



## The 22nd Annual SEPG North America Conference

The 22<sup>nd</sup> Annual SEPG North America conference was held March 22-25, 2010 in Savannah, Ga., drawing nearly 800 attendees from across the globe.

Amidst a still-struggling economy, the philosophy among many attendees at this year's conference is that this annual gathering of process improvement professionals, and the knowledge-sharing opportunities, are needed now more than ever.

For four days, attendees sat in on presentations from industry-leading experts about the latest topics and trends in process improvement including the Capability Maturity Model Integration (CMMI), People Capability Maturity Model, Team Software Process (TSP), Personal Software Process (PSP), Agile, Six Sigma, ITIL and ISO standards, and other process management methods. Keynote Agustin De La Maza shared Softtek's experiences in positioning Mexico as a leader in global, near-shore sourcing; while Anita Carleton, acting director of the SEI's Software Engineering Process Management program, and Linda Northrop, director of the SEI's Research, Technology, and System Solutions program, discussed recent efforts to combine TSP with sound architecture practices to accelerate projects and to produce better products. In addition to the keynotes, a panel of three exemplars from Malaysia, Mexico, and South Africa provided a unique perspective on using productivity and product quality to capture a share of the outsourcing market.

SEI Member Karen Smiley—a frequent attendee and presenter at SEPG, and principal researcher in Industrial Software Systems at ABB Corporate Research in Raleigh, North Carolina—said four people attended from her organization in order to cover all the information presented in the various tracks. Smiley said that while she attended tracks on Agile development, others in the Corporate Research group attended presentations on CMMI for Services and appraisals.

“By being here in person, we can ask presenters direct questions on what data they have to back up the impact of what they're doing in practice,” Smiley said. “One person couldn't possibly cover it all.”

Erich Meier, CTO & “stages” chief architect at Method Park, and an exhibitor at SEPG North America 2010, expressed similar thoughts in his guest post on the SEPG blog, which can be read at <http://sepgconference.wordpress.com/>.

“A down economy also has its advantages. Effectiveness suddenly becomes an issue. With Savannah being our fifth SEPG, we really see a shift in the CMMI community. What really has changed from our perspective is the way people like to implement CMMI. More and more people are hunting for new approaches that make it easier to define and perform processes or speed-up SCAMPI preparations. Especially for organizations having to comply with multiple models (CMMI, ISO, SPICE, Six Sigma, LEAN, etc.) this becomes crucial,” wrote Meier.

*On the cover, SEI Members from left to right: Carissa Beford of the Naval Oceanographic Office, Glenda Holcomb of Science Applications International Corporation (SAIC), Sylvia Kuzmak of ManTech; and Violet Reed of the U.S. Army. Thanks to Anna Mosesso for contributing photography.*

**2** HILL AFB Teams See Improvement with TSP

**3** SEI Members: Win a Free Copy of Watts Humphrey's New Book

**4** New Book by Watts Humphrey Published

**5** SEI Member Profile: Michael Campo

**6** SEI Member Conference Savings Update: SEPG Europe 2010

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## Hill AFB Teams See Improvement with TSP

Initially, the 520th Software Maintenance Squadron of the 309th Software Maintenance Group of Hill Air Force Base in Utah used the SEI's Team Software Process (TSP) to manage the software maintenance for a large, embedded weapons system for the U.S. Air Force.

But in 2009, David Webb, a senior technical program manager with the project, says his team has expanded the use of TSP to the software testing team, the documentation team, and the support team for the Ground Theater Air Control System (GTACS), a deployable ground-based computer network that coordinates radar and communications data signals for ground, airborne, and naval elements. The team's sustainment of more than 3 million lines of GTACS code requires them to change software, hardware, test environments, and documentation.

TSP provides a framework designed to build and maintain more effective teams. The recent additions to the GTACS TSP teams—documentation, tool support, and test engineering teams, as well as the software team—held a launch in September, and Webb says they are now tracking their time and producing both team and personal schedules, employing an earned-value tracking system.

The teams are using TSP as they prepare to make the latest update to the GTACS system, which includes a major update of both outdated hardware and programming language.

The 520th Software Maintenance Squadron initially began work on the GTACS project in 1999, supporting the primary contractor. In 2007, the squadron took over as the lead contractor for software maintenance of the 30-year-old system.

