



Thinking about Best Practices for Standards

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From bar rooms to board rooms the same concerns are heard.

- We need standards, but only if they work.
- We are afraid the wrong standards will become accepted.
- Do we get enough out of our participation in standards development?
- Standards are not developed fast enough.
- Is the formal standards process still relevant?
- Will vendors adopt standards that give us what we want: interoperability, smooth migration from legacy systems, flexibility, reasonable price and good functionality?

I believe these concerns are an inevitable consequence of the technology, market structure and user needs of our age. The problems cannot be solved, but they can be lessened. As a matter of faith (for certainly there is little evidence) I believe they can be lessened to a great enough degree to make a practical difference in the technology available to us. In large measure this issue of StandardView was my attempt to test whether my faith is well placed. I wanted to explore two questions:

- Can we identify the design constraints on standards development?
- Working within those constraints, can we formulate practical solutions that will make a discernible difference in how standards affect technology?

Starting a Discussion

I see the articles in this issue as a beginning. My intent is to spur a national, inter-disciplinary dialogue on what best practices for standards development are, and how those best practices can be implemented. I hope you will actively join the discussion because good standards make a real difference to entire industrial sectors. My business, and the business of my company, is to improve the competitiveness of U.S. industry through the appropriate application of electronic commerce. We have come to understand that effective electronic commerce can help to integrate supply chains, and thereby improve an industry's agility, market response time, and cost structure.

Implementing electronic commerce, however is risky because such implementation requires new business process whose success is tied to new computing and networking technologies. Changing business process is risky enough in its own right. It is even scarier if the underlying technologies lock users into particular vendors, if there is restricted availability of useful add-on products, or if opportunities for continuous improvement of systems are limited. All of these problems can be lessened in an open systems environment, but open systems require complex standards. So for both selfish and altruistic reasons, I hope you will join the effort for better standards development practices.

Structure of this Issue

I ordered these articles as I did in a deliberate fashion, as shown in table 1.

Table 1: Organization of the Issue

Title	Author	Topic			
		Context and Constraints	Frameworks for Improving Standards	Organizational Responses	Specific Technologies
Recommendations for the Global Information Highway: A Matter of Standards	Krechmer	X			

The Structure of IT Standardization	Oksala et.al.	X			
Technical Standards: Foundations for the Future	Krechmer	X			
Harness and Muzzles: Greed as Engine and Threat in the Standards Process	Farrell	X			
Second-best Practices for Interoperability	Libicki	X	X		
Human Behavior - Another Dimension of Standard Setting	Nielsen		X		
Standards Development for Information Technology: Best Practices for the United States	Morell and Stewart		X		
SEMI - The Standards-setting Organization Behind the Trade Show Association	Pucel			X	
The National Standards Systems Network	Walker			X	X
The IEEE Standards Automation System	Iorio			X	X

Improving Conformance and Interoperability Testing	Kindrick et. al				X
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The first four articles set out the historical, social and economic context of standardization:

- Recommendations for the Global Information Highway: A Matter of Standards (Krechmer)
- The Structure of IT Standardization (Oksala et.al.)
- Technical Standards: Foundations for the Future (Krechmer)
- Harness and Muzzles: Greed as Engine and Threat in the Standards Process (Farrell)

form one set of design constraints in which standards development takes place. The fifth article:

- Second-best Practices for Interoperability (Libicki)

presents a different set of design constraints, namely the complexity and rapid change of the standards environment.

"Second Best Practices for Interoperability" also serves as a bridge into the second set of articles, a group that presents various frameworks for improving standards development. The other members of this group are:

- Human Behavior - Another Dimension of Standard Setting (Nielsen)
- Standards Development for Information Technology: Best Practices for the United States (Morell and Stewart)

Nielsen provides a behavioral and human resource perspective on standards development. Morell and Stewart emphasize the application sound technology development practices such as requirements analysis, building a business case, valid metrics of progress, prototyping, testing, and project management.

The third group presents examples of specific organizational responses to the need to improve standards development.

