



Software Knowledge Management Strengthening Our Community of Practice

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When we do something together over time, we create shared practices. We learn to do what needs to be done, we learn about each other, and we develop shared ways of doing things. We form *communities of practice* in which sharing is a natural part of belonging. Indeed, “knowing” implies social communities, because facts alone have no meaning outside a shared context.

Our software community of practice is such a familiar experience that many people may hardly notice it. Its identity derives from participation, and it is self-organized around important matters through dynamic renegotiation of what the profession is about and what needs doing and learning. The boundaries are defined by actual participation, not by affiliation or title. It follows the contours of common practice and is held together by knowledge rather than task. Interaction among practitioners continually refines and develops the elements of the practice. That which is an improvement is adopted into the body of knowledge. Failure to interact regularly with other members of the community will eventually result in estrangement from it. These realities are indicative of why the identity of our software community of practice is continuing to evolve.

Our software community of practice develops resources such as shared learning and practices. Organizations such as the Software Engineering Institute (SEI) and the Software Technology Support Center (STSC) facilitate the capture and transfer of knowledge criti-

cal to our software community practitioners. Through STSC-refereed articles, *CROSSTALK* functions as one of our software community’s key conduits for transferring knowledge. Important online resources have also become part of many organizations’ virtual infrastructure, particularly the Web sites of the SEI,¹ the Software Engineering Information Repository,² the STSC,³ the Embedded Computer Resources Support Improvement Program (ESIP),⁴ the Data and Analysis Center for Software,⁵ the Software Program Managers Network,⁶ and the Defense Acquisition Deskbook.⁷

The annual Software Technology Conference⁸ and SEI Symposium and Software Engineering Process Group Conferences⁹ are forums that provide vital interaction opportunities for our software community because they provide the necessary facilities of belonging: alignment, engagement, and exploration. They provide time for reflection and the unstructured personal contact so vital in the exchange of information and the development of community resources. As valuable as the seminars are in each of these forums, I contend that in their absence, many people would continue to pay to attend the conferences for the networking opportunities alone. Perhaps, to extend and energize our community of practice, we should consider offering a new conference registration category called “networking only.”

An organization’s software community of practice is critical to its success. The community may exist informally within and across business units and projects and often across organizational

boundaries. To gain the most leverage, it maintains links outside the organization to strengthen its knowledge base. Communities of practice are organizational assets because of the knowledge they steward at their core and through the learning they inspire at their boundaries. The learning potential of an organization resides in the interaction of cores and boundaries in “constellations” or clusters of different communities of practices.

I contend that the use of the Capability Maturity Model Integration (CMMI)¹⁰ product suite, being released this year, will have one of the more revolutionary impacts on organizational constellations of communities of practice because the CMMI addresses enterprise-wide, integrated process improvement that cuts across traditional disciplinary boundaries. What will transform an organization or community of practice is not what an individual knows or single function controls but what a group knows and causes to happen. Processes and practices that cross disciplines and functions provide the basis for group “passion” or motivation. Use of integrated knowledge within and among communities of practice should prove to be the most sustainable and profitable aspect of any organization.

Organizations cannot truly manage knowledge because it is tacit or internal to individuals; however, they can manage the environment necessary for the community of practice to flourish and share information that is a product of that knowledge. For organizations to successfully compete in an era of rapid change, they need to invest in connectivity more than information. Using the leveraging capabilities of the Internet and Intranets, organizations need to establish their own virtual knowledge management infrastructure that evolves

see COMMUNITY, page 10



On the front cover:

From the upper right corner, clockwise: Kevin Tjoland (TISFD), David Haakenson (TISFB), Ken Raisor (TISHD [TaskView TSP Project]), Mark Peterson (TISFD), David Webb (TISHD [TaskView TSP Project]).

management, Pat Cosgriff for SEPG support, and Jim Van Buren of the STSC for PSP consultation.

For quality engineering work, consistent and informed management leadership is essential. For their trust in us and their willingness to support us in pioneering the early use of TSP in practice, we thank Dan Wynn, Robert Deru, Don Thomas, LaMar Nybo, and Eldon Jensen. Lt. Col. Jacob Thorn, the TaskView program manager at Eglin Air Force Base, Fla., also supported our process improvement initiatives. His dedication to quality and informed oversight made the job possible.

We also thank those who reviewed this article. Their comments and suggestions were a great help. Our particular thanks to Rushby Craig, Walter Donohoo, Linda Gates, John Goodenough, and Bill Peterson. Finally, the professional help and guidance of the *CROSSTALK* staff have, as always, been a great help.

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as a technical program manager for TIS mission-planning software. He has participated in three CMM-Based Appraisals for Internal Process Improvement, including TIS's 1998 Level 5 assessment. He has also been certified by the SEI as a PSP course instructor.

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Process (1989), *A Discipline for Software Engineering* (1995), *Managing Technical People* (1996), and *Introduction to the Personal Software Process* (1997).

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2. Ferguson, Pat, Watts S. Humphrey, Soheil Khajenoori, Susan Macke, and Annette Matvya, "Introducing the Personal Software Process: Three Industry Case Studies," *IEEE Computer*, May 1997, pp. 24-31.
3. Humphrey, Watts S., *A Discipline for Software Engineering*, Reading, Mass., Addison-Wesley, 1995.
4. Humphrey, Watts S., "Using a Defined and Measured Personal Software Process," *IEEE Software*, May 1996.
5. Humphrey, Watts S., "Three Dimensions of Process Improvement, Part II: The Personal Process," *CROSSTALK*, Software Technology Support Center, Hill Air Force Base, Utah, March 1998, pp. 13-15.
6. Crosby, Philip B., *Quality Is Free: The Art of Making Quality Certain*, McGraw-Hill, New York, 1979.

COMMUNITY, from page 2

as part of the employees' routine information flow. In addition to providing the infrastructure, organizations have to invest in hiring smart people and providing incentives for sharing information, then provide enough unstructured time to let people talk face to face. Such an environment will allow organizations to capitalize on their constellations of communities of practice.

People who appreciate the need for software knowledge management and who have the capacity to inspire or take the lead in providing the guidance and resources necessary to share information will continue to be invaluable. They can help any organization capitalize on opportunities by facilitating the enablers that are vital to our software community of practice. ♦

Notes

1. <http://www.sei.cmu.edu>
2. <http://seir.sei.cmu.edu>
3. <http://www.stsc.hill.af.mil>
4. <http://esip.hill.af.mil>
5. <http://www.dacs.dtic.mil>
6. <http://www.spmn.com>
7. <http://www.deskbook.osd.mil>
8. <http://www.stc-online.org>
9. <http://www.sei.cmu.edu/products/events>
10. <http://www.sei.cmu.edu/cmm/cmms/cmms.integration.html>