Reuse: A Maturing Practice

CROSSTALK has been covering the many aspects of reuse since the early 1990s. Those aspects include publishing policies, initiatives, techniques, best practices, and lessons learned from those in the field who have been researching and practicing reuse. During this time, and as shown by this issue's full set of articles, reuse has become more widely accepted and continues to mature in the defense software community.

In the past, many teams often discarded reuse on their projects primarily because they had no foundation, strategy, or process to employ reuse. As a programmer, I remember many times wondering if I was caught in a *duplication-of-effort* trap. Was the code I was generating already developed and sitting in a library somewhere? Who do I ask? Where do I look? Much has changed, especially with reuse applications such as commercial off-the-shelf software, government off-the-shelf software, network-centric architectures, and open source software. With the Web and portal environments now at many programmers' fingertips, information on reusable components and artifacts has never been more available and accessible.

The management of projects employing reuse is also maturing. With managers' interests peaking in the cost of reuse, we begin this month's issue with *An Economic Analysis of Software Reuse*, by Dr. Randall W. Jensen. This article presents results from a simplified economic model that predicts software product development costs in an environment containing reused software components. Results from Jensen's analysis are independent of any software estimating tools or models. The specific reusable component types considered in the analysis include requirements, design, code, and validated code. Additional information on the cost of reuse is presented in *Estimating and Managing Project Scope for Maintenance and Reuse Projects* by William Roetzheim. This author discusses quantitative approaches to estimating scope and effort for maintenance, enhancement, and reuse projects.

Next, Dr. Kelvin Nilsen brings us *Using Java for Reusable Embedded Real-Time Component Libraries*. Nilsen discusses how Java has progressed and now supports mission-critical, real-time systems. With its portability features and its appeal to programmers, Java is helping to lay the foundation for a reusable software component industry. Nilsen also discusses how standards are being developed to help encourage competitive pricing and innovation among Java technology vendors while assuring portability and interoperability of real-time components.

Reuse is also discussed in our next article, *Separate Money Tubs Hurt Software Productivity* by Dr. Ronald J. Leach. This author shows how cost and quality improvements are rarely simultaneously achieved due to the common management and project accounting practice of *every tub on its bottom* where a *tub* of money is utilized solely for one project. The author suggests simple changes to funding approaches to help achieve key objectives of *more* software *better*, *cheaper*, and *faster*.

Our final article this month is *Reuse and DO-178B Certified Software: Beginning With Reuse Basics* by Hoyt Lougee. This article presents a good summary of reuse basics and discusses the less publicized safety benefits of reuse. In the DO-178B guidance, objectives and activities that must be performed in developing and verifying airborne software systems are defined. Adherence to DO-178B is causing many avionics manufacturers to turn to reuse. This article is informative for all readers interested in reuse even if you are not concerned with DO-178B.

As we put the wraps on our 17th volume, I hope you find this issue a good source of continuous learning on the subject of reuse. Don't forget to check out CROSSTALK's Volume 17 Article Index (see page 29) highlighting the many other subjects and articles published in 2004. And finally, I close by giving a special thanks to our readers, authors, and new co-sponsors: the United States Air Force's Air Logistics Centers and their three Software Divisions. Their sponsorship commitment is a great gift this season to all of us in the defense software community.

On behalf of the CROSSTALK staff, I wish you a safe and wonderful holiday season.

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Publisher