Leveraging Model Based Engineering for Test Planning

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Topics Covered

• What is Model-based Engineering
• Relationships Within Model Useful to T&E
• Assessing “Capability” Using Models
• Planning for Requirements to Test Cases
• Modeling Risk within Test Plan
• Tracing Governance Requirements
• Identifying the Need for Enabling Products
An approach to engineering that uses models as an integral part of the technical baseline that includes the requirements, analysis, design, implementation, and verification of a capability, system, and/or product throughout the acquisition life cycle.

1 Final Report of the Model Based Engineering (MBE) Subcommittee, 10 February 2011, National Defense Industries Association

This paper focuses on one aspect of MBE for an end product – evaluating “Capability”
Capability

Measure of the ability of an entity (department, organization, person, system) to achieve its objectives, specially in relation to its overall mission.

2 Source: http://www.businessdictionary.com/definition/capability.html

T&E Must Not Neglect Evaluation of Capability Proving Capability Enables T&E to Meet The Pace Of Need
User Needs are Modeled to Drive the End Product Design
One of Many DoD Raf Views With Useful Information to T&E

Source: http://dodcio.defense.gov/portals/0/Images/dodaf20/Figure10.jpg
Test Information within the DoDAF Capability View

 Often Overlooked by the T&E Professional
Measurements

Capability Need

Mission Tasks

Other Attributes

Utility to Users

KPP

KSA

CTP

MOE/MOP

MOE/MOS

COI

MOP(s)

MOS(s)

key performance parameter

key system attribute

measure of effectiveness / measure of performance

critical technical parameters

critical operational issue

Verification and Validation Activities

Capabilities Lead to MOP/MOS Evaluated by T&E

derived from DAU SYS101
An Architecture Model
An Architecture Model Links System With Operational Elements
Test Model from Product Model

From Your MBE Tool of Choice, Plan Tests Using Product Design Elements
Defining Test Activities

Requirements Analysis Yields Test Activities
Combined Product & Test Model

Unified Integration Test & Evaluation Model

Based on DoDAF 2.0 CORE9 Schema
Conclusion

Test Model Unified Within Product Model Enables

- Matching hardware & software capabilities and resulting test item configuration to milestones
- Configuration of enabling products
  - e.g., laboratory simulations and emulators; special test equipment; and instrumentation
- Rapid Assessment of Change Requests Impact
- Generation of Test Plan or updated sections

Enables T&E to Keep Pace With Need
THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN