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# INNOVATION AND LEGISLATION: STANDARDIZATION IN CONFLICT

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# Innovation and Legislation: Standardization in Conflict

*By Sherrie Bolin*

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# Executive Summary

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**O**n December 4-5, 2003 in Washington, DC, leaders in industry, government, and academia gathered to discuss the topic “Innovation and Legislation: Standardization in Conflict.”

While the title is intriguing, just what does it mean?

- (a) That standardization is being pulled in two directions, innovators and legislators on opposite ends of the rope
- (b) That standards developers are in conflict
- (c) That standards themselves are conflicting with each other
- (d) That there was yet another standards conference in an exotic, tropical location
- (e) That the person who chose the locations and dates of the last two conferences (December in Boston and Washington) is in clear need of an atlas and a Farmer’s Almanac

If you chose a,b,c, and e, congratulations! You clearly have a good understanding of the state of standardization today along with a general knowledge of winter weather patterns in the eastern United States. If you chose d, can I interest you in investing in beachfront property in Siberia?

The conference did address conflict in standardization from diverse points of view. Featuring speakers such as Tony Scott, CTO of General Motors, Miann Quddu, Director of Technology Enabling for Samsung, Toru Yamauchi of Japan’s Ministry of Economy, Trade, and Industry (METI), and John Podesta, former White House Chief of Staff for the Clinton Administration, along with representatives from industry, government, academia, and international and regional standards organizations, the conference treated invitation-only participants to four interactive panels:

- Technical Use of Standardization: Managing Innovation, Creating Technology, Managing Change
- The Role of Government in Standards: Social Legislation, Regulation, and