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June 6, 1992

To: Kurt Fischer
From: Paul A. Strassmann
Subject: COCOMO is 95% Off

Enclosed is an interesting piece of information from Lockheed suggesting that CASE (and SEI Level 3 rating) allowed them to do 95% better than suggested by the COCOMO cost model which is widely used within DoD as a software estimating benchmark.

I would appreciate it if one of our software metrics people would look into this claim. I would also appreciate if the metrics task force recommend how this should be considered in any future evaluations of software cost estimates.

A handwritten signature in cursive script that reads "Paul". Below the signature is a long, thin horizontal line that tapers at both ends, resembling a pen stroke or a decorative underline.

cc: Mosemann, Browning, B.Boehm, Knecht, Erwin, B.Smith, D.Brown,
Mestrovich, Jeffcoat

Lockheed Missiles & Space Company, Inc.

Sunnyvale, California

DATE: June 2, 1992

SUBJECT: Action Item from Paul Strassmann-Sam Araki Visit

The Space Systems Division's Mission Management program is the first SSD development program to complete an entire Software Lifecycle using processes rated at the low end of SEI level 3 and an integrated Computed Aided Software Engineering environment. The SEI rating was obtained from a self assessment performed by the Corporate Software Process Task Force. The Lockheed Software Engineering Environment (LSEE), internally developed and initially released in 1987, was used as the CASE environment.

An internal productivity analysis was done to quantitatively compare the Mission Management development against what Barry Boehm's nominal COCOMO cost model would predict, and against the previous high productivity program within the Space Systems Division. The unit of measure was non-commented source code per hour. Included in the labor hour total were all direct and indirect hours for Program Management, Program Controls, System Engineering, Software Development, Integration and Test, and Quality Assurance over the life cycle. For both analyses, an apples to apples comparison by Work Breakdown Structure was performed.

The analysis shows that for the 662,890 non-commented source lines of code (1.3 million total lines of code), the Mission Management productivity was 95% greater than the nominal COCOMO cost model prediction, and 48% greater than the previous high productivity program within SSD. Additionally, with this latter comparison, we can calibrate out differences in the problem domain of the application and personnel variability. The resulting increase in productivity, we feel, is attributable to the processes and the integrated CASE environment employed on the program.

The 50% increase Sam Araki cited in the Paul Strassmann meeting is a result of this study and corresponding recommendation to bid new development efforts at 50% greater productivity than the COCOMO cost model.

I hope this clarifies the realized productivity gains Lockheed has experienced in using modern processes with integrated CASE tools.

Sincerely,


Thomas J. Taboada
Program Manager
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