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SOUTHERN CALIFORNIA

COCOTS Status: Executive Overview

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**USC Center for Software Engineering
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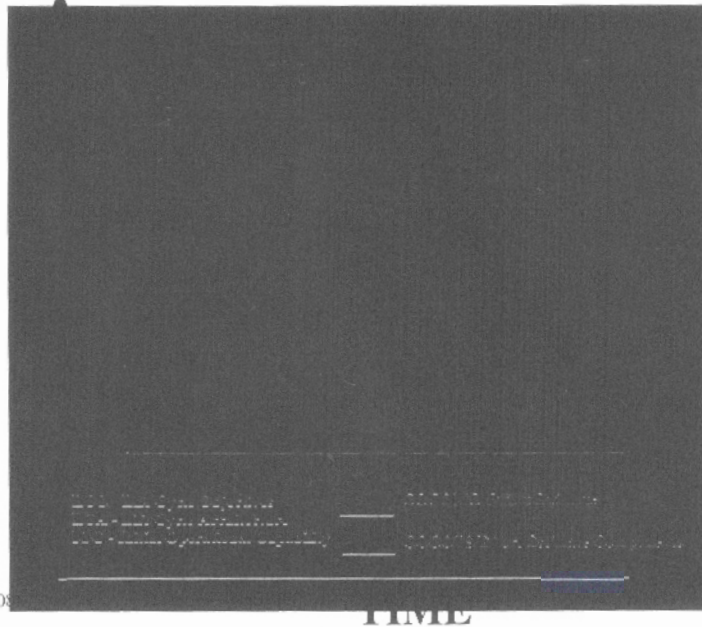


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Briefing Outline

- **COCOTS: What does it do?**
- Calibration Status
- Tools & Aids Availability
- Future Refinement

COCOMO vs. COCOTS Cost Sources



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Current Database

- 20 Industrial projects
- Data collection continuing
 - (COCOMO 81 debuted with 63 calibration data points)

Project Domains

(project sources: Army, Navy, FAA, CSE Affiliates)

- Air Traffic Management 8
- Business (including databases) 3
- Communication, Navigation, & Surveillance 4
- Logistics 1
- Mission Planning 1
- Operations 2
- Web-based Maps 1

Classes of COTS Products Represented

- configuration mgmt/build tools
- databases
- data conversion packages
- disk arrays
- compilers
- communication protocols/packages
- emulators
- engineering tools (reqs mgmt, design)
- software process tools
- GUIs/GUI builders
- graphic information systems
- middleware
- operating systems
- network managers
- device drivers
- problem mgmt
- report generators
- back office retail
- telecommunication & infrastructure
- telemetry analysis
- telemetry processing
- word processors

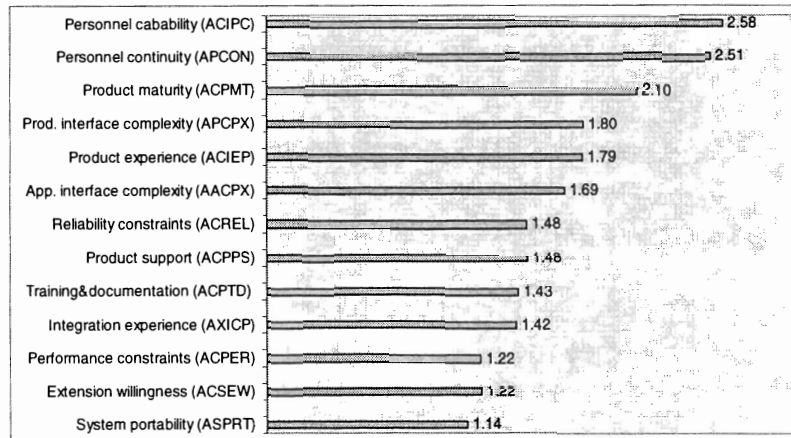
Average Effort & Schedule Across Submodels

A representative COTS product class: GUIs
(4 to 7 datapoints)

	<u>Assessment</u>	<u>Tailoring</u>	<u>Glue Code</u>
<u>Average</u>			
Effort (pers-months)	3.2	53.75	40.75
range	1 to 6	1 to 186	7 to 84
Schedule (months)	3.6	16.5	21.75
range	0 to 12	6 to 66	1 to 56



Glue Code Cost Drivers Productivity Ranges



Current Predictive Results: *Glue Code Effort*

At 13 pts, COCOTS glue code model within:
50% of actuals 62% of the time
33% of actuals 38% of the time
(with 1 parameter calibrated)

At 83 pts, USC COCOMO II.1997 within:
30% of actuals 52% of the time
(with 21 parameters calibrated)

Current Predictive Results: *Glue Code Schedule*

At 13 pts, COCOTS glue code model within:
31% of actuals 54% of the time
(with 1 parameter calibrated)

At 83 pts, USC COCOMO II.1997 within:
30% of actuals 61% of the time
(with 2 parameters calibrated)

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Tools & Estimation Aids

- COTS Assessment Profiles
 - full set (~9/1/00)
- COCOMO II-COCOTS spreadsheet tool
 - full implementation (~5/1/00)
- USC COCOMO II-COCOTS software
 - partial prototype available now/full implementation (?)

