Working Group 3

Development Planning

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22 September 2011

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WG 3 – Development Planning

Theme –

"What type and level of analytics are needed to support informed investment decisions throughout development planning period – Pre- MDD thru MS A?"

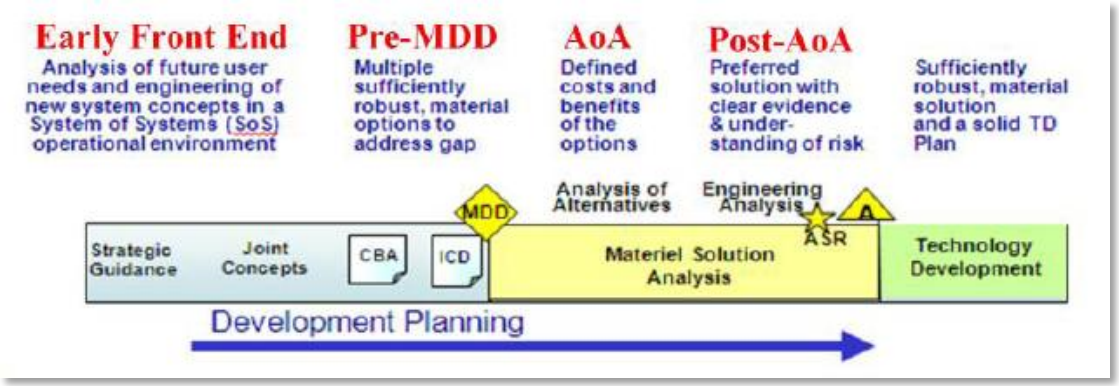
– Mr. Kendall, OSD(ATL)

Objectives –

- What analytics are required to support informed Acquisition decisions?
  - How to bound and manage Pre-MDD?
  - How to bound and Manage Pre-Milestone A?
- Where are the gaps?

MORS March 2010 Workshop: DP Working Group

- Identified 4 key opportunities which exist to achieve the upfront technical preparation required to ensure the successful selection and development of a materiel solution.



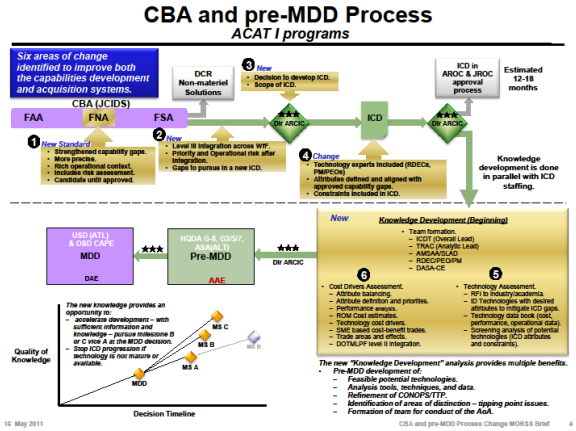
- Provided an outstanding opportunity to engage with several different communities and gain insight from a cross-section of participants to help inform the development of DP policy & guidance.
- Next Steps:
  - Findings utilized to develop DP guidance and policy
  - OSD(ATL) will host a government / industry DP workshop

Development Planning since MORS Workshop

- Established DP Policy influenced by the previous MORS DP Working Group
- Policy requires new evidence at MDD
  - The candidate materiel solution approaches have the potential to effectively address the capability gap(s), operational attributes and associated dependencies
  - There exists a range of technically feasible solutions generated from across the entire solution space, as demonstrated through early prototypes, models, or data
  - Consideration has been given to near term opportunities to provide a more rapid interim response to the capability need
  - The plan to staff and fund analytic, engineering, and programmatic activities supports the proposed milestone entry requirements
- Established Development Planning Working Groups to define sufficiency of evidence requirements and to improve DP implementation
- More emphasis placed by the Services on the pre-MDD and MDD to MS A phase analytics – cross-functional teams created
  - Identified pockets of good practices, but not institutionalized throughout DoD

