COSYSMO
COstructive SYStems Engineering Cost MOdel

Working Group Meeting Out Brief

USC CSE Annual Research Review
March 18, 2003

Ricardo Valerdi

University of Southern California
Outline

• Brief overview of COSYSMO
• Workshop Goals
• Workshop participants
• Action items
• Calendar of upcoming activities
## Model Differences

<table>
<thead>
<tr>
<th>COCOMO II</th>
<th>COSYSIMO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Software</strong></td>
<td><strong>Systems Engineering</strong></td>
</tr>
<tr>
<td><strong>Development phases</strong></td>
<td><strong>Entire Life Cycle</strong></td>
</tr>
<tr>
<td><strong>20+ years old</strong></td>
<td><strong>2 years old</strong></td>
</tr>
<tr>
<td><strong>200+ calibration points</strong></td>
<td><strong>0 calibration points</strong></td>
</tr>
<tr>
<td><strong>23 Drivers</strong></td>
<td><strong>20 drivers</strong></td>
</tr>
<tr>
<td><strong>Variable granularity</strong></td>
<td><strong>Fixed granularity</strong></td>
</tr>
<tr>
<td><strong>3 anchor points</strong></td>
<td><strong>No anchor points</strong></td>
</tr>
<tr>
<td><strong>Size is driven by SLOC</strong></td>
<td><strong>Size is driven by requirements, I/F, etc</strong></td>
</tr>
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COSYSMO Operational Concept

- **Size Drivers**
  - Application factors
    - 8 factors
  - Team factors
    - 7 factors
  - Schedule driver

**Effort Multipliers**

- **Effort**
- **Duration**
- **Calibration**

- **Volatility Factor**

**# Requirements**
- # Interfaces
- # Scenarios
- # Algorithms

**WBS guided by ISO/IEC 15288**
4 Size Drivers

1. Number of System Requirements
2. Number of Major Interfaces
3. Number of Operational Scenarios
4. Number of Unique Algorithms

• Each weighted by complexity, volatility, and degree of reuse
15 Cost Drivers

Application Factors (8)
1. Requirements understanding
2. Architecture complexity
3. Level of service requirements
4. Migration complexity
5. Technology Risk
6. Technology Obsolescence
7. # and diversity of installations/platforms
8. # of recursive levels in the design
15 Cost Drivers (cont.)

Team Factors (7)
1. Stakeholder team cohesion
2. Personnel capability
3. Personnel experience/continuity
4. Process maturity
5. Multisite coordination
6. Formality of deliverables
7. Tool support
Workshop Goals

1) Perform quick Delphi for INCOSE Systems Engineering Center of Excellence 10%
2) Review action items from the last working group meeting (2/1/03) in Tampa 10%
3) Converge on driver definitions for Round 2 of the Delphi Survey 60%
4) Discuss COSYSMO data points 10%
5) Identify potential sources of data for the model 10%
Workshop Participants

Rosemary Hsu, Aerospace Corp.
Paul Mohlman, Aerospace Corp.
Karen Owens, Aerospace Corp.
Paul Stelling, Aerospace Corp.
Marilee Wheaton, Aerospace Corp.
Jim Cain, BAE Systems
Martha Spurlock, Defense Acquisition Univ.
Rob Flowe, Defense Acquisition Univ.
Evin Stump, Galorath
Garry Roedler, Lockheed Martin
Clate Stansbury, MCR

Steven Wong, Northrop Grumman
David Seaver, PRICE Systems
Michael Ernstoff, Raytheon
John Rieff, Raytheon
Gary Thomas, Raytheon
Chris Miller, Software Productivity Cons.
Larry Bernstein, Stevens Inst. of Tech.
Peter Hantos
Barry Boehm, USC
Ricardo Valerdi, USC
Action Items

1. Include definition of SE role in data collection form
2. Develop candidate list of anchor points
3. Develop data collection instrument
4. Schedule follow-up teleconference
5. Reconcile model with Ernstoff’s SE Products
Action Items (cont.)

6. Update drivers
   – Migration complexity
   – Personnel capability
   – Process maturity
   – Collaboration barriers
   – # of recursive levels in the design
   – Formality of deliverables

7. Perform Delphi Round 2
Calendar of Activities: 2003

- **USC CSE Annual Research Review**
  (Los Angeles, CA)

- **INCOSE 2003**
  (Washington, DC)

- **COCOMO Forum**
  (Los Angeles, CA)

- **INCOSE IW**
  (Tampa, FL)

- **Practical Software & Systems Measurement Workshop**
  (Keystone, CO)

- **Conference on Systems Integration**
  (Hoboken, NJ)

- **Working Group Meeting**
Thanks to the CSE Crew

LaDonna
Paul
Maggie
Crystal
Karim
Charmaine
Contact Information

Ricardo Valerdi
rvalerdi@sunset.usc.edu

Dr. Barry Boehm
boehm@sunset.usc.edu

Dr. Elliot Axelband
axelband@usc.edu

Don Reifer
dreifer@earthlink.net

Websites
http://sunset.usc.edu
http://valerdi.com/cosysmo