Analysis of Alternatives in System Capability Satisficing for Effective Acquisition

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Analysis of Alternatives in System Capability Satisficing for Effective Acquisition

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Maturity

Physical

System Maturity

Logical

Indicates how a system responds to the circumstances or environment in an appropriate and adaptive manner.

This response is designed (in some instances learned) and not determined by the system's age.

Encompasses being aware of the correct time and place to deploy and knowing when to operate appropriately according to the situation.

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Systems Evolution and Lifecycle Management

Value Proposition:

- To provide a system-level view of development maturity with opportunities to drill down to element-level contributions
- To allow managers to evaluate system development in real-time and take proactive measures
- To create highly adaptive methods, processes, and tools to use on a wide array of system engineering development efforts
Trade Between Advanced Capability or Increased Maturity

Example provided by Northrop Grumman in support of the US Navy PMS 420 Program
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System Maturity is Enhanced

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Multi-Function, Multi-Capability (MFMC) System Development
A simple MFMC system—the Swiss Army Knife

Same function, different capabilities

Different functions

Large blade: cut

Small blade: cut

Bottle opener: open bottles

Simplified System Architecture

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Example- apply it to the Swiss Army Knife (TRLs and IRLs are notional)

Date: 1/20/2011
Expected SRL: 0.55

System SRL: 0.64
  Function- Cutting: 0.84
    Capability-Small Blade: 0.84
    Capability-Large Blade: 0.46
  ITRL-Knife Body: 0.54
  ITRL-Large Blade: 0.42
Function- Bottle Opening: 0.60
Capability-Bottle Open: 0.60

SRL

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Applying Component Importance Measures

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Evaluation Criteria: MATURITY

Evaluation Method via MFMC

Capabilities Optimization Model, Index of Capability Satisficing (FUTURE)

Input: Architecture Design and Synthesis

Alternatives Analysis and Evaluation

Output: Preferred System Architecture

Importance Measures: Lifecycle Cost, Schedule, Key Performance Parameters
Special Thanks

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- Northrop Grumman, Lockheed Martin, U.S. Army RDECOM, U.S. Army ARDEC