Assessment Submodel

*[Insert Assessment Profile
for Product Class: GUIs]*

USC COCOMO II-COCOTS Software

Image captured with HyperSnap-DX
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Scale Factor: _____ Schedule: _____
Development Model: COCOTS

GUI	S:15450	47	5.04	343.6	24.3	0.0
Data converter	S:5720	67	2.20	104.5	2.7	0.0

EAP GUI

Base + Incr % = rating

Personnel: ACIEP ACIEC ANCIIP APCON
 Base: VHI VLO LO VLO
 Incr: OI OI OI OI

COTS Component: ACNHT ACSEW APCPK ACFFS ACPTD
 base: NON VHI HI LO NON
 Incr: OI OI OI OI OI

Application: ACSEL AACPK ACPEP AEPST
 base: HI NON NON NON
 Incr: OI OI OI OI

EAP is also affected by
 EAP: 2.36

OK Cancel Help

Estimated	Effort	Sched	PMH	COST	INST	Staff	RISK
Optimistic	705.2	30.3	30.0	4725041.79	223.2	23.3	
Most Likely	881.5	32.6	24.0	5906327.24	279.0	27.1	0.0
Pessimistic	1101.9	36.0	19.2	7282909.01	348.7	31.3	

Total Lines of Code: 21170

Ready.

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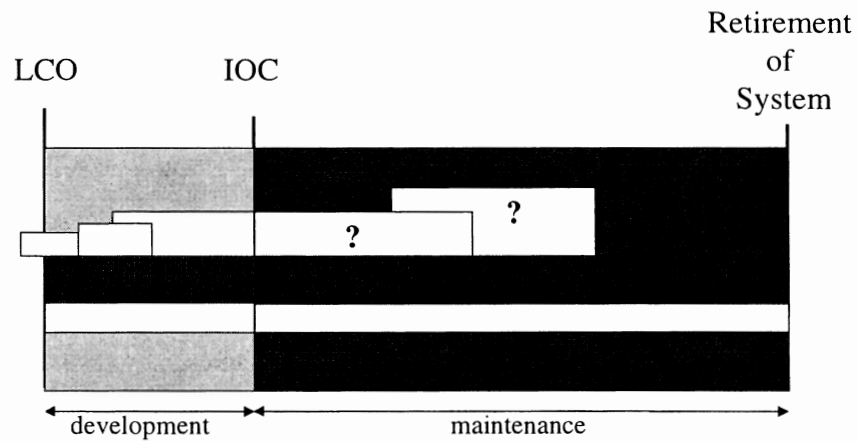
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Lifecycle COCOTS



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Further Data Collection & Calibration

- Expand survey to address maintenance/total life cycle
- 20 points in hand, goal of 20 more data points through the end of the year to raise total to 40
- 7 to 14 good data prospects already identified
- *Can you help provide anymore???*

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COTS Assessment Profile

Product Class: GUI

Attributes	unkwn	0	p-hr	p-day	p-wk	p-mt	3 p-mts	N p-yrs	weighted effort
correctness	U	1			1		2		.26 - .38pm
Availability/Robust	U	1		1	1		2		.41 - 1.26pm
Security	U	1	2	1	1				.01 - .06pm
Product Perfomanc	U				3		2		.43 - 1.35pm
Understandability	U	1		1	1		2		.06 - .10pm
Ease of Use	U		2	1	1	1			.06 - .26pm
Version Compatibi	U	1		1	1	1			.08 - .33pm
Intercomponent Cc	U			1			4		.20 - .81pm
Flexibility	U		2	2					.00 - .03pm

COTS Assessment Profile

Product Class: GUI

Attributes	unknwn	0	p-hr	p-day	p-wk	p-mt	3 p-mts	N p-yrs	weighted effort
Installation/Upgrad	U	EL	VL	L	N	H	VH	EH	.00 - .01pm
Portability	U	EL	VL	L	N	H	VH	EH	.01 - .07pm
Functionality	U	EL	VL	L	N	H	VH	EH	.73 - 2.62pm
Price	U	EL	VL	L	N	H	VH	EH	.13 - .30pm
Maturity	U	EL	VL	L	N	H	VH	EH	.02 - .10pm
Vendor Support	U	EL	VL	L	N	H	VH	EH	.14 - .13pm
Training	U	EL	VL	L	N	H	VH	EH	.11 - .27pm
Vendor Concessio	U	EL	VL	L	N	H	VH	EH	.00 - .03pm
Other1	U	EL	VL	L	N	H	VH	EH	

U: unknown L: 1 p-hr < e < 1 p-day VH: 1 p-mt < e < 3 p-mt
 EL: 0 effort (e) N: 1 p-day < e < 1 p-wk EH: 3 p-mt < e < N p-yrs (N =)
 VL: e <= 1 p-hr H: 1 p-wk < e < 1 p-mt

Total weighted effort: 2.66 - 8.30pm