

A Comparative Analysis of Advanced Methodologies to  
Improve the Acquisition of Information  
Technology

By

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# Study Focus and Purpose

- Acquisition Lifecycle: Aligning process analysis and management tools to improve efficiency and effectiveness
- Methodologies:
  - EVM
  - Lean Six Sigma
  - Knowledge Value Added
  - Balanced Score Card
  - Integrated Risk Management
- Recommendations

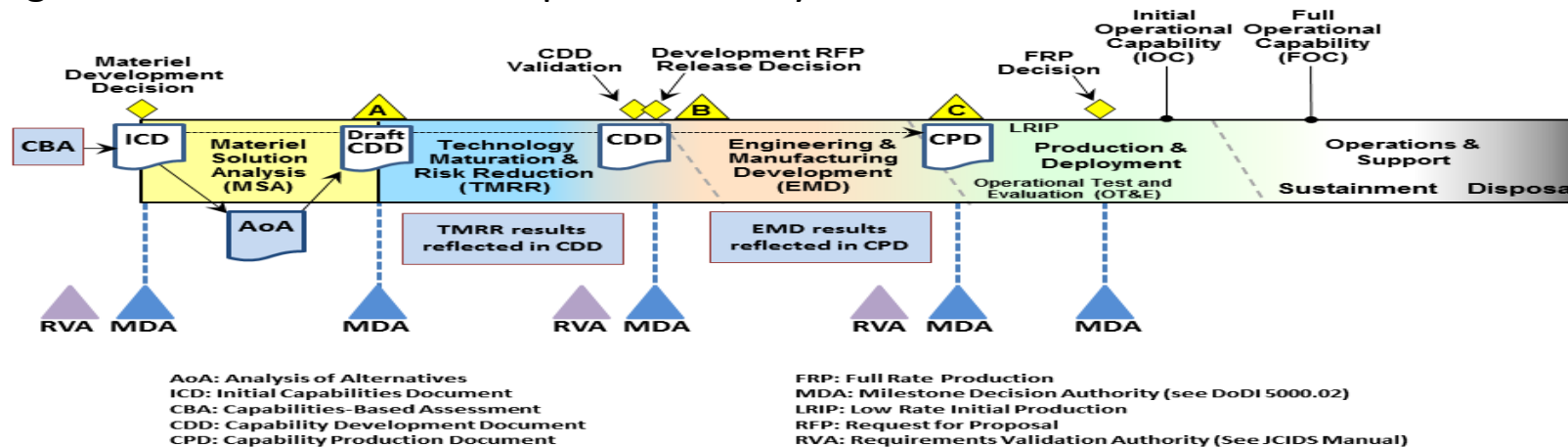
# Research Problem and Question

- IT acquisitions are fraught with cost overruns and schedule delays
- Are the process management and control tools, to support IT acquisitions, properly aligned to the lifecycle?

# Table 3. Key events within phases of the 5000 series

MSA	TMRR	EMD	P&D	O&S
Analysis of Alternatives	Preliminary Design Review	Complete detailed design	Low rate initial production	Lifecycle Sustainment Plan (LCSP)
Initial funding estimates	Capability Development Document	System-level Critical Design Review (CDR)	Initial Operational Test & Evaluation (IOT&E)	System Modifications
Technology Development Strategy	Competitive prototyping	Establish project baseline with Performance Measurement Baseline (PMB)	Full rate production decision	Sustainment
	Acquisition Program Baseline (APB) established		Initial and Full Operational Capability (IOC and FOC)	Disposal

## Figure 1. The 5000 Series Acquisition Lifecycle



Taken from Defense Acquisition Guidebook, 2017

Table 1. Five Approaches: When to apply in the Tech Investment Lifecycle

Pre-Investment	Strategic Goal Alignment	Implementation	Post Implementation
KVA (As-Is)	BSC (Align strategy with performance metrics)	EVM (Monitor cost and schedule, adjust as needed)	KVA (Monitor ROI, ROK)
L6 (Id waste, value added)	IRM (Identify the strategic options for IT investments)	KVA (To-Be, ROI, ROK)	L6 ( Assess and monitor cost, waste reduction)
Other	Other	IRM (Use the project management tools within the IRM suite)	Other

Table 2. Aligning the Generic and 5000 series lifecycles

Pre-Materiel Solutions Analysis	Materiel Solutions Analysis	Technology Maturation and Risk Reduction	Engineering and Manufacturing Development	Production and Development	Operations and Support
-Strategic goal alignment -Pre-investment	Pre-Investment	Pre-investment	Implementation	Implementation	Post-implementation

Table 4. : Combined Map of Both Table 1 and Table 2 to Show How the Five Methodologies Might Be Used in the 5000 Series Phases

Materiel Solutions Analysis	Technology Maturation and Risk Reduction	Engineering and Manufacturing Development	Production and Development	Operations and Support
BSC	IRM	EVM	EVM	KVA
IRM	KVA	IRM	IRM	L6σ
KVA	L6σ	KVA	KVA	
L6σ				

Table 6. Benefits and Challenges of the Five Methodologies

	Extensible, quantitative value measurement	Time to Perform	Cost	Bottleneck Analysis
BSC	No, subjective measurement (revenue is exception)	3-6 months (depends on level of analysis)	Accounting based financial metrics only	None
EVM	No, cost measurement only	5+ months set up time (depends on requirements)	Cost of resources and time	No, linear tracking only
L6σ	No, nominal value only	3+ months (depends on level of process complexity)	Activity Based Costing approach	Direct bottleneck analysis
KVA	Yes	2 days – 1 month (depends on level of analysis)	Common units of cost	Elapsed time versus work time
IRM	Yes, KVA	3-6 months (Relatively quick once initial steps completed)	Cost accounting and KVA cost metrics	Monte Carlo simulation

Table 5. Management Tool Selection Criteria Based Upon Level of Analysis, Focus of Analysis, Acquisition Phase

Level of Analysis	Focus of Analysis	Acquisition Phase
Organization	-Strategic competitive advantages: BSC, IRM -Value=Revenue: BSC, IRM strategic options	MSA/TMRR/P&D/O&S
Business Process	-Cost savings: L6 $\sigma$ , EVM, BSC, IRM -Schedule: EVM Value: KVA outputs	MSA/TMRR/P&D/O&S
Task Analysis	-Cost savings: L6 $\sigma$ , IRM -Value=Cost+schedule cycle time: L6 $\sigma$ , BSC	TMRR/EMD/P&D