

Practical Software and Systems Measurement

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A foundation for objective project management



***Systems Engineering
Cost Estimation
Workshop
PSM Users Group Conference***

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



Practical Software and Systems Measurement Systems Engineering Cost Estimation Workshop

- ***Discuss how to estimate Systems Engineering activities and tasks. The USC-CSE/Affiliates COSYSMO project and the Galorath project will be reviewed, and then issues related to systems engineering measurement will be discussed, prioritized, and addressed***

Workshop Background

- ***PSM history in this area***
 - ***Lack of SE Estimation in PSM when integrating systems engineering measures in to version 4***
 - ***Identification of Systems Estimation Cost modeling effort at USC***
- ***Where we're heading***
 - ***Track and participate in existing efforts***
 - ***Incorporate guidance as it matures***

Workshop Format

- ***Agenda***
 - ***Introductions***
 - ***Discuss, iterate objectives***
 - ***Review current initiatives***
 - ***USC-CSE/Affiliates COSYSMO project***
 - ***Galorath Project***
 - ***Others***
 - ***Discuss, prioritize, address issues***
 - ***Recommend PSM roles, initiatives***

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Workshop Participants (24 attendees)

Workshop Lead: Barry Boehm

- ***Cheryl Jones***
- ***Ruth Buys***
- ***Esteban Zuttion***
- ***Dana Van Orman***
- ***Guy Mercurio***
- ***Rick Eidson***
- ***Linda Leslie***
- ***Becky Grant***
- ***Bill Criss***
- ***Aaron Silver***
- ***Dennis Ahern***
- ***Garry Roedler***
- ***Joe Dean***
- ***Tom Davis***
- ***Bikshapathhi Adepu***
- ***Betsy Clark***
- ***Jack Ferguson***
- ***Bill Henry***
- ***Renee Schreiber***
- ***Chris Miller***
- ***Ander Marcotte***
- ***Carl Newman***
- ***David Magidson***
- ***Mia Hernandez***

Objectives of the Workshop

- ***Baseline current state of art, practice***
- ***Review current initiatives***
- ***Identify critical issues***
- ***Recommend PSM roles, initiatives***

Intended Output

The goals of the workshop:

- ***Address issues related to systems engineering estimation, and***
- ***Define candidate PSM roles and initiatives in the area***

Practical Software and Systems Measurement Issues for Discussion

- ***Estimation methods and models issues***
 - ***Alternative methods and models***
 - ***Relations to other estimates***
e.g., software engineering costs
 - ***Scope of “systems engineering”***
variation by domain
 - ***Data element definitions***
e.g., work breakdown structure
- ***Candidate PSM roles and initiatives***
 - ***Coordination of current initiatives***
 - ***Additional initiatives***
 - ***Additional methods and models***
 - ***Management usage guidelines***
 - ***Data collection and analysis guidelines***

Alternative methods and models

- ***Introductions revealed most systems engineering effort is done by analogy and activity based costing techniques***
- ***Attendees searching for help in the area of estimating systems engineering activities***
 - ***Validation of the need for a parametric model for systems engineering***

COSYSMO proposed approach

- ***Try “System Size” and effort drivers first***
- ***Draw on current sizing and drivers approaches***
 - ***Group and Raytheon driver assessments***
 - ***SAIC, Raytheon, TRW, Rational sizing approaches***
- ***Consider but defer activity-based and product-WBS based approaches***

COSYSMO Issues Encountered

- ***Scope: what's systems vs. software engineering***
- ***Special effort sources: modeling, COTS evaluation, documentation***
- ***Definitions of terms***
- ***Data collection and analysis***

Scope of SE and SWE

- ***Pure SWE***
 - ***SW Detailed design, code unit test, integration & test***
- ***Both SWE and SE***
 - ***IT (sub) system - level Ops Concept, Requirements, Architecture, Life Cycle Plans, Business Case, Test & Evaluation***
- ***Pure SE***
 - ***(IT + non IT) system - level Ops Concept, .., Test & Evaluation***
 - ***Facilities, deployment planning and engineering***

Restatement of Objectives

- ***Baseline current state of art, practice***
- ***Review current initiatives***
- ***Identify critical issues***
- ***Recommend PSM roles, initiatives***

Summary

- ***Multiple Systems Engineering Cost Estimation initiatives:***
 - ***COSYSMO, GMU, INCOSE, ...***
- ***COSYSMO project***
 - ***Sizing parameters and cost drivers are stabilizing***
 - ***Issues remain with respect to defining systems engineering***
- ***Further involvement from SE community needed***

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Conclusions, Recommendations, and Results

- ***PSM roles and initiatives***
 - *Independent review of model, parameter definitions, rating scales*
 - *Contribute data, iterate model*
 - *Coordinate progress via PSM, INCOSE meetings*
 - *Coordination of current initiatives*
 - *Identify Additional initiatives*

Additional methods and models

Management usage guidelines

Data collection and analysis guidelines

Next Steps/Action Items

- ***COSYSMO Affiliates Workshop at USC, August 9th 2001***
- ***Sixteenth International Forum on COCOMO and Software Cost Modeling (C/SCM 16), October 23-25, 2001. USC, Los Angeles, CA, USA***
- ***Establish ongoing collaborative relationships***
 - ***PSM: Data Collection, usage guidelines, ...***
 - ***INCOSE: Solicit SE expertise***