Impediments to the Software Reuse Industries

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Abstract

The software industry and the reuse industry are facing far too many impediments to become viable without better government support. This support must materialize in several areas: eliminating or better documenting and controlling software patents, improving the national information highway, establishing new laws to wisely protect the free exchange of information between our universities, and reducing barriers to trade, particularly export controls. With these impediments, far too much energy in the software industry as a whole is spent in meeting the letter of the law and going to court. This energy could be better spent in producing new products and advancing the technology.

Keywords: Software patents, Software reuse component industry, Export controls, National Research and Education Network, Ada Software Repository, Public Ada Library, information highway, freedom of exchange, reuse economics

Workshop Goals: Learning; networking; start promoting a correction to the existing legislation pertaining to the software industry in the United States in order to remove impediments to the operation of the industry

Working Groups: Reuse management, organization and economics; Education; Reuse handbook

1 Background

I have managed the Ada Software Repository (ASR) on the Internet since November, 1984. The ASR started as a voluntary activity, was funded by the DoD for six years, and reverted to a voluntary activity. I currently manage the Public Ada Library (PAL) at Washington University in Saint Louis, which I started in June, 1993. The PAL is currently a voluntary activity, but DoD funding is anticipated. I have performed research in the broad field of software reuse, including both the technical, political, and DoD issues, for the MITRE Corporation. I have authored a tutorial on software reuse as a result of this research and am in the process of completely documenting this research in a detailed paper. I have developed reusable components for both commercial and military applications in Ada, C, and assembly language for over 10 years. I have developed reusable components in C++ for over 3 years. I have authored a book on the ASR and the Defense Data Network and several papers on the ASR, reuse, object-oriented design, and software engineering. I have taught courses in software engineering, object-oriented programming, and object-oriented design as an Adjunct Professor at the University of Cincinnati (Ohio) and Monmouth College (New Jersey) for over 5 years. I participated in the review of the document *Ada Quality and Style: Guidelines for Professional Programmers* by the Software Productivity Consortium.

2 Position

The laws pertaining to software patents must be reworked extensively so the patents are clearly understood. The issuance of software patents, particularly for algorithms and "look and feel" concepts that can be readily rediscovered/invented, must be stopped or at least more wisely controlled. The ability to issue a patent on a well-known algorithm that has been known to the public for some time must be denied. The patent approval process, wherein it can take up to five years to issue a patent in an industry that is evolving radically over the span of a single year, must be replaced with something more timely and effective. To spend years working on a program only to find that it violates some patent that was in the process while you were working on the program and could not possibly have known about it is ridiculous. It may be best to abolish the idea of patenting software, using the copyright as the only means of rights protection. Copyrights on "look and feel" should not be allowed; copyrights only on actual software source code should be allowed.

The national information highway is currently based on the Internet, and efforts are underway to improve a portion of the Internet by forming the NREN (National Research and Education Network). Technical barriers to making this happen are already overcome to a large extent. Political barriers are far more difficult to overcome, particularly with special interest groups lobbying in their own interests instead of in the national interest. Consequently, an industry-based reuse council and an education program for Congress must be set up to look out for the national interests and to keep Congress informed of the issues.

A similar university-based council and education program for Congress must be set up to look out for the national interests in terms of the free exchange of information between our universities.

Too little attention is paid to the economics of software reuse, and a "standard" economic model for software reuse should be developed. The cost of reusing software must be less than the cost of developing new software, but much of the reuse efforts today do not consider the cost factor.

Finally, export controls placed on the software industry have been ineffective and served mainly to hurt the software industry as opposed to afford the protection they were originally intended to provide. These export controls must be removed.

3 Comparison

Richard Stallman [1, 2] addressed several of the copyright and software patent issues. I tend to agree with his perceptions, except that they are somewhat extreme and the actual solution is probably something somewhat more moderate.

The Central Archive for Reusable Defense Software [cards93a] addressed many of the essential issues for implementing reuse on the information highway. The CARDS execution is lacking, however, and many of the concepts promoted by the Public Ada Library [3] should be used to augment the concepts of CARDS.

The Reuse Economics Model [4] of the SPC makes a good attempt at defining an economic model for software reuse, but it is not complete. The economic model presented by the author [5] is also incomplete. Issues such as these models should be brought into the spotlight of the reuse community and a viable "standard" model should be drafted.

References

[1] R. Stallman, "Keynote Speaker Presentation: Against User Interface Copyright," in *Proceedings of Tri-Ada 92*, pp. 9–13, Tri-Ada 92 Conference, November 1992.

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[3] R. Conn, "Public Ada Library Frequently Asked Questions," Tech. Rep. July 1993, Public Ada Library, July 1993.

[4] B. Jenkins, "Reuse Economics Spreadsheet Model User Manual Version 01.00.00," Tech. Rep. SPC-92068-C, Software Productivity Consortium, May 1992.

[5] R. Conn, "Ada Software Repository Experiences and Lessons Learned," in *Minutes: Ada Board Meeting, December 4 and 7, 1992* (A. Board, ed.), p. Attachment 4, Ada Information Clearinghouse, 1992.

4 Biography

Richard L. Conn is a Member of the Technical Staff for the MITRE Corporation, Eatontown, New Jersey, a Research Professor for Monmouth College, West Long Branch, New Jersey, and a member of the Federal Advisory Board for Ada, Undersecretary of Defense for Research and Engineering. He is performing research on software reuse and is developing Ada and C source code analysis tools. He teaches courses in Object-Oriented Design, Software Tool Construction, and Software Engineering for Monmouth College. Richard currently manages the Public Ada Library at Washington University in Saint Louis. He received a Master of Science in Computer Science from the University of Illinois in 1978.