Winning Projects Exemplify Success for Developers and Acquirers

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The Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics and the CrossTalk *staff announce the 2003 U.S. Government's Top 5 Quality Software Projects. Again, this year's winners represent great success in delivering software to government acquirers.*

U.S. Government's Award-Winning Quality Software Projects

The results are in, and it is clear that the government is building many successful software packages that are top-notch examples in project management and quality control. Listed below in alphabetical order are the winners of the third annual U.S. Government's Top 5 Quality Software Projects contest managed by CrossTalk. We congratulate them and hope you enjoy reading more about their winning projects in the following pages.

- **Advanced Field Artillery Tactical Data System**
  Customer: U.S. Army/USMC/ U.S. Navy
  Developer: PM Intelligence and Effects and Raytheon Team
- **Defense Medical Logistics Standard Support**
  Customer: Military Health System
  Developer: DMLSS Program Office
- **H1E System Configuration Set**
  Customer: Program Manager Air, AIR-265
  Developer: F/A-18 Advanced Weapons Laboratory and Boeing IDS
- **OneSAF Objective System**
  Customer: Program Manager OneSAF Objective System – U.S. Army's Program Executive Office for Simulation, Training, and Instrumentation
  Developer: OneSAF Objective System Integrated Product Team
- **Patriot Excalibur**
  Customer: AFMC
  Developer: 46 TW/XPI (TYBRIN)

The Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics and the CrossTalk staff announce the 2003 U.S. Government's Top 5 Quality Software Projects. This year's winning projects continually impressed reviewers and judges through four rounds of scoring.

While reflecting on this year's winners, I found it interesting that over 40 percent of the scoring criteria focuses on how happy the customer is with the end product, and less than 20 percent focuses on the processes used to develop the software. However, again this year, the winning projects implement software development processes that involve peer reviews, configuration management, requirements management, and other practices suggested by ISO 9001 and various software maturity models.

Based on this, I decided to look for additional consistencies among the projects. Another interesting commonality I found in reviewing project information is the requirement for these projects to interface their software with other software. This was also a common theme in many of CrossTalk's January 2004 articles from senior military leadership: the requirement for software to be able to network together for information requirements. Many of this year's Top 5 winners do just that.

Customer support always impresses me. In the Advanced Field Artillery Tactical Data System (AFATDS), the Raytheon engineers provided support in the conflict zones in Iraq where the AFATDS was being used. The Patriot Excalibur developers provide in-house training at no charge and if the users want training at their location, they only need to fund the cost of the temporary duty.

Physically locating the developers with the customers and users during development also seemed to be a big help in the success of some of the winning projects.

Given the rate of software project failures and the current U.S. government focus on acquisition process improvement, I asked customers of these projects to provide some tips for acquisition success. Some pointers I received include the following:

- Institute an Alpha Contracting (AC) process, which places a heavy focus on requirements definition. All stakeholders (users representatives included) participate, ensuring adequate detail to the requirements to preclude misinterpretation during software development. This is done prior to contract award and also allows a more accurate sizing of the effort. AC also fosters an open communication that carries on through the development. The AC process jumpstarts the team.
- Consider using multiple development contractors to minimize the risk (impact of failure) if one of the developers fails.
- If possible, have the contractors physically collocated with the government team enabling daily communication.
- Consider facilitating collaboration with a Web-based collaborative development environment.
- Consider the spiral development methodology and an implementation of eXtreme Programming.
- Consider heavy use and participation in open source software.
- Utilize advanced software development processes such as the Capability Maturity Models®.
- Select a proven government/industry team with experience with the intended end-user operating environment.
- Develop detailed plans and agreed upon methods and metrics to measure progress, then work the plan. Whenever progress deviates from the plan, assemble the team to establish corrective actions, then track those actions to closure. It can be very rigorous and sometimes tedious but the result is worth it.

