Perspectives on Impact of Using COTS Software on Long-term System Costs

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Outline

• Definition of COTS Software
• COTS Development Costs (COCOTS model)
• COTS Operations & Maintenance Costs (COCOTS Extension)
• COTS Volatility Effects (COTS-LIMO meta-model)
• Conclusion
COTS Software Definition

• “Commercial Off the Shelf” Software
• Commercial Software Products
  – sold, leased, licensed at advertised prices
• Source Code Unavailable
  – generally an application program interface (API)
  – frequently tailoring options
• Usually periodic releases with feature growth, obsolescence
COCOMO vs. COCOTS Cost Sources
(COTS in System)

3) COTS/Application Glue Code Development and (System) Test

1) COTS Assessment
2) COTS Tailoring

Application Code Development
Integration and Test Separate from COTS Effects

4) Increased Application Effort due to COTS Volatility

LCO - Life Cycle Objectives
LCA - Life Cycle Architecture
IOC - Initial Operational Capability

COCOMO Effort Estimates
COCOTS Effort Estimates Components

TIME
Total Lifecycle COCOTS
Total Lifecycle COCOTS

Some suggested sources of COTS maintenance costs:

• Sources already in the development model

Plus

• Infrastructure
• Training
• Technical support
• Market watch/research
• Vendor investigation/vetting
• Licensing
• Others?

Fn (synchronization, complexity of system, no. planned upgrades, etc.)

Cost of maintenance

$\quad n+X\quad n+3\quad n+2\quad n+1\quad n\quad 5\quad 4\quad 3\quad 2\quad 1$

Volatility effects dominate increased integration experience

Increased integration experience dominates volatility effects

Volatility effects just cancel increased integration experience

Retire
Maintain

Time

10/12/1999
Conclusion

• Planning for COTS maintenance must be much more proactive than approach taken for maintenance of traditional s/w systems

• Testing for “unknown” (i.e. unanticipated interactions) bigger issue with COTS

• Maintenance can be mitigated by actions taken in development
  – e.g., decoupling COTS products as much as possible during development
  – e.g., establishing strong partnerships with COTS vendors during selection