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Proposal for a Study Period to Investigate
the Feasibility of Developing Standards in the Area of Tool Compliance

Introduction

During the course of its work on ISO/IEC 14102:1995 Guide for the Evaluation and Selection of CASE tools and Project 7.32, CASE Adoption, WG4 has seen that one of the obstacles to the success of CASE technology has been uncertainty over tool capabilities. Users have reported purchasing tools which subsequently do not perform as expected or as advertised. In other cases, potential users have reported that they have not purchased CASE tools because of the perception of poor performance and doubts about the user organization's ability to adequately evaluate whether a tool will meet the organization's requirements upon purchase. The two standards mentioned above should help alleviate the situation, but there is a need for more investigation into the ability to demonstrate a tool's compliance to a standard.

Benefits

The existence of certified tools would have a number of benefits:

- User's will be able to realistically establish tool expectations.
- User's could select tools with increased confidence of obtaining a positive return on their investment.
- User's evaluation and selection of tools would be focused on business and user-related criteria, because the tool's certification provides technical qualification.
- Manufacturers of compliant tools will have a clear market advantage.
- Manufacturers of lower quality tools (non-compliant) will be encouraged to improve them to a level of compliance.

A compliance approach was not possible in the past because there were no accepted standards against which compliance could be measured. In 1995, two standards were adopted which changed that situation. ISO/IEC 12207:1995, Software Life Cycle Processes, defines the software engineering life cycle, and specifies support requirements for each of a number of processes. ISO/IEC 14102 is based in part on ISO/IEC 12207 and identifies tool functions for most of the ISO/IEC 12207 processes. The prerequisites are now in place for a consideration of tool compliance standards.

Work to Date

During its SEE study period (see 4/N-173), WG4 has investigated the question of tool compliance standards: we have queried experts (in person and via e-mail), contacted tool vendors, and identified specific areas for which standardization might be both feasible and appropriate.

Purpose of the Study Period

The JTC1 Directives identify a number of required outputs of a study period, and they will not be repeated here. The purpose of a study period is to generate those outputs. The effort will place its initial emphasis on answering the following questions:

What is the best structure for tool compliance standards? The original concept espoused by some members of WG4 was for the development of a compliance standard for each appropriate ISO/IEC 12207 process. While it may be feasible to develop a compliance standard to cover completely one of the 12207 processes (e.g., CM), it may be more appropriate to try to develop such a standard for one or a group of 12207 activities or tasks. The smaller scope may enable the development of more focused standards, and to develop them more quickly. It may be possible to develop an “umbrella” compliance standard which defines what is meant by tool compliance and clarifies issues such as partial compliance, levels of compliance, etc., and is augmented by specific functional compliance standards for processes, activities, and/or tasks.

What areas should be addressed first? ISO/IEC 12207 areas to be addressed should be prioritized based upon: ability to develop a standard, market need (importance to users and tool manufacturers), and feasibility of tool manufacturers coming to compliance.

What is the scope of developing such a standard? What level of detail is necessary in defining tool functional requirements? To what extent, if at all, should the standard define or specify compliance test requirements? In addition, there are a number of technical questions relating to the structure of such compliance standards (e.g., levels of compliance, partial compliance).

Are there sufficient appropriate personnel available to develop such a standard? It is clear to the members of WG4 that we must have representation for tool manufacturers to pursue this effort. WG4 has no such representation at the present time. We have identified one such organization which has expressed an interest in participating, but feel that at least 2 or three more are necessary.

If these questions can be resolved in a positive manner, then the study will proposed the development of one or more NP proposals.

Activities

In order to assess the feasibility of this work and to define its scope, we propose to develop a conceptual specification for a standard for CM, an outline for an umbrella standard, and, if possible, conceptual specifications for one or two specific functional standards. These will be reviewed at the 1996 WG4 interim meeting.

We will obtain and review other existing compliance standards. It is known that such standards exist; the extent of their applicability to SEE tools will be investigated.

We will also try to obtain commitments from several CASE tool vendors to participate in these activities. We will individually solicit participation from US, Japanese, French, and Canadian CASE tool manufacturers. We will also follow up any contacts provided us from other sources. We will solicit SC7 for points-of-contact for tool manufacturers and certification organizations.

We will investigate technical issues relating to certification. We will begin by tapping sources at NIST, the Ada Compiler Validation Facility, and the POSIX community. We will invite WG11 to have a joint session at the interim 1996 meeting to share results and consider whether further efforts are necessary and if so, what level of cooperation is appropriate.

Personnel

The study period will be performed by WG4, as part of our program of effort. Work item 7.32 has reached a state where little effort is necessary, and the Software Engineering Environment Reference Model effort, if approved, has an excellent base document from which to start, and will not occupy all existing available resources. In addition, we expect additional support from Australia, Italy, and the U.K. While personnel resources for developing the actual standards may require additional experts, there is little question that more than sufficient support will be available to effectively pursue the study effort.

Liaison

ISO/IEC JTC1/SC7 WG11
IEEE Computer Society Software Engineering Standards Committee (existing C
liaison)

Schedule

Activities commence immediately	June 1, 1996
Contact other CASE tool manufacturers	through August 1, 1996
Discuss conceptual standard specifications	October 21-6, 1996
Discuss compliance issues and research to date with WG11	October 21-6, 1996
Develop initial draft of Study Period Report	October 21-6, 1996
Review progress to date and plan further activities	October 21-6, 1996
Final Study Period Report	June 10, 1997
Forward NP proposals to SC7 for distribution & ballot	Interim WG4 meeting, 1997