Software Cost Estimation with COCOMO II: An Overview of the Book

Barry Boehm, USC
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Boehm@sunset.usc.edu
http://sunset.usc.edu

Affiliates' Summary

- Book rollout June 2000 at ICSE 2000
  - Content available on Affiliates-only Web site
- Free copies for Affiliate focal points, book reviewers
  - Looking for early-user testimonials
- Preparing for COCOMO II 2001 calibration
  - Will post on Affiliates-only Web site
  - Looking for data; electronic forms available soon
- Associates available for arranged-fee training courses
  - Abts, Bailey-Clark, Brown, Clark, Madachy, Reifer
- CD book-overview talk follows
  - With added information on CD contents
COCOMO II Book Content:  
Early Affiliate Availability

- Copies of Submitted Draft available through Affiliates Area
- Reproduction for internal use permitted upon request
- What you get: pdf files
  - Chapter draft text (double spaced) files
  - Chapter figures files
  - Chapter tables files

COCOMO II Book Table of Contents

Foreword - Walker Royce
1. Introduction
2. Model Definition
3. Application Examples
4. Calibration
5. Emerging Extensions
   - COTS Integration, Rapid Development,  
     Phase/Activity Distribution
6. Future Trends
Appendices*
   - Assumptions, Data Forms, User's Manual, CD Content
Purpose of COCOMO II

To help people reason about
the cost and schedule implications
of their software decisions

Major Decision Situations Helped by COCOMO II

- Software investment decisions
  - When to develop, reuse, or purchase
  - What legacy software to modify or phase out
- Setting project budgets and schedules
- Negotiating cost/schedule/performance tradeoffs
- Making software risk management decisions
- Making software improvement decisions
  - Reuse, tools, process maturity, outsourcing
Need to ReEngineer COCOMO 81

- New software processes
- New sizing phenomena
- New reuse phenomena
- Need to make decisions based on incomplete information

COCOMO II Model Stages

- Early Design (13 parameters)
- Post-Architecture (21 parameters)
- Concept of Operations
- Requirements
- Project Plan
- Detailed Design
- Acceptance
Early Design and Post-Architecture Models

- Effort = \[ \text{Environment Multipliers} \times \frac{\text{Size}}{\text{Process Scale Factors}} \]

Environment: Product, Platform, People, Project Factors
Site: Nonlinear reuse and volatility effects
Process: Constraint, Risk/Architecture, Team, Maturity Factors

- Schedule = (Multiplier) \times \text{Effort} \times \text{Process Scale Factors}

COCOMO II Estimation Accuracy:
Percentage of sample projects within 30% of actuals
- Without and with calibration to data source

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<th>COCOMO81</th>
<th>COCOMO II1997</th>
<th>COCOMOII2000</th>
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<td># Projects</td>
<td>63</td>
<td>83</td>
<td>161</td>
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<tr>
<td>Effort</td>
<td>81%</td>
<td>52%</td>
<td>75%</td>
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<tr>
<td>Schedule</td>
<td>65%</td>
<td>61%</td>
<td>72%</td>
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2/0000 100% 98% 92% 85% 80% 72% 70%
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CD Content

- Platform requirements
  - Windows 95 or higher (including NT 4.0)
  - Internet Explorer 4.0 or Netscape 3.0 -- or higher
  - Excel 5.0 or higher to use spreadsheet models
  - Acrobat Reader and Quick Time viewer provided on CD
- Top-level screen: CD use information, video overview, links to sub-menus
- USC COCOMO II.2000 self-install program
  - Requires 4MB plus 8MB temporary disk space for installation
  - Includes help/model definition files, Excel program to graph results
- Spreadsheet Models: COPSEMO, CORADMO, COPROMO
- Tutorials: Transaction Processing (Reifer); Airborne Radar (Madachy)
  - “My First COCOMO Run” user interactive tutorial
- Demo versions of commercial tools: COSTAR, Cost Xpert, Estimate-Professional
- Data collection forms
  - Enable closed-loop management use of COCOMO II
- Affiliates' information
Using COCOMO II to Cope With Change: I

System objectives: functionality, performance, quality

Project Parameters:
- Personnel, team, sites, platform

Corporate parameters:
- Tools, processes, muse

Rescope

Cost, Schedule, Risk

Yes

COCOMO II

Ok?

Using COCOMO II to Cope With Change: II

System objectives: functionality, performance, quality

Project Parameters:
- Personnel, team, sites, platform

Corporate parameters:
- Tools, processes, muse

Rescope

COCOMO II

Release milestones, plans, resources

End Project
Using COCOMO II to Cope With Change: III

System objectives:
1. Execute functionality
2. Cost, project performance, quality
3. Revised milestone expectations
4. Revised corporate plans, resources

COCOMO II:
1. Revise project to next milestone
2. Revise corporate parameters: tools, processes, reuse

Milestones:
1. Revised expectations
2. Revised milestones

End Project

Using COCOMO II to Cope With Change: IV

System objectives:
1. Execute functionality
2. Cost, project performance, quality

COCOMO II:
1. Revise project to next milestone
2. Revise corporate parameters: tools, processes, reuse

Milestones:
1. Revised expectations
2. Revised milestones

End Project

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