Cost and schedule overruns soon followed, some portions taking more than four times what was planned, which Webb attributes to his team's initial lack of planning and inexperience with the system. For an organization with a maturity level 5 rating on the Capability Maturity Model Integration (CMMI) framework, it proved a concern.


"To achieve better planning and execution, we instituted TSP," Webb says, explaining that the approach allowed software engineers to plan, track, and thoroughly inspect their own work for quality purposes. Webb says that while each member of the team instituted the SEI's Personal Software Process (PSP), the team overall became more rigorous about inspections.

"Within a year the teams were routinely releasing software with very low or zero defects and meeting cost and schedule estimates. They improved their productivity by more than 400 percent," explains Webb, who is also an SEI Member.

The 520th Software Maintenance Squadron decided to expand the use of TSP beyond the GTACS software team because, according to Webb, it is an ideal framework for project planning and tracking and because it is the fastest way to train a new team unfamiliar with CMMI in high maturity concepts.

"It encapsulates everything you need to plan and track your project with TSP scripts, forms, and practice," Webb says.

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## SEI Members: Win a Free Copy of Watts Humphrey's New Book, *Reflections on Management*

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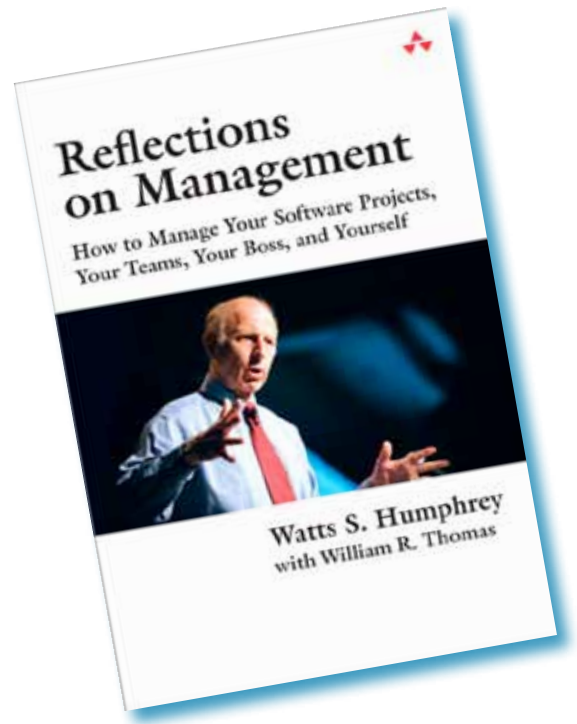
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## Noteworthy Technical Reports

The following SEI technical reports were recently published and can be downloaded for free:

### Testing in Service-Oriented Environments

[www.sei.cmu.edu/library/abstracts/reports/10tr011.cfm](http://www.sei.cmu.edu/library/abstracts/reports/10tr011.cfm)

By Ed Morris, William Anderson, Sriram Bala, David Carney, John Morley, Patrick Place, & Soumya Simanta  
CMU/SEI-2010-TR-011

This report makes recommendations for testing service-oriented architecture (SOA) implementations consisting of infrastructure, services, and end-to-end processes. Testing implementations of SOA infrastructure, services, and end-to-end processing in support of business processes is complex. SOA infrastructure is often composed of multiple, independently constructed commercial product—often from different vendors—that must be carefully configured to interact in an appropriate manner. Services are loosely coupled components which are intended to make minimal assumptions about where, why, and under what environmental conditions they are invoked. Business processes link together multiple services and other systems in support of specific tasks. These services and systems may operate on remote platforms controlled by different organizations and with different SOA infrastructures. Such complications make it difficult to establish appropriate environments for tests, to ensure specific qualities of service, and to keep testing up-to-date with changing configurations of platforms, infrastructure, services, and other components.

### Reports from the Field on System of Systems Interoperability Challenges and Promising Approaches

[www.sei.cmu.edu/library/abstracts/reports/10tr013.cfm](http://www.sei.cmu.edu/library/abstracts/reports/10tr013.cfm)

Carol A. Sledge  
CMU/SEI-2010-TR-013

This report identifies challenges and some successful approaches to achieving interoperability in systems of systems. Although systems of systems and their interoperability challenges are not limited to the U.S. Department of Defense (DoD), this report is based on the challenges and successes reported in interviews with various DoD personnel, with assurances of anonymity for those interviewed. Reported challenges and problems far exceeded the number of successes.

