

Software Standards and Models: Forward Reconnaissance

By Theresa Hunt

Numerous standards and process models apply to the software development industry and a company's strategic adoption of a standard or model requires forward-looking analysis of the direction of their evolution, associations, and ties. This article is a summary snapshot of the current state of certain key existing and emerging software related standards and models. Addressed are the International Standards, the commercial, professional, or industrial association documents, and the capability models.

Just when you are sailing along smoothly with your ISO 9001 registration, a new International Standard for software process assessment appears in your sight: *ISO/IEC 15504 Information technology -- Software process assessment*. What? You ask, I develop software; will I have to become registered to that one also? No one has verbalized the real answer to this yet, but there are plenty of organizations in the business of registering companies to the ISO 9000 standards that would be happy to expand their arena. And, should such a registration scheme materialize, wouldn't companies desire the ability, or feel the need, to state their proven conformance to the latest software standard, especially if software development is a large part of their organization?

Let's say you are contemplating whether you should invest in an assessment of your company or project to a capability model such as the Software Engineering Institute's (SEI) recently evolved Capability Maturity Model – Integrated (CMMI) because you have heard of the Office of the Under Secretary of Defense's (OSD) directive for certain systems to be awarded only to those companies who are CMM Level 2 or equivalent (the key word here being "equivalent"). What do you do? Invest in a formal assessment using the CMMI that evolved from the tried and true CMM products, or wait and use the soon to be published exemplary model in ISO/IEC 15504 which will establish a basis for all other models, including the CMMI, to be conformant to?

And what about the commercial/professional complement of ISO 12207 Information Technology - Software Life Cycle Processes, known as IEEE/EIA 12207 Information Technology - Software Life Cycle Processes? How does this document tie in with other software related International Standards?

To determine a course of action, you must first know in which direction the key standards and models are headed. Since these standards and documents are currently moving targets, your decision (should it have to be made in the near future) will necessarily be based on intuition and cues, your job is to know as much as possible about their status. At the date of this writing the following statuses represent their current state:

The International Standards and Guidelines:

ISO/IEC 15504 Information technology -- Software process assessment is still at the Technical Report (TR) phase but is expected to complete the update process and be issued in whole as an International Standard in 2002. It has been consolidated from 9

parts down to 5 with part 5 containing what is referred to as the “exemplary model”, the model to which other process documents, like the CMMI, are required to be conformant. The substance parts are to be published in increments, the order of which will be part 2, 3, 4, then 5. Part 4 is currently in the voting process. Part 1 consists of the concepts and introductory guide and vocabulary; part 2, the rules for performing an assessment; part 3, a guide to performing assessments; part 4, a guide to use the results of the assessment in process improvement and capability evaluation; and part 5 which contains the reference (exemplary) model for processes and process capability. When adopting the standard a company may use the reference model in part 5 or another conformant model such as the CMMI.

ISO/IEC 12207 Information Technology - Software Life Cycle Processes is currently in a study phase. It will then be revised for use by the new ISO 15504. Commencement of the revision phase is waiting for the new ISO 9000-3 Guideline for applying ISO 9001 to the supply and development of software, and ISO 15288 Systems Engineering to ensure harmonization.

ISO 9000-3 Guidelines for the application of ISO 9001 to the development, supply, and maintenance of software is at the working draft level in the process of being re-issued to make it consistent with ISO 9001 Quality Systems (2000). New standards and standards undergoing update start at the Working Draft level, then progress through a Committee Draft (CD) level, a Final CD Draft, and are then published as a Draft International Standard (IS).

ISO 15288 Systems Engineering is currently at the Committee Draft (CD) level; it is then expected to emerge as a final CD in Fall 2001.

ISO 15939 Software Measurement Process evolved from the DoD's Practical Software Measurement (PSM) document. It is at the final CD level (was voted on in May 2001) and by the end of this year is expected to be at the Draft IS level. ISO 15939 addresses how to do software measurement not what to measure.

The Commercial, Professional, or Industrial Association Documents and the CMMI:

IEEE/EIA 12207 Information Technology - Software Life Cycle Processes will most likely undergo the same harmonization updates as its ISO counterpart.

CMMI Capability Maturity Model – Integrated The CMMI specification included a requirement that the CMMI Product Suite be consistent and compatible with ISO/IEC 15504. This will allow companies to elect to use the CMMI model in lieu of the exemplary model in ISO/IEC 15504. Version 1.1 of the CMMI is currently planned for release at the end of 2001. This release is limited to fixing problems that hamper adoption of the model.

AAMI/FDSB-1 SW68 Medical Device Software – Software Lifecycle Processes is a brand new American National Standard from the Association for the Advancement of Medical Instrumentation. It was approved by the AAMI Standards Board in March 2001 and by the American National Standards Institute (ANSI) in May 2001. It is now being copyedited and publication is expected by mid-August 2001.

Conclusion

There are other standards that you may be interested in monitoring but these are receiving the most attention at this time. It is important to note that adoption of any standard or model should be with the intent of improving your software development processes as well as making a strategic selection based on industry trends. Investigate the interrelationships between the various models and standards and based on your industry, choose those that will position you for the most likely scenario and the most beneficial return.