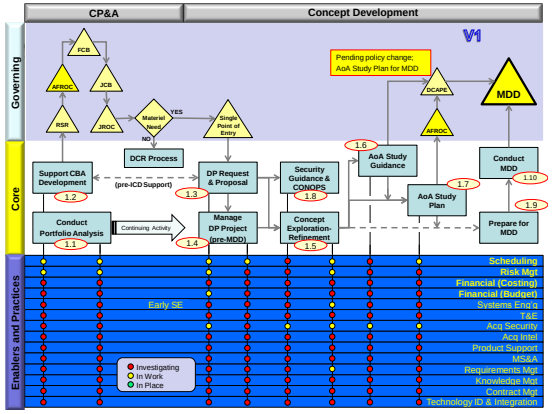
Department has made progress emphasizing Development Planning analytics, but more work is needed.

Development Planning Best Practice Examples

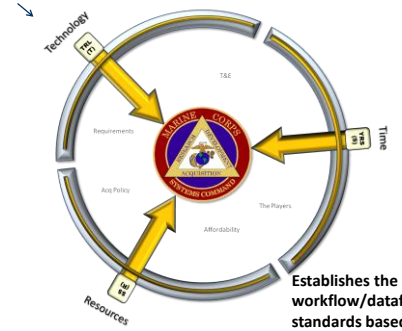


CCTD Content

1. Mission/Capability Need Statement/CONOPS (MOEs)
   - Stakeholders
2. Concept Overview (OV-1)
3. Trade Space Characterization
   - Scope
   - Assumptions and Constraints
   - Interfaces
   - Operating Environment (Draft Enabling CONOPS)
   - Key Parameters/Attributes/MOPs
   - Compliance Issues
4. Evaluation (Studies, Analyses, Experiments)
   - Common Assumptions and Methodologies
   - Parametric Studies
   - Analyses
   - Experiments
   - Modeling & Simulation (and Associated Data)
   - Evaluation Results
   - Conclusions
5. Concept Characterization/Design
   - Design Description & *Variants*
   - Concept of Employment
   - Architecture Considerations (Interfaces/Interoperability/SoS Approach/Integration)
   - Critical Design Constraints
   - Critical Technology Elements
   - Supportability/Sustainment/Logistics Features
   - Cost Drivers
   - Required Enabling Capabilities
6. Program Characterization / Implementation Analysis
   - Critical Technologies (including S&T needs/feed forward)
   - Technology Maturation Approach
   - T&E/V&V Approach
   - Prototyping Approach
   - Manufacturing/Producibility Approach
   - Sustainment/Supportability Approach
   - Other Relevant Considerations
   - Schedule Assumptions/Methodologies
   - Cost Analysis Assumptions and Methodologies
   - Cost Estimates
7. Risk Assessment and Decision-Certain Consequences
   - Operational Risk
   - Program Risk
   - Technology Risk
8. DOT_LPF Implications and other Interdependencies
9. Conclusions (Capability Description/Traceability to Need Statement)



Making Acquisition Decisions With FACT



- Dependent relationships are considered from the beginning.
- Efficient utilization of resources
- Complete understanding of the trade space
- Informed Requirements Setting

Establishes the required workflow/dataflow dependencies from a standards based architectural framework

Other Development Planning "Best" Practices

- Cross-functional teams
  - Requirements, acquisition, and budgeting
- System agnostic mission threads for capability gaps
  - Use Analytic Agenda for common threat scenarios
  - Ensure appropriate mission context to analyze system interdependencies to ensure mission completion
- Industry involvement in developing the range of technically feasible alternatives
  - Ensure industry understands the government context

These are pockets of best practices, but more work is needed.