Reported successes with interoperability typically involved: (1) key individuals who had the knowledge, experience, and determination to ensure systems successfully interoperate in particular environments of use in the field; (2) systems incrementally developed and evolved, with continual integration incorporating tests for interoperability issues as they are discovered; or (3) systems of systems of smaller scope, constructed and fielded outside of the usual DoD acquisition program model.

## New Book by Watts Humphrey Published

A new book by Watts Humphrey, National Medal of Technology Winner and a senior fellow at the Carnegie Mellon Software Engineering Institute (SEI), has just been published by Addison-Wesley as the latest installment in the SEI Series in Software Engineering.

*Reflections on Management: How to Manage Your Software Projects, Your Teams, Your Boss, and Yourself* offers management insights and advice collected from Humphrey's previously published books, articles, and interviews. The essays draw upon Humphrey's nearly three decades in management at IBM, followed by his work at the SEI since 1986 in helping to develop the Capability Maturity Model, Personal Software Process, and Team Software Process.

"The management principles that I'm talking about in the book aren't software principles; they are people principles," Humphrey said, adding that when he arrived at IBM, he initially started working in hardware, as a computer designer and architect. He transitioned into software and, as director of programming and vice-president of technical development, supervised 4,000 software professionals across 15 laboratories and 7 countries. This transition from hardware to software management and the challenges Humphrey faced became the catalyst for Humphrey's foray into the field of knowledge work, a term initially coined in the 1970s by Peter Drucker to describe the intangible skills and know-how that many workers in information technology, as well as other fields, bring to their jobs.

"I discovered through this period that hardware management principles, while sound, weren't effective in a software setting," Humphrey said. "Software is large-scale knowledge work. It's hard to manage people when you don't understand what those people are doing."

When Humphrey joined the SEI in 1986, he made what he describes as an "outrageous commitment" to change the world of software engineering by developing sound management principles. He created the Personal Software Process (PSP) to help software engineers self-manage their projects using a disciplined, data-driven approach. In 2005, he was awarded the National Medal of Technology for his work in this field.

"Changing the world of anything is an outrageous personal commitment. That's what makes it outrageous. I felt it needed to be done. I knew I couldn't do it alone, and I wanted an environment where I could work with folks and do that," he explained.

The book, published in April, has already generated some positive reviews.

"Like many management books, especially those written by seasoned veterans like Mr. Humphrey, there are no surprises in the recommendations provided. What makes the author's points so well taken is his depth and breadth of experience coupled with the ongoing issues of quality control, team forming-storming-norming and project management," Dr. Dobb's blogger Mike Riley wrote in an April 16 post.

Humphrey credits the book's editor, Bill Thomas, with doing the legwork on the book to bring it to fruition. Over a three-month period in late 2009, Thomas read almost the entirety of Humphrey's published works: 11 books, and hundreds of technical reports, journal articles, and columns.

Thomas, who manages the Technical Communications team at the SEI, said that the idea for the book came from the realization that while a large amount of Humphrey's published work focuses on software-specific scenarios and implementing PSP and TSP, much of his work in management theory could be applied to any field. He added that Humphrey's personal anecdotes will resonate with almost anyone who faces a difficult management challenge.

"While he often describes success, just as importantly, he also recounts the times that he failed and how he learned to approach a problem differently the next time," Thomas said.

Humphrey, in the meantime, continues work on a new book with James Over, manager of the TSP team at the SEI, which focuses on TSP for senior executives. Humphrey, applying the management principles that he advocates in the book to his own work, hopes to complete the manuscript in the next few months so he can begin another.

"I really want to write one for the working engineer," Humphrey said. "That's what I want to do next."

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## Member Profile

### Michael Campo

Member Since June 2007

[michael\\_j\\_campo@raytheon.com](mailto:michael_j_campo@raytheon.com)

After helping Raytheon's Integrated Defense Systems (IDS) achieve the highest maturity level of the Capability Maturity Model Integration (CMMI) methodology, Michael Campo decided to take on a new role: process technical director.

"I wanted to have an impact on more parts of Raytheon IDS, to help other Raytheon businesses, and work on CMMI Version 1.3 teams," he said.

In Campo's new role, which he started in 2009, he represents Raytheon on a number of process-related working groups. He serves on the National Defense Industrial Association (NDIA) CMMI working group, where he works to develop products to support the adoption of CMMI in defense and commercial industries. In that role, he recently served as lead author of the technical report *The Economics of CMMI*, which describes strategies for executive sponsors and CMMI implementers to improve performance return on CMMI investments. He also contributed to the NDIA position papers, *The Effective Use of CMMI*, and *CMMI for Executives*.