I would like to give special thanks to our final judges whose respect in the software community adds prestige to this award. I would also like to thank Mark Schaeffer, principal deputy, Defense Systems, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics for continued sponsorship of this award.◆

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Top 5 Quality Software Projects Judges' Biographies

David A. Cook, Ph.D., is a senior research scientist at The AEgis Technologies Group, Inc., working as a verification, validation, and accreditation agent in the modeling and simulations area. He is currently supporting the Airborne Laser program and has more than 30 years experience in software development and management. He was formerly an associate professor of Computer Science at the U.S. Air Force Academy, a deputy department head of the Software Professional Development Program at the Air Force Institute of Technology, and a consultant at the U.S. Air Force Software Technology Support Center. Cook has published numerous articles on software-related topics. He has a doctorate in computer science from Texas A&M University. <dcook@aegistg.com>

Carol A. Dekkers is president of Quality Plus Technologies, Inc., a management consulting firm specializing in creating peace of mind for companies who want to improve their software processes. Software measurement, software quality, process improvement, requirements, and software sizing (using function point analysis, as an example) are a few of the Quality Plus areas of specialization. Dekkers is also the chair of the American Testing Board, the U.S. participant in the International Software Testing Qualifications Board Certified Software Tester certification. She is a Certified Management Consultant, a Certified Function Point Specialist, and a professional engineer (Canada). She holds positions with the Project Management Institute, the American Society for Quality (ASQ), and the International Organization for Standardization's software engineering standards subcommittee. ASQ's Quality Progress named her one of 21 New Voices of Quality for the 21st Century. <dekkers@qualityplustech.com>

Jack Ferguson, Ph.D., is manager of the Appraisal Program at the Software Engineering Institute where he is responsible for the training, authorization, and quality of appraisers for the Capability Maturity Model® for Software (SW-CMM®) and CMM Integration℠ (CMMI℠) models who use the Capability Based Assessment for Process Improvement and the Standard Capability Appraisal Method for Process Improvement methods. Previously, Ferguson was director of Software Intensive Systems in the Office of the Secretary of Defense. Before that, he led the teams that developed the Software Acquisition CMM and the CMMI models. Ferguson has a doctorate in aerospace engineering and is listed in Jane's Who's Who in Aerospace for his work on Global Positioning System spacecraft control systems. <jrf@sei.cmu.edu>

Lt. Col. Ricky Sward, Ph.D., U.S. Air Force, is an associate professor of computer science at the U.S. Air Force Academy. He is currently the deputy head for the Department of Computer Science and the course director for the senior-level two-semester Software Engineering capstone course. Sward received his doctorate in computer engineering at the Air Force Institute of Technology in 1997 where he studied program slicing and reengineering of legacy code. <ricky.sward@usafa.af.mil>

Edward C. Thomas, director, U.S. Army Communications-Electronics Command leads efforts to provide state-of-the-art software engineering products and services throughout the U.S. Army and the Department of Defense. These products and services include enterprise-level software architecting and integration; software technology assessment and application; system-level software engineering for more than 400 individual Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance and business systems; and worldwide technical support to war fighting units. He leads a global organization of more than 3,000 military, civilian, and industry employees and manages an annual budget of approximately $300 million. Thomas has worked in various capacities for the Army since 1974 and was appointed to the Senior Executive Service in 2001. <edward.c.thomas@us.army.mil>

Richard Turner, D. Sc., is a research professor in engineering management and systems engineering at The George Washington University. In support of the U.S. Department of Defense, he supports the Systems Engineering Directorate of the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, Defense Systems organization in assessing software aspects of weapon systems programs, implementing software acquisition process improvement programs, and identifying and transitioning new software technology into defense systems. Turner is a co-author with Barry Boehm of "Balancing Agility and Discipline: A Guide for the Perplexed," and co-author with Dennis Ahern and Aaron Clouse of "CMMI® Distilled." He has a Bachelor of Arts in mathematics from Huntingdon College, a Master of Science in computer science from the University of Southwestern Louisiana, and a Doctor of Science in engineering management from The George Washington University. <rich.turner.ctr@osd.mil>

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