

Practical Software and Systems Measurement

Objective Information for Decision Makers



Software Sustainment Estimation and Measurement Workshop

***Cheryl Jones - U.S. Army ARDEC
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Background

- ***The defense economic environment has placed a renewed emphasis on software maintenance and sustainment efforts***
 - ***The Army, Air Force, Navy, and OSD each have established collaborative initiatives to characterize and objectively define the activities and economics associated with software sustainment***
 - ***These initiatives are currently in the data collection and analysis phase - both government and industry is participating***
 - ***There exists a wide scope of software sustainment information requirements and user perspectives - the technical and management environments are diverse***
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Key Questions

- ***How can DoD best sustain its software portfolio?***
 - ***How much software do we need to maintain?***
 - ***How do we characterize the software sustainment environment?***
 - ***What level of resources is required to sustain operational software assets?***
 - ***How do we estimate the costs at both the project and enterprise levels?***
 - ***How should budgets be allocated?***
 - ***How should we align policy, processes, and resources?***
 - ***How do we measure software sustainment performance?***
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Software Sustaining Engineering - Maintenance

- ***Is more complex than development***
 - ***Diversity of activities - tasks***
 - ***Complexity of budgets - funding streams***
 - ***Intensity and amount of technical and management change***
 - ***Business and technical process differences***
 - ***Expectations compared to reality***
 - ***Is higher risk than development***
 - ***Immediate effects - direct user involvement***
 - ***Shorter time frame to take action***
 - ***Larger consequences - wider user impact***
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Workshop Objectives

- ***Build on the results of the current DoD initiatives and the 2009 and 2010 PSM Conference Workshops***
 - ***Review the current software sustainment environment - address expected changes - identify key information requirements***
 - ***Identify the data and information required at both the project and enterprise levels to align software sustainment policy, processes, and budgets***
 - ***Collaboratively involve experienced software sustainment professionals in the collection and analysis of the data and in shaping the path ahead***
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Workshop Agenda

- ***Review current DoD software sustainment initiatives***
 - ***Characterize the current and projected software sustainment environments:***
 - ***Development and sustainment distinctions - activities***
 - ***Business and technical processes - infrastructure***
 - ***Objectives, policy, and expectations***
 - ***Software sustainment information needs, architecture, measures, data, estimation***
 - ***Data availability - alignment with requirements***
 - ***Data integrity - adequacy to meet objectives***
 - ***Data collection - participation models - government and industry***
 - ***Estimation and analysis - measuring for sustainment***
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Projected Output

- ***More definitive characterization of the software sustainment environment***
 - ***Has anything been left out?***
 - ***Refined set of software sustainment information requirements***
 - ***What information is needed to make sustaining engineering resource allocation decisions?***
 - ***What information is available today?***
 - ***What is the information gap?***
 - ***Action plan and participation for data collection and analysis***
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Workshop Discussion

Current Software Sustainment Initiatives

- ***Review current DoD software sustainment initiatives***
 - ***OSD AT&L***
 - ***U.S. Army***
 - ***U.S. Air Force***
 - ***U.S. Navy***
 - ***OSD AT&L***
 - ***Software sustainment portfolio characterization - enterprise information requirements***
 - ***Future implications of maintaining the current software portfolio***
 - ***Investment requirements - policy and guidance alignment***
 - ***Complexity of the current (and projected) environments***
 - ***Services***
 - ***Measuring the software sustainment base***
 - ***Estimating software sustainment costs***
 - ***Data collection efforts - characterizing the inputs***
 - ***Development of CERs - Developing/Calibrating estimation models***
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Operational Software Support Tasks

- ***Software Maintenance***
 - ***The process of keeping a software product current after delivery***
 - ***Address new functionality***
 - ***Corrections to identified problems***
 - ***Support facilities and infrastructure***
 - ***Software Sustaining Engineering***
 - ***The continuing engineering and technical support needed to sustain maintenance operations***
 - ***User training and support***
 - ***Facilities and infrastructure update***
 - ***CM, Quality Assurance, Security, etc.***
 - ***Software Development***
 - ***Acquisition Management***
 - ***IV&V***
 - ***Software and systems testing is the largest portion of the work***
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Software Sustainment Environment Topics

- ***Adequacy of resources & budgeting mechanisms to support workload ?***
 - ***Changing nature of sustainment tasking?***
 - ***Changing nature of sustainment workload, e.g., security?***
 - ***Perceptions/biases of what environment looks like?***
 - ***Control/source of sustainment tasking, especially in SoS environment?***
 - ***Adequacy of business & technical infrastructure including process norms?***
 - ***Transition of information, products & processes from development to maintenance & sustainment?***
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Software Sustainment Data Topics

- ***Environment - product categorization?***
 - ***Data availability, collection & correlation?***
 - ***Definition of Scope/Baseline?***
 - ***Resource data against activities or products?***
 - ***Measures of output - product - backlog?***
 - ***Measures of performance? Analysis Models?***
 - ***Data rights?***
 - ***Time factor?***
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Workshop Participants

Joanne Arias - U.S. Army

Don Beckett - QSM

Bob Charette - ITABHI

Joe Dean - AFCAA

Mike Denny - DAU

Bob Epps - Lockheed Martin

Lee Harter - DOD

Cheryl Jones - U.S. Army

Jack McGarry - U.S. Army

Jeramia Poland - ODASA-CE

Susan Rauseo - Raytheon

John Sautter - Northrop Grumman

Jim Stubbe - Raytheon

Denton Tarbet - Galorath

Wade Wathen - Tecolote

Workshop Results

- ***There are minimal estimation assets available that address the identified complexity of software sustainment tasks***
 - ***Complexity factors:***
 - ***Assumptions and definitions***
 - ***Organization and product definitization***
 - ***Software change/workload dynamics***
 - ***Intensity/Intrusiveness of constraints***
 - ***Scope and variability of tasking***
 - ***Level of effort management processes and tools***
 - ***Development transition impacts***
 - ***Data rights***
 - ***Domain drivers***
 - ***Expected governance***
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Workshop Results

- **Prospective information needs - areas to address:**
 - **Software transition liabilities - residual risk (bills that are due)**
 - **Program affordability**
 - **Time defined product content**
 - **Maintenance - Product change “equivalent size measure” - contributing factors**
 - **Minimal acceptable functionality**
 - **Change necessity/priority**
 - **Release allocation - characteristics**
 - **Interface profile**
 - **Etc.**
 - **Data sharing - initiative participation**
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