Web-Based Software Process Improvement Repository

This paper describes the structure and contents of the Space and Naval Warfare (SPAWAR) Systems Center, San Diego's web-based Software Process Improvement (SPI) repository. The Software Engineering Process Office (SEPO) has provided its software engineering Process Asset Library (PAL) in the public domain in order to foster continuous software process improvement throughout the software engineering community.

The Organization Process Definition Key Process Area (KPA) of the Software Capability Maturity Model® requires organizations to provide a repository of software engineering processes. SEPO, a Software Engineering Process Group at the SPAWAR Systems Center, San Diego has provided its repository at http://sepo.spawar.navy.mil to meet this requirement.

Organizations embarking on the SPI journey often do not know how to begin. Other organizations are implementing SPI, but have missing pieces. Some organizations have implemented SPI, but lack information about what other organizations have done that could help them improve their existing processes. The needs of these organizations can be met by sharing process assets and knowledge among the software process improvement community. SEPO began an effort to accomplish this by providing its software process assets and other SPI information on the Web and in the public domain.

Background

More than three years ago, our organization embarked on a modest effort to provide our product and process assets in electronic form via the Web. The primary goal was to provide software engineering information that could be located and quickly downloaded by our software projects. Hence, the Web page is plain and simple. As we worked through the site design, we decided to use our page not only as a repository for our process assets, but as a repository for all our assets, with a few exceptions, and available in the public domain. Our reasoning was three-fold.

First, many contractors provide support to our organization's projects. Putting our page in the public domain enabled them to have easy access to our products and saved us the administrative difficulties of giving out passwords and user accounts to gain access. It was also hoped that making the repository easily accessible to our contractor community would encourage the use of our products, thereby benefitting our organization.

Secondly, we wanted to share our process assets with the software community at large, hoping it would provide us feedback on our products so we could improve them. We have had many site visitors and lots of appreciation for availability of our products, but few comments on artifact content.[1]

Our third goal was to give other organizations implementing SPI efforts an example of how one organization implemented it. They could then begin their own program, fill in missing pieces of an existing one, or improve current processes using information from the repository. This is our contribution to spreading SPI.

Web Page Layout

The home page is made up of a main page that contains a navigational table at the top and information about "What's New," "Hot Topics," and "Upcoming Events" at our organization (see Figure 1). The rest of the page is divided into three sections titled "SEPO Resources and Software Engineering Information," which contains information about software process improvement at our organization; "Other Sources of Software Engineering Information," with links to other software engineering sites; and "Other Links," which contains links to sites on topics that may be of interest to software engineering professionals.

The Process Repository

The majority of the software process improvement repository can be found by clicking on "SW Eng Processes and SW Docs" located in the navigation table at the top of the main page. Clicking on this will bring you to "Software Engineering Processes by KPA" at http://sepo.spawar.navy.mil/docs.html (see Figure 2). Process assets are divided by KPA levels. Each KPA contains our organization's policy for it, a process definition (if one exists), and other supporting information.

Other information includes sample plans, templates, and other documents from our organization and others. We also include internal processes we use in the day-to-day office operations. We do not have a complete set of process assets for every KPA, but we are working toward that goal, and have placed many products on the Web page knowing they are not perfect. Our philosophy is to provide preliminary and in-process products to our software projects, so they may benefit from the latest process information.

Training modules exist for many KPAs, but have been intentionally left off of the Web page as we think training encompasses more than just presentation material. To get the full value from the training materials, it is best to attend the classes. Detailed descriptions for many of our training courses are available at http://sepo.spawar.navy.mil/training.html.
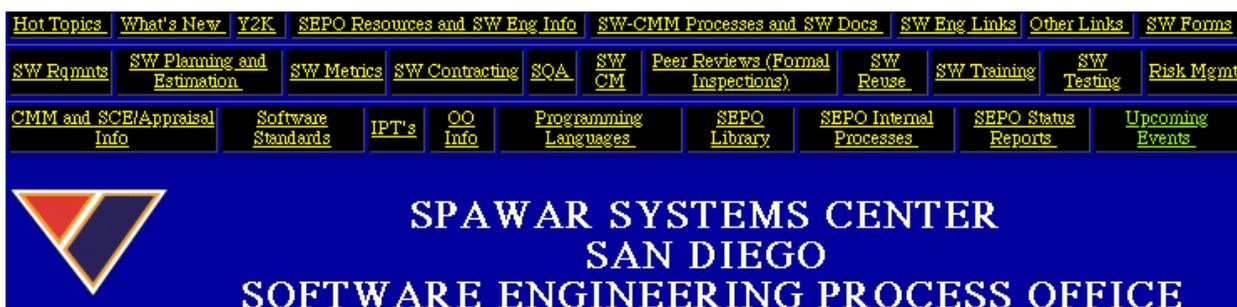

Figure 1. *The top of the SEPO web page includes a navigation table at the top of the page for quick access.*

Other Benefits of a Web-Based Repository

We met our original goals in development of the Web page, and there have been other benefits. For example, we no longer have to provide students with large volumes of course reference materials for our training courses because they are now available electronically. In one instance we were able to eliminate two large bin-ders of reference material, saving duplication costs and saving the students from lugging around course reference materials.

