Unification Workshop
Out-Brief

19th Forum on COCOMO and Software Cost Modeling
Model Unification Tutorial
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Agenda
- Review discussion questions/issues
- Capture issues, concerns, desires
- Obtain initial survey results

Attendees (16)
- Aerospace
- USC CSE
- Sparta, Inc.
- US Army Tacom
- Lockheed Martin
- Boeing
- Disciplined SW Consulting
- ISCAS
- FAA
Models of Interest & Owners

- COCOMOII
- COCOTS
- COQUALMO
- COSYMO
- IDAVE
- CORADMO
- COSOSIMO
- COPSEMO

Legend:
Model has been calibrated with historical project data
Model is derived from calibrated models
Model has been calibrated with expert (Delphi) data

*includes Risk Analyzer, Monte Carlo, Security, Agile, and in-cremental versions
^includes Early version

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Unification Goals

- Allow more comprehensive cost exploration with respect to:
  - Development decisions
  - Investment decisions
  - Established project budget and schedules
  - Client negotiations and requested changes
  - Cost, schedule, performance, and functionality tradeoffs
  - Risk management decisions
  - Process improvement decisions

- Affiliate request: Provide a single unified tool to allow users to:
  - Specify system and software components comprising the software system of interest
  - Composition and characteristics of components
  - Receive a set of comprehensive outputs for system engineering, software development, and system-of-systems integration
  - Adjusted using the appropriate special-purpose extensions

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Discussion Questions from Initial Workshop

1. What does a unified model mean? Front end to specific system structure
2. Which models in the COCOMO suite should be included in the unified version?
3. What is the unified model development framework/vision?
4. How should the unified model evolve?
   - Top down approach, starting with a more comprehensive framework
   - Bottoms up approach, starting with the easier model(s)

5. When current models are used separately:
   - What is missed for the larger development effort?
   - What is double counted?
6. How are extensions treated? (or What framework constructs are needed to support extensions that may apply to only parts of effort to be estimated?)
7. How do we mix actuals and estimates together for incremental updates?
8. What is not included in these models?
9. How can we get something that we can easily validate?

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Main Issues

For each individual model as well as the unified model:
1. Objectives & Strategies
2. Inputs/scope of work
3. Output/scope of estimate
4. Assumptions of each model
5. Stakeholders for each model
6. Counting Rules
7. Sponsorship (FCS, Model-Based Acq.)
8. PSP dissertation critical mass
9. Data sources

Stakeholder Desires

- From Affiliates dinner
  - Start with COCOMO II, COCOTS, and COSYSMO
- Need to look at underlying life cycle models and synchronize
Options to Consider

- Diagrammatic approach for specifying components and relations between them
- Flow information into WBS
- Ability to calibrate distribution of hours across phases/activities
- Would be useful to get overlap/what's missing information out to users today
- Feedback loop (actual data) to support CMMI Level 3 process
- Ability to track history of parameters across project

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Options to Consider (continued)

- Capture assumption notes with respect to parameters
- Add a mechanism for user to add other cost elements to roll up into total
- Provide overview charts to use in high level management meetings
- Integrate with MS Project
- COCOMO extensions – look at supporting through WBS architecture

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Options to Consider

(continued)

- Create a worksheet with questions to help engineers specify parameters
- Longer term: feedback from COQUALMO based on actual defect removal
- Concept of underlying database, "out-of-box" reports, and ad hoc queries/reports
- Provide mechanism to automate "what if" scenarios for a range of cost/schedule parameters

Options to Consider for Technical Approach to Model

- Capture use cases for unified model from potential users
- Capture information on how users typically calibrate model today
- How much tailoring/customization will be allowed?
Survey Questions

- Types of software/system development projects
- Cost model priorities for unification
- Output requirements for unified model
- Additional comments/recommendation

Next Steps

1. Publish detailed minutes of workshop
2. Analyze survey results and distribute
3. Develop framework for the model
   a. Complete investigations in USC CS577a Fall 2004 project and analyze data collected
   b. Using results of workshop and CS577a project, develop framework and roadmap for achieving unification
4. Develop and track action items for future work
   a. Provide roadmap for unification initial efforts at next workshop
   b. Identify longer term features to be incorporated
5. Conduct follow-up workshop at Annual Research Review