Practical Software and Systems Measurement

A foundation for objective project management

Measuring Systems Engineering Products

PSM Users Group Conference

Department of Defense
U.S. Army

July 2001

Measuring SE Products

- ***What additional PSM guidance is needed to address SE measurement of products?***

Objectives of the Workshop

- Develop ideas for additional guidance to address the issues identified in previous workshops on this topic
  - Identify practical ways to use PSM to define and apply MOEs, TPMs, MOPs and other measures specific to SE products
- Determine how to package up the ideas developed to date on the SE Product Measurement Case Study for further development in subsequent workshops

Workshop Format

- Agenda
  - Description of the problem area and the work we have done to date (1 hour)
  - Develop ideas to address specific issues that still need further discussion and development (2 hours)
  - Decide on how to transfer case study ideas to a new workshop team (15 minutes)
- Techniques that will be used
  - Brainstorming
  - Contributions of lessons learned
  - Open discussion

Workshop Background

- ***Where we've been***
  - ***1997 PSM Users Group Conference***
    - ***Decision to <u>consider</u> incorporation of SE measurement***
  - ***1998 INCOSE International Workshop***
    - ***Measurement Working Group (MWG) decision to support PSM, proposed integrated approach for guidance document***
  - ***1998 PSM Users Group Conference***
    - ***Decision <u>to incorporate</u> SE measurement in PSM***
  - ***1999 INCOSE International Workshop***
    - ***Agreement that SE measurement can generally follow existing PSM process***
    - ***Significant differences were visible in some measures***
  - ***1998 through 2000 PSM Writer's Group***
    - ***Developed initial SE-oriented content for PSM Version 4.0***
  - ***Conducted sessions of this workshop in July 2000, Jan 2001, Feb 2001***

Workshop Background

- Where we're heading
  - Wrap up the collection of ideas that will be developed to expand and clarify PSM guidance for SE measurement, particularly as it relates to product measurement
  - Transfer responsibility for development of SE Case Study to a future workshop
- Issues, questions, and topics
  - Ideas for new guidance on the use of TPMs, MOEs, MOPs, and other SE-specific measures

Intended Output

- ***List of ideas developed for new guidance material to be added to PSM regarding measurement of SE products***
- ***Decision on how to transfer ideas for SE Case Study to new workshop team***

Measuring SE Products

- ***What additional PSM guidance is needed to address SE measurement of products?***

Workshop Participants

- *Garry Roedler*
- *Ken Stranc*
- *Biksitapathi Adepu*
- *Greg Albert*
- *Bill Coberly*
- *Rick Eidson*
- *Mia Hernandez*
- *Chris Miller*
- *Renee Schreiber*
- *Bruce Stevens*

Restatement of Objectives

- ***Develop ideas for additional guidance to address the issues identified in previous workshops on this topic***
  - ***Identify practical ways to use PSM to define and apply MOEs, TPMs, MOPs and other measures specific to SE products***
- ***Determine how to package up the ideas developed to date on the SE Product Measurement Case Study for further development in subsequent workshops***

Summary

- ***Received validation and additional ideas on issues worked off in prior sessions***
- ***Developed many excellent ideas addressing 6 of the 9 outstanding issues***
- ***Decided to work off remaining issues through email discussions***
- ***Decided to carry on development of SE Case Study as a joint INCOSE-PSM project in future INCOSE and PSM workshops***

Conclusions, Recommendations, and Results

- Need to perform SE measurement after FOC through life-cycle since systems evolve
- Need to incorporate technical (SE) measures with schedule and resource measures when doing feasibility analysis
- Need to do an impact analysis of every requirement change on the SE measures
  - Use data from requirements tools as inputs to SE measurement

Conclusions, Recommendations, and Results (Cont.)

- ***For TPMs, establish confidence intervals around data points to quantify certainty of values when using combinations of estimated and actual data***
- ***When establishing MOEs***
  - ***identify factors that will influence variance***
  - ***identify relationships to key system attributes***
  - ***to create models to generate leading indicators***

Next Steps/Action Items

- ***Garry and Ken to write up results of this workshop in a paper that will serve as additional PSM guidance***
- ***Chris Miller and Betsy Clark will co-chair the INCOSE-PSM project to develop the SE Case Study showcasing the SE product measurement guidance developed in this workshop***