

COSYSMO 2.0 Reuse Workshop
June 23, 2009

Participants

Barry Boehm	USC
Garry Roedler	Lockheed Martin
Mike Ross	Tecolote
Gan Wang	BAE Systems
Mauricio Aguiar	TI Metrics
Akshat Mathur	MIT
Rick Cline	Boeing
Kevin Woodward	Lockheed Martin
Lori Saleski	BAE Systems
Alex Shernoff	BAE Systems
John Gaffney	Lockheed Martin
Ricardo Valerdi	MIT
Jared Fortune	USC

- COSYSMO 2.0 methodology supported
 - From a mathematical perspective, reuse can be accounted for in either the size or cost drivers, COSYSMO 2.0 accounts for reuse in the size drivers because: it is analogous to ESLOC, “reusability” can be addressed in Level of Service Requirement cost driver, and revising the size drivers has a more substantial effect than a single cost driver
 - Analysis of COSYSMO calibration data set determined a single reuse category is insufficient at capturing effect of reuse, supports approach of using multiple reuse categories; four and five reuse categories have been explored, identified need for better balance between simplicity and granularity
 - Six reuse categories (addition of “Design for Reuse” category) and their definitions confirmed as way forward
 - COSYSMO 2.0 provides a means of capturing reuse; however, regardless of having a model, reuse happens
- Reuse is generally strategic (product-line) or opportunistic (ad-hoc)
 - However, the actual benefits of reuse are frequently less than expected
 - Usually spend a significant amount of resources trying to find something to reuse, not always successful in finding
- Future COSYSMO research area: better, more consistent estimation of systems engineering size
- Reuse category Delphi exercise
 - Previous exercises identified weights of five reuse categories
 - Identified which EIA 632 activities would require additional effort to generate systems engineering products that are “Designed for Reuse”
 - Resulted in weights identified for all six reuse categories
- Reuse framework exercise

- The cost/benefit/risk assessment generally occurs at the same time, very early on in the process, will influence reuse strategy; need to support the business case upfront
- Decision is usually yes/no, not what category of artifact to reuse
- Process can be generalized to three major steps with a series of concurrent sub-steps
- All systems engineering products are (partially or fully) reusable
- Need to determine what reuse artifacts are available upfront
- Archiving artifacts for future reuse requires communication about what is available and validation that artifacts are actually being reused
- From an organizational perspective, an empowered product line manager is necessary
- Natural tendency to not reuse; organizational inertia against from “not invented here”, move away from reuse as soon as project schedule/cost slips (reuse discarded at first sign of trouble)
- Personnel is a major consideration
- Reuse of artifacts increases risk initially, but as artifacts are proven, risk decreases over time
- Reuse is often proposed with false assumptions and technical mismatches
- Reuse becomes extremely difficult as the scope changes
- Other intangible considerations: organizational culture, technical dependence
- May be different reuse category weights for opportunistic vs. planned reuse