# An Assessment of Acquisition Outcomes and Impact of Reforms & Initiatives

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# 2011 Assessment Made Observations On The Following

- Cost characteristics of the MDAP portfolio

- Timing and amount of knowledge achieved

- Progress of WSARA implementation

- Progress of DOD efficiency initiatives

# Cost Characteristics of DOD's Portfolio of Major Defense Acquisition Programs

# 08 to 10: Portfolio $ Investment Same, Programs Grew By a Net of Two

- **15 programs estimated at $77 billion entered**

- **13 programs estimated at $174 billion exited**

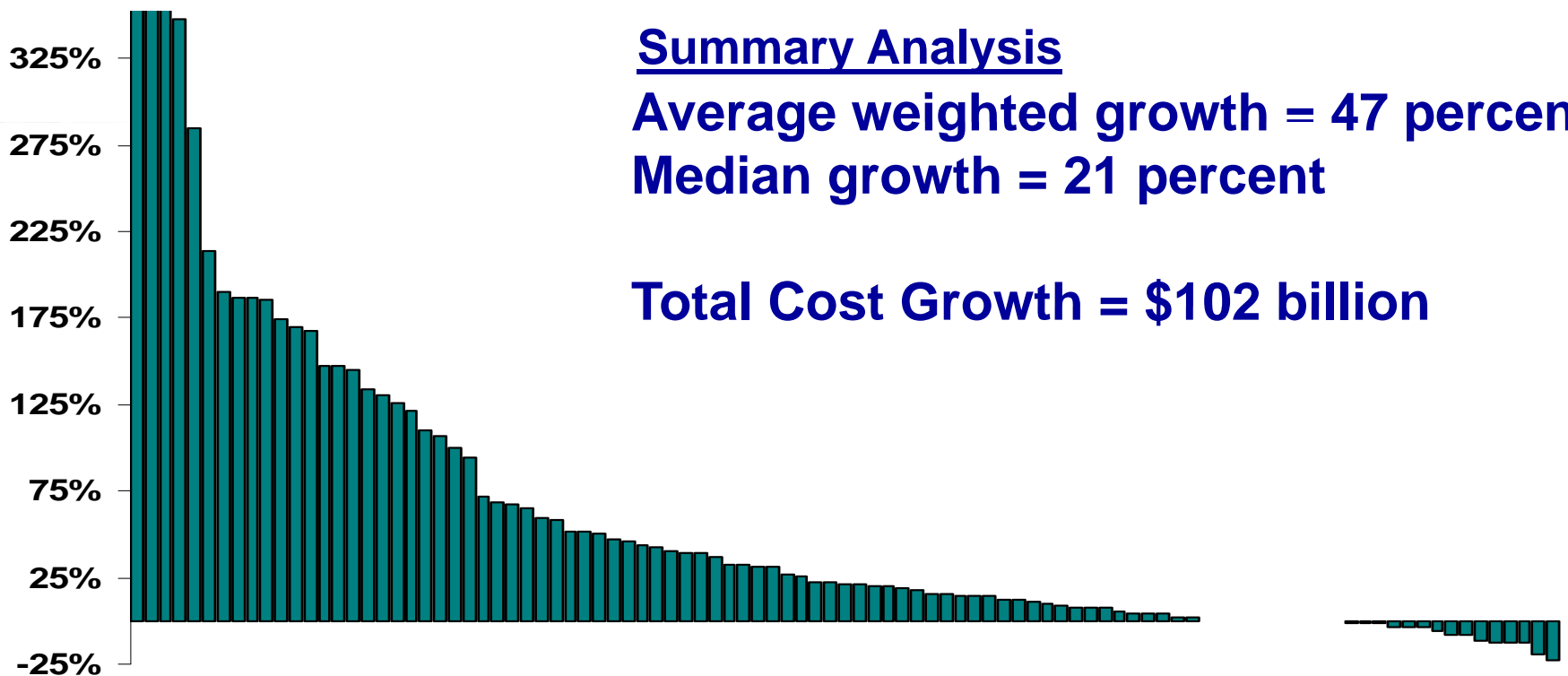| Portfolio status | Fiscal year 2008 | Fiscal year 2010 |
|---|---|---|
| Number of programs | 96 | 98 |
| Total planned investment | $1.64 trillion | $1.68 trillion |
| Funding expended | $834 billion | $968 billion |
| Funding to complete | $802 billion | $712 billion |

Source: GAO analysis of December 2007 and December 2009 Selected Acquisition Reports.