Electronic versions of reference material also enables students to have access to the most current version of the material, rather than using hard copies of material, which can become dated.

Another benefit was our ability to monitor internal and external Web page usage. We can easily view what organizations are currently logged on to the page. This gives us some insight into the magnitude of SPI internally and externally to our organization. We also use a shareware program to keep statistics on the Web page activity located at http://sepo.spawar.navy.mil/webstat.html. Over a given period of time we can see what organizations have logged onto the page and what products have been downloaded. This information helps us determine the priority of our product updates based on usage. Finally, by monitoring our Web page usage, we have verified that software process improvement is truly a world-wide phenomenon touching a wide variety of organizations from government, to banking, to insurance companies, to utilities.

Web Page Comments

We have been online for more than three years and have received more than 50,000 hits, which is respectable for such a specialized site. We have received hits from all over the world, from Argentina to Thailand, and many favorable comments. Here are a few examples from members of the software industry external to our organization:

"I have been using your home page for a while now and still find the information available, including links, fascinating reading. Your home page is the most comprehensive site I have found that is CMM®. I promote the fact that a Navy organization maintains the best site. Thank you for a job well done and please continue to support the home page."

"This site is the most valuable site I could find on software development. The amount of documentation made available on software process is unbelievable. I could practically find all the documentation I needed to set up an organized development team, handle software projects, and improve such projects. Please continue to keep this site in existence since it is of utmost value to the developers who wish to enhance their knowledge of the software process."

"The SEPO Web page is a truly superb product! Excellent information, excellent links to related and backup information. Indeed, it is one of the best and most content-laden software engineering Web pages anywhere. No one practicing software engineering in a DoD (or even U.S. government) milieu should be unaware of it."

"I have been tasked to develop a 'standard' cost estimation process for (my organization). I intend to base this on the Software, Size, Cost, Schedule, Estimation Process document I downloaded from your Web site. I will include in the forward to our document credit to your command and team that developed the original document. I intend to 'adapt freely' your product to (my organization's) problem domain as an example of process improvement . . . I will provide a draft copy for your review when it becomes available. Thank you!"

From the March 1997 issue of CrossTalk: "[This home page] has links to many major DoD and industry software policy and engineering home pages. It makes a great starting point to explore what is available."

Summary

The SEPO home page represents the culmination of our SPI efforts to date. We encourage organizations embarking on SPI efforts to review our page and take freely any of the products that interest them. However, we ask that you provide us feed-back on our products so we are able to continuously improve upon them—that is what SPI is all about. We encourage other SPI organizations to share their products and information with the software engineering community so that we all may improve on our efforts. Several organizations are already doing this, and we have used and appreciate their products, but more organizations need to contribute to this effort. Working together, we can make SPI a reality in every software engineering organization. Whether you are just beginning your journey, looking to fill in a few missing pieces in your program, or are interested in improving your processes based on what another organization is doing, we hope that our Web-based SPI repository will help you meet your needs.

Note

1. We hope readers will use some of our products and provide feedback.

About the Author

Brian Groarke has been a member of the Space and Naval Warfare (SPAWAR) Systems Center, San Diego Software Engineering Process Office (SEPO) for the past five years and has more than 16 years experience with the Navy. Before coming to SEPO, he worked on several software projects as a team member and software project manager. He is one of the key instructors for the SEPO Software Project Management course and is the developer and maintainer of the SEPO Web page. Groarke holds a bachelor's degree in computer science from Purdue University.

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CMM Level 2 KPAs	CMM Level 3 KPAs	CMM Level 4 KPAs	CMM Level 5 KPAs
● Requirements Management	● Organization Process Focus	● Quantitative Process Management	● Defect Prevention
● Software Project Planning	● Organization Process Definition	● Software Quality Management	● Technology Change Management
● Software Project Tracking and Oversight	● Training Program		● Process Change Management
● Software Subcontract Management	● Integrated Software Management		
● Software Quality Assurance	● Software Product Engineering		
● Software Configuration Management	● Intergroup Coordination		
	● Peer Reviews		

Visit this site on the World Wide Web at http://sepo.spawar.navy.mil

Figure 2. *Most SPI products are organized by KPA.*