

Practical Software and Systems Measurement

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A foundation for objective project management



***Measures for COTS-
Based Systems
PSM Users Group Conference***

***Department of Defense
U.S. Army***



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Objectives of the Workshop

- ***Review relevant work (USC and SEI) and discuss COTS-related life cycle activities***
- ***Identify COTS-specific measures for the ICM framework***



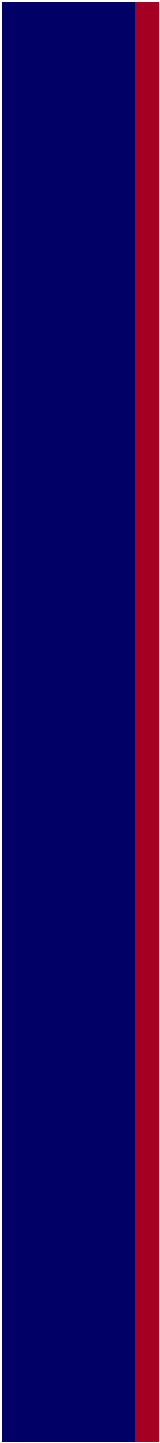
Practical Software and Systems Measurement Workshop Format

- ***Overview of COCOTS work sponsored by FAA***
- ***Overview of SEI COTS Initiative***
- ***Description of COTS activities and lessons learned***
- ***Discussion of COTS measures***

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Workshop Background

- ***PSM covers measures for custom developments.***
- ***Some measures (e.g., SLOC) are not relevant for COTS.***
- ***We reviewed current PSM measures to determine which measures are or are not relevant.***
- ***We built on the ICM framework in suggesting COTS-specific measures***



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Intended Output

- ***Recommended additions to ICM table***
- ***Issues captured***

Practical Software and Systems Measurement Workshop Participants

- | | |
|-------------------------|---------------------------------|
| – Guy Bois | LMCO Canada |
| – Ben Breaux | Robbins-Gioia/DLA |
| – Eneida Breaux | NAVSEASYS COM |
| – Bill Brykczynski | IDA |
| – Betsy Clark (co-lead) | Software Metrics, Inc. |
| – Brad Clark (co-lead) | Software Metrics, Inc. |
| – Tom Coonce | OSD/PA&E |
| – Joe Dean | Tecolote Research, Inc. |
| – Harpal Dhama | MITRE |
| – Khaled El Emam | NCR |
| – Rick Halcomb | NAVAIR |
| – Ron Kohl | AverStar, Inc. |
| – Beth McCall | CSC |
| – Garry Roedler | Lockheed Martin |
| – Virginia Thompson | US Army Space & Missile Def CMD |

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Summary: New measures are typed in blue

Issues – Categories – Measures Mapping		
Issue	Category	Measures
Schedule and Progress	Milestone Performance	Milestone Dates <i>Amount of time spent on assessment</i> Critical Path Performance
	Work Unit Progress	Requirement Status Problem Report Status Review Status Change Request Status Component Status Test Status Action Item Status
	Incremental Capability	Increment Content - Component Increment Content - Functionality

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Summary

Resources and Cost	Personnel	Effort Amount of effort spent on assessment Amount of effort spent on business process re-engineering Staff Experience (in the application domain, COTS integration, the specific product(s), the integrating products) Staff Turnover
	Financial Performance	Earned Value Initial Cost Recurring costs Training costs (tailoring training, user training, maintainer training.....)
	Environment and Support Resources	Resource Availability Resource Utilization

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Summary

Product Size and Stability	Physical Size and Stability	Database Size Amount of data to be converted Amount of code to do the conversion Amount of code to not be converted Number of COTS Components Number of COTS vendors Number of Interfaces that are interfacing with the COTS components Lines of Glue Code Number of Scripts Number of parameters initialized Number of GUI screens generated Number of user profiles Number of security levels Physical Dimensions
	Functional Size and Stability	Number of COTS capabilities not included in requirements Frequency of product release New release vs upgraded version Number of releases that project is behind Number of capability changes per release Functional Change Workload Function Points

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Summary

Process Performance	Process Compliance Process Efficiency Process Effectiveness	Reference Model Level Process Audit Findings Productivity Cycle Time Escapes Rework
Technology Effectiveness	Technology Suitability Impact Technology Volatility	Requirements Coverage by COTS products Number of requirements met by two or more COTS products (under consideration or in use) Vendor relationship (is it in the vendor's interest to have your project succeed?) Your contribution to vendor's current and future market share/bottom line Technology Impact Baseline Changes
Customer Satisfaction	Customer Feedback Customer Support	Survey Results Performance Rating Requests for Support Support Time

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Summary

Product Quality	Functional Correctness	Defects
		Technical Performance
	Supportability - Maintainability	Time to Restore
		Cyclomatic Complexity for Glue Code
	Efficiency	Product support
		Maintenance Actions
		Utilization
		Throughput
		Timing
	Portability	Standards Compliance
	Usability	Operator Errors
	Dependability-Reliability	Failures
		Fault Tolerance



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Next Steps/Action Items

- Suggested Follow-On Workshop
 - COTS impact to reference process capability models (e.g., SW-CMM, CMM-I)