulate the free flow of ideas.

METHOD: Group members take turns generating ideas. One idea stimulates another and then another. Freewheeling of ideas is encouraged. Brainstorming stops when all group members run out of ideas. See the back of this page for questions that may suggest new ideas for you.

GROUND RULES:

- Put judgment aside. Remember, all ideas can be thought of as starters.

- No criticism allowed. This is not the time to judge an idea. Don’t criticize other ideas no matter how ridiculous they may seem. The ideas can be discussed in detail later; now, the objective is to generate more ideas.

- Welcome free-wheeling or blue-skying. Let those wild ideas come out—otherwise you may conceal your creative process. The impractical ideas may trigger other ideas that are possible to use.

- Strive for quantity, not quality. The more ideas brought out, the better the chance of a great solution.

- Combine and rearrange ideas. Single ideas aren’t the only way to make a suggestion. You can make additions or combinations of previously suggested ideas to create still better ideas.

- Record all ideas exactly as expressed. This keeps the mind free of remembering what was said and allows you to build on previous ideas.
BRAINSTORMING

(Continued)

Why does it work?

Some of the reasons why brainstorming enhances a group's creativity are that it:

- Increases involvement and participation.
- Produces the most ideas in the shortest time.
- Reduces the need to give the "right" answer.
- Frees up the group; allows the members to have fun and is interesting.
- Reduces the possibility of negative thinking.

QUESTIONS TO STIMULATE YOUR BRAIN CELLS:

1. Can we use this idea elsewhere? As is? With changes?
2. If we change it; Is there anything else like it? Any related issues?
6. Substitute? Who, what, when, where?
7. Reverse? Opposite, backwards, upside down, inside out?
DSMC PROGRAM MANAGERS TOOL KIT

DECISION BRIEFING

*Elements of a Decision Briefing*

- Purpose - Issues
- Outline - Agenda
- Background
- Assumptions
- Alternatives Identified
- Evaluation Criteria
- Analysis of Alternatives
- Recommendation
- Implementation Plan

*Things to Expect (from Briefer)*

- Challenges to assumptions, definitions, methodology
- Does it comply with or change policy?
- Is the situation sensitive to change?
- Issues with analysis, tradeoffs, recommendations, implementation
- Open/closed questions