Observations on the DoD Software Sustainment Challenge

DoD Maintenance Symposium

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November 12, 2012
Software and DoD

- Mission capability embodied in **software**...a unique source of strategic, military advantage
- DoD’s ability to *produce and evolve software* at core of achieving and, sustaining mission superiority, agility
- **Software**...essential to vast range of military system capabilities, operations... deepening and broadening role [NRC Critical Code, 2010]
- Many aspects of **cyber security** closely linked with software capability
- Creates software-dominated system imperatives
DoD Software-Dominated System Imperatives

- Acquire & evolve software dominated, interdependent systems (SoS) operating in a complex net-centric, cyber environment to achieve mission success continuously throughout systems’ life cycles
- Systems span Bus IT, C4ISR, Platforms, Networks, Enterprise
- Create technical & program management capabilities & capacities to affordably acquire & evolve those systems for their life cycles
- Plan & execute in a dynamic policy, governance, advancing technology, & $$$ constrained environment for life cycle program success

In this environment, all systems are information nodes.
Increasing, unrecognized bow wave of demands (unknown inventory size, composition, complexity, characteristics, *technical debt**)  
Not a physics of failure domain…demand/$ do not scale by optempo, force structure size  
About continuous software engineering  
• **Evolution** of capability; SoS/net-centric/cyber  
• Nature of SW at odds with SW Mx paradigm  
• Limited acquisition value placed on software architecture as upfront/life cycle trade space decision  
Complex technical infrastructure*** demands constant modernization $  
Nests in unaffordable O&S trends; limits investments; unrealized opportunities to achieve value from DoD SWS portfolio strategy  
Enterprise challenge, demands enterprise strategy

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* Software demographics  
** Technical debt - a metaphor referring to the eventual consequences of poor or evolving software architecture & software development  
*** Workforce, knowledge, practice, tools, Systems Integration Lab/test environment

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Software Sustainment (SWS) – Bottom Line

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SWS Challenge Framework

- Key Domains
- Strategy
  - Enterprise
  - Component
  - Program
- Priorities
- Stakeholders
- Governance
SWS Sustainment Study Needs
Some Essential Examples

Required software sustainment body of knowledge tailored for DoD needs

- Assess DoD SWS ecosystem infrastructure to identify gaps vs future needs
- SW portfolio inventory & demographics for decision making
- SW architecture R&D
  - Sustainment architecture ‘heuristics’ to analyze the portfolio
  - Advanced architecture practices for modernization thru sustainment
  - Sustainable architecture attributes to guide acquisition practices
- SWS workforce competencies, tools, practices
- Legacy reverse engineering environments
- Automated testing methods & tools
- Leverage SW portfolio strategies for economies of scale
- Software LCC cost analysis techniques for emerging technologies
- Practical SWS performance measurement
- Case studies building business case for data rights & licensing
Summary

- While new acquisition start pace will slow, impact of legacy + new legacy functionality + new systems in pipeline creates SWS tsunami
- SWS not an individual program stove-pipe issue/decision
- Current SWS infrastructure presents opportunities to leverage $ and productivity creating greater value
- Essential to shift to proactive and holistic 21st century, corporate SWS paradigm
- Create & execute corporate strategy, policy, and integrated, resourced approach to enable timely, informed senior level decision making
For More Information

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