Development Planning Analytics & Activities

DP ANALYTICS & ACTIVITIES	PRE-MDD	MDD to MILESTONE A
Advanced Technology Prototyping	Methods to assess technology feasibility	Technology prototype assessment
Affordability Analysis	Service budget portfolio analysis; program level less critical; ROM	Performance, cost, risk trades; vital; more precise
Architectural Considerations	Initial	More details
CONOPS / Concept Development	Brainstorm for concepts	Refinement; should have spec for contract
Cost Analysis	Start; ROM, lower fidelity	Refinement; more precise
Include "ilities" in everything (sustainability, reliability, survivability, maintainability)	Considered during concept feasibility assessment	Include with AoA
Interdependency Analysis (system integration assessment)	Initial	Refinement
Market Research	Leverage work from previous studies	Refinement; should have spec for contract
Mission Analysis (Capability Needs & Gaps)	Initial	Refinement
Performance Analysis	Initial	Refinement
Red Team Assessments	Start; early & often; Navy model of "gates"	Continue
Risk Analysis	Initial	Refinement
Schedule Analysis	Initial	Refinement
Solution Capability vs. Operational Gap	MOEs and initial MOPs	Refine MOEs; focused MOPs
Stakeholder Analysis	Initial	Refinement
Technology Gap Assessment	CBA	Refinement
Technology Readiness Level Assessment	Initial review	More details
Tradeoff Analysis	Start (FSA)	More details (AoA)
Operational Gap Analysis	CBA	
Wargaming Activities	Capability gaps developed	

Development Planning Gaps # 1

Analytics

- Affordability analyses and processes
- Tools & analytics for initial concept evaluation, e.g., Quality Functional Deployment (QFD) analyses
  - Parametric tools to scope down concepts, not detailed analyses
- Traceability of data and decisions throughout DP
- Reference architectures (at both Joint & Service Levels)
- Operational suitability, i.e., communications, intelligence, logistics, etc.
- Early manufacturing and reliability analysis to support MS A
- Non-materiel analyses and process
- Clear problem statements with baselines

Development Planning Gaps # 2

Organization and Teams

- Organizational impediments to analytic support for DP
  - Cross-functional teams need to better integrate operations analysts, systems engineers, testers, etc.
  - Translating broad user capability needs to candidate solution sets for acquisition community
- Appropriate resources for initial concept evaluation
  - People with the “right” skill set and experience, i.e., mission level analysis, system level thinking, decision analysis, facilitation, etc.
  - Allocated funding
  - Scheduling time to do prerequisite work, i.e., CBA, AoA, etc.

Development Planning Gaps # 3

Industry

- Lack of operational context for Concept RFIs
- Limited early involvement

Concepts

- Lack of “Achilles Heel” Analysis
- Insufficient Red Teaming potential concepts
- Insufficient consideration of flexibility, adaptability, resiliency

Development Planning Recommendations # 1

- Continue maturing Development Planning through DoD and Industry DP Working Groups
  - Including knowledge sharing, best practices, and lessons learned
- Expand and institutionalize cross-functional teams
  - User, acquisition, resource, requirements, operations analysts, testers, programmers, etc.
- Develop and formalize affordability analysis processes for DP
  - Recognize the difference between cost & affordability analyses
  - Affordability analysis should include mission-based, portfolio-based, and capability-based analyses
- Develop list of tools, techniques and processes for each of the DP Analytics and Activities (in the spreadsheet)

Development Planning Recommendations # 2

- Develop and institutionalize a “Red Team” process
  - Establish the analysis scope for the “Red Team” to consider
  - When assessing solution feasibility, conduct the “Achilles Heel” analyses
    - What vulnerabilities does it introduce?
    - What other gaps are created?
    - What gaps are not covered?
  - Establish a peer review process
- Allocate adequate resources for DP, i.e., right people, tools, data, time, funding, etc. (currently not consistently implemented across DoD)
- Develop a method to ensure manufacturing and reliability analyses early in concept refinement
- Develop and share a list of best practices and techniques for conducting “system level” trade space analyses

Development Planning Summary

- Department has made progress emphasizing Development Planning analytics, but more work is needed.
- There are pockets of good practices, but not institutionalized throughout DoD
- Services have placed more emphasis on the pre-MDD and MSA phase analytics
- DoD and Industry DP Working Groups established to define sufficiency of evidence requirements and to improve DP implementation