Campo is also extensively involved with the SEI in the development of CMMI Version 1.3, which is scheduled for release in November. He serves on the Core Model Team, the Configuration Control Board, the Training Team, and also as an industry pre-reviewer of proposed high maturity changes.

As process technical director at Raytheon IDS, Campo works with other Raytheon businesses as an internal consultant to CMMI high maturity practices. A certified Introduction to CMMI instructor, he provides CMMI training across Raytheon and has been a lead appraiser and team member on many Raytheon CMMI appraisal teams. He also led a corporate CMMI Expert Team that coordinated CMMI-based process improvements company-wide, and serves as the SEI business point of contact for Raytheon as an SEI Partner organization.

From 1999 to 2008, during his tenure as Engineering Process Group Leader, he used the SEI's CMMI framework to support the 6,500 systems, software, and hardware engineers in Raytheon's IDS division.

"Back in April of 2000, we were one of the first organizations to pilot a CMMI appraisal, using CMMI version 0.2b (2 beta). The model hadn't even been released yet," Campo added.

Raytheon IDS achieved maturity level 4 in 2005 and maturity level 5 in 2008. While Campo initially focused on software engineering, he expanded the scope into systems engineering and, later, hardware engineering.

"Expansion brought new perspectives from the different engineering disciplines and different types of issues associated with systems, software, and hardware engineering," he said. Since achieving CMMI maturity level 5, Campo said the greatest value came from the higher maturity levels including improvements in quality, cost, schedule, and customer satisfaction. "Ultimately what we saw was a 24-to-1 return on investment from achieving maturity level 5."

Campo credits the math degree he earned from the University of Massachusetts at Amherst for his initial interest in process improvement. In the early 1990s, managers asked him to lead efforts to define software metrics for various development projects. In 1999, he took the role on full-time.

Prior to his arrival at Raytheon in 1978, Campo worked as a math teacher at a public school in Sutton, Mass. After deciding that software engineering would be a growing field, he was hired at Raytheon as a software engineering developer.

In 1984, he was promoted to Software Integration Leader for the Patriot missile system. In that role, Campo was responsible for requirements analysis, integration test plans, software releases, defect tracking, and support of verification and validation testing. Over the next eight years, he traveled extensively, testing missile systems in deserts throughout the United States and at NATO sites in Germany.

"In the desert, you're testing radar systems in the conditions in which they will ultimately be used," Campo explained, adding that visits to NATO sites in West Germany during the Cold War were completely surreal. "It was such a contrast to be inside the fenced perimeter of a NATO site, with armed soldiers, and then see nothing outside the fence but sheep, farmers, and rural countryside."

*"In the desert, you're testing radar systems in the conditions in which they will ultimately be used,"*

Today, Campo continues his work as a certified CMMI instructor and routinely travels to Raytheon sites teaching the Introduction to CMMI course. He regularly participates in the CMMI High Maturity Measurement and Analysis Workshops hosted by the SEI's Software Engineering Measurement and Analysis team; co-authoring four papers as a result of his involvement. Excerpts from his work are included in an SEI technical report, published in January, *Approaches to Process Performance Modeling: A Summary from the SEI Series of Workshops on CMMI High Maturity Measurement and Analysis*.

He became an SEI Member in 2007. "We get discounts for SEPG conferences, training, and books, and a nice member luncheon at the SEPG conferences. Membership provides an opportunity to network with peers and share different experiences," Campo said.

He participated on the team that developed the SCAMPI Lead Appraiser Body of Knowledge and was an abstract reviewer for the 2010 SEI SEPG North America Conference. His contributions also include presenting at international conferences and publishing in *Crosstalk Magazine*.

**The technical reports found above can be downloaded, for free, at [www.sei.cmu.edu/library/abstracts/whitepapers/economics-of-cmmi.cfm](http://www.sei.cmu.edu/library/abstracts/whitepapers/economics-of-cmmi.cfm) [www.sei.cmu.edu/library/abstracts/reports/09tr021.cfm](http://www.sei.cmu.edu/library/abstracts/reports/09tr021.cfm)**

**To watch a video of Campo discussing the benefit of high maturity level 5, please visit <http://sepgconference.wordpress.com/>**



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