- SEMI - The Standards-setting Organization Behind the Trade Show Association (Pucel)
- The National Standards Systems Network (Walker)
- The IEEE Standards Automation System (Iorio)

Pucel presents a comprehensive coordinated standards approach that can be taken by a trade association. Walker discusses the National Standards Systems Network, coordinated by ANSI and funded by the U.S. Government's Technology Reinvestment Project. Iorio tells us about IEEE's approach to streamlining standards development.

The final group of articles presents specific examples of the application of technology to improving standards development. The articles by Walker and Iorio also fit into this category. Walker discusses the Internet and the World Wide Web as methods of accessing

a variety standards and standards data bases. Iorio shows us how standards development can benefit from a combination of networking and SGML. The last article:

- Improving Conformance and Interoperability Testing (Kindrick, Sauter and Matthews)

shows us the advantages of automated conformance and interoperability testing.

Common Themes

While reading this collection of articles I was struck by the richness of connections among them. To spur debate and a dialogue I present a few of my favorites.

Continuum of Standards Complexity and Realistic Expectations

Several articles discuss how standardization is made difficult by the rapid pace of technological change in interconnected technologies. This problem should come as no surprise. Any design engineer, in any field, will tell you how hard it is to design systems that have both high complexity and short life-cycles. As the examples in this issue demonstrate, the standards which have these characteristics tend to involve telecommunications and networking.

Pucel's article stands in counterpoint to the notion of standards as a jumble of unmanageable complexity. In the SEMI world, a well defined (and relatively small) set of stakeholders are able to come together to manage standards development. They are able to take a strategic approach, starting with an analysis of long range trends in their industry and the technologies on which their industry depends. From there, the members of SEMI are able to determine standards priorities, establish committees, and drive the process down to the completion of a set of specific, timely standards.

Thus while no standard making is simple, there is a continuum of complexity that must be dealt with. When complexity is high, comprehensive solutions may be impossible. This is the theme in Libicki's paper. I believe he is right and that for many standards needs, success will require a series of partial improvements, each of which make the entire problem more tractable. If we are lucky the sum total of these solutions will result in a system (or more correctly a collection of systems) that is/are more susceptible to dramatic, paradigm breaking, improvements. Many possibilities for those partial solutions are presented across most of the articles in this issue.

Those partial solutions, however, can help improve any standards process, no matter how simple or complex it may be. SGML is useful for handling documents. Networking technology can allow more work to be done with less travel. Any standards committee will benefit from the right mix of qualified staff. High quality conformance testing, early in the standards development process, will always be useful. Careful consideration of industrial and technological trends is bound to lead to more appropriate standards. And so on. Thus while we must appreciate that the same solutions may have greater or lesser impacts depending on their context of application, we must also appreciate that practical, significant improvements are available for any standards setting.

Dissemination

A second major theme across these articles is the importance of dissemination. This theme appears along two dimensions:

- methods to make standards, and
- the results of standards making.

As examples of the emphasis on knowledge about making standards: Krechmer wishes that development engineers knew more about standards organizations and that there existed formal scholastic training for standards makers. Nielsen informs us that ANSI is beginning to provide such training, as does Pucel within the SEMI context.

In terms of knowledge about the content of standards, Pucel, Oksala, Walker, and Iorio all discuss the use of technologies such as SGML, networking and data bases to assure that proper knowledge is available at the right time to the right people. Pucel adds a layer by talking about the importance of training industry professionals in order to assure standards acceptance. Morell and Stewart sketch out a standards development life cycle in which dissemination plays a key role in terms of training, awareness and market building for the standard, and the technology transfer of testing tools.

Furthering the Discussion

Using this article as a starting point, the Editor-in-Chief of StandardView, Carl Cargill, has offered to facilitate a dialogue on best practices for standards. Comments and ideas should be sent to him via the Internet (carl.cargill@eng.sun.com). Carl will organize the responses and disseminate results via both the Internet and the pages of this magazine.

Thanks to my colleagues John Sauter and Jack White for comments on earlier drafts of this article.



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