# 2yr/5yr/Baseline Trend: FY 2010 MDAP Portfolio Cost Growth Over Time

| FY 2011 dollars | Last 2 years (2008 to 2010) | Last 5 years (2005 to 2010) | Since first full estimate (Baseline to 2010) |
|---|---|---|---|
| Increase in estimated RDT&E costs | $15 billion<br>5 percent | $29 billion<br>10 percent | $102 billion<br>47 percent |
| Increase in estimated procurement costs | $121 billion<br>11 percent | $186 billion<br>18 percent | $287 billion<br>31 percent |
| **Increase in total acquisition cost** | **$135 billion**<br>**9 percent** | **$217 billion**<br>**16 percent** | **$402 billion**<br>**35 percent** |
| **Average delay in delivering initial capabilities** | **5 months**<br>**8 percent** | **9 months**<br>**13 percent** | **22 months**<br>**30 percent** |

Source: GAO analysis of December 2009 Selected Acquisition Reports.

# RDT&E Percentage Cost Growth From Baseline per MDAP



**Summary Analysis**

**Average weighted growth = 47 percent**

**Median growth = 21 percent**

**Total Cost Growth = $102 billion**

**Note: Four programs have greater than 325 percent RDT%E cost growth. The four programs that exceed 325% range from 348% to 3633%.**

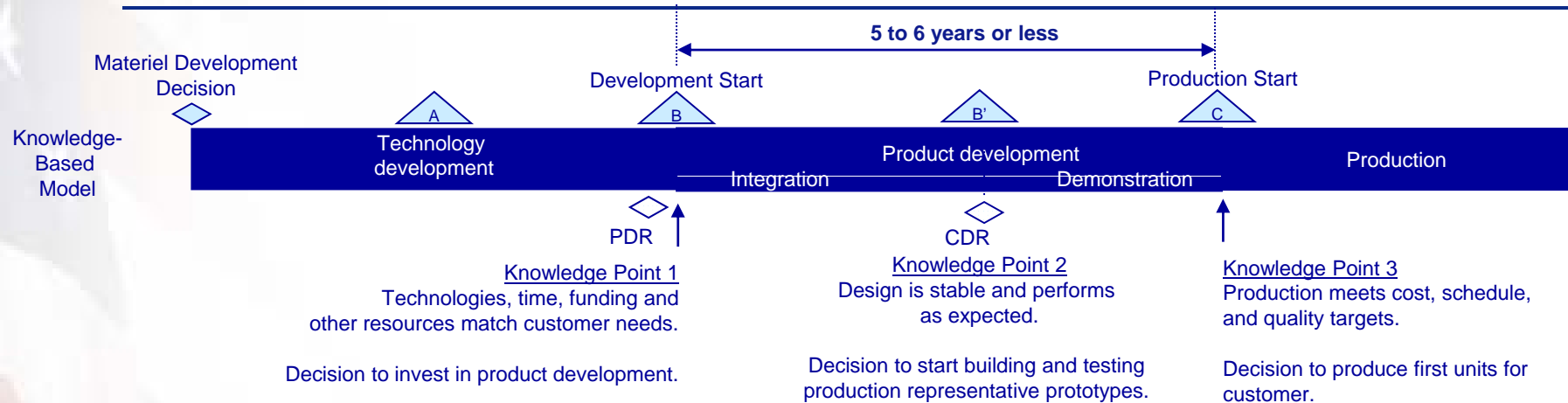# Impact of Quantity INCREASES on Program and Portfolio Cost

- 43 MDAPS had increased quantities since starting
  - Total quantities for all increased by 73%
  - Overall total program cost increased by 100%
  - A "calculated" cost for increased quantities is $175B
  - The **actual** cost increase was $258B

  - **The difference--$83B--can be thought of as inefficient cost growth or "bad" cost growth**

# Impact of Quantity DECREASES on Program and Portfolio Cost

- 30 MDAPS had decreased quantities since starting
  - Total proc cost actually increased for 13 programs
  - A "**calculated savings**" for decreased Q is $197B
  - The actual cost **INCREASED** by $2B

  - **The difference--$199B—can be thought of as lost buying power**

# Timing and Amount of Technology, Design, and Manufacturing Knowledge Achieved

# A Knowledge-Based Approach is Key to Successful Program Outcomes

**5 to 6 years or less**

Materiel Development Decision

Development Start

Production Start

Knowledge-Based Model

A

B

B'

C

Technology development

Product development

Production

Integration

Demonstration

PDR

CDR

Knowledge Point 1
Technologies, time, funding and other resources match customer needs.

Decision to invest in product development.

Knowledge Point 2
Design is stable and performs as expected.

Decision to start building and testing production representative prototypes.

Knowledge Point 3
Production meets cost, schedule, and quality targets.

Decision to produce first units for customer.

- Model provides framework for incremental, time certain (development constrained to 5 to 6 years or less), and knowledge-based approach to weapon system acquisitions.

- Success requires structured, disciplined application and adherence to model.

- Knowledge points align with key investment inflection points.

- Controls are in place for decisions makers to measure progress against specific criteria and ensure managers capture key knowledge before moving to next phase.

# Focus on Several Knowledge-Based Practices at Development Start

| Knowledge-based practices at development start<br>Knowledge point 1 | IAMD |
|---|:---:|
| Mature all critical technologies | ○ |
| Hold system requirements review | ● |
| Hold system functional review | ● |
| Hold preliminary design review | ○[a] |
| Constrain development phase to 6 years or less | ○ |

● Practice implemented by program

○ Practice not implemented by program

Source: GAO analysis of DOD data.

# Design Knowledge Increasing, but Prototypes Are Not Being Used

**Knowledge-based practices at design review**
Knowledge point 2

| | AB3 | FAB-T | CH-53K | GPS IIIA | Increment 1 E-IBCT | JPALS | JTRS AMF | PATRIOT/ MEADS CAP Fire Unit | Reaper |
|---|---|---|---|---|---|---|---|---|---|
| Mature all critical technologies | ○ | ○ | ○ | ● | ○ | ○ | ○ | ● | ● |
| Release at least 90 percent of design drawings | ○ | ○ | ● | ● | ○ | ● | ● | ● | ● |
| Test a system-level integrated prototype | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ░ |
| Use a reliability growth curve | ○ | ○ | ○ | ○ | ● | ● | ○ | ● | ○ |
| Conduct producibility assessments to identify manufacturing risks for key technologies | ● | ░ | ● | ● | ● | ░ | ● | ● | ░ |
| Complete failure modes and effects analysis | ● | ● | ● | ● | ● | | ● | ● | ░ |

● Practice implemented by program

○ Practice not implemented by program

░ Practice not applicable or information not available

Source: GAO analysis of DOD data.

# Programs Are Identifying Processes, But Not Demonstrating Them Pre-Prod

**Knowledge-based practices at production decision**
Knowledge point 3

| | AB3 | C-130 AMP | E-2D AHE | ER/MP UAS | GPS IIIA | Increment 1 E-IBCT | NMT | P-8A | SM-6 | WIN-T Increment 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Mature all critical technologies | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | ● |
| Release at least 90 percent of design drawings | ● | ● | ● | ● | ▓ | ○ | ▓ | ● | ○ | ▓ |
| Identify key product characteristics | ● | ● | ○ | ● | ▓ | ● | ● | ● | ● | ● |
| Identify critical manufacturing processes | ● | ● | ● | ● | ● | ● | ● | ● | ● | ▓ |
| Demonstrate critical processes are in statistical control | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ▓ |
| Demonstrate critical processes on a pilot production line | ● | ● | ● | ● | ○ | ● | ● | ● | ● | ▓ |
| Test a production-representative prototype | ● | ● | ● | ○ | ○ | ○ | ● | ○ | ○ | ● |

● Practice implemented by program

○ Practice not implemented by program

▓ Practice not applicable or information not available

Source: GAO analysis of DOD data.

# Progress of Acquisition
# Reforms and Efficiency Initiatives

# New DOD Policies Could Improve Outcomes

- **More discipline and up-front knowledge in early acquisition phases could put programs on more stable footing**
  - Early Materiel Development Decision required for all programs.
  - Preference for incremental development, with baselines for each increment.
  - PDR required before system development start.
  - Competitive prototyping required as part of technology development phase.
  - Configuration Steering Boards established to control requirements creep.
  - Acquisition strategies required to describe measures taken to ensure competition throughout the program lifecycle.
  - Trade-offs among cost, schedule, and performance objectives required at Milestone B approval to ensure affordability.

# Programs Have Begun to Implement DOD's Revised Acquisition Policies

- **Programs in our 2011 assessment have begun to implement acquisition reforms that could improve cost and schedule outcomes.**
  - Competitive prototyping – 9 of 14 pre-MDAPs planned to develop competitive prototypes prior to Milestone B.
  - Early systems engineering – 10 pre-MDAPs in our assessment have already scheduled a preliminary design review before Milestone B.
  - Trade-offs – 7 of 14 programs reported making major cost, schedule, and performance tradeoffs before development start
  - Competition – 6 of 14 programs are planning to incorporate competition into their acquisition strategy after Milestone B
- **Several programs in our 2011 assessment still have not reported holding a configuration steering board meeting.**
  - 12 of 40 programs in our assessment reported never having held a configuration steering board.
  - 5 programs presented de-scoping options to the board and 4 had those approved to help maintain cost and schedule.

# DOD Efficiency Initiative Can Help Further Reforms

- **Sets shorter programs timelines –** Requirements and proposed schedules must be consistent; justification for proposed program schedule is required before a program can proceed.

- **Treats affordability as a requirement –** Affordability is to be treated like a key performance parameter at Milestone A.

- **Stresses the use of systems engineering analysis –** At Milestone B, requires the presentation of a systems engineering tradeoff analysis showing how cost varies with schedule and design parameters.

- **Emphasizes competition throughout the program lifecycle –** Requires the presentation of a competitive strategy at each program milestone

- **Recommends portfolio analyses to eliminate redundancies –** Conduct portfolio reviews at the joint and Department-wide level to identify redundancies, as well as among smaller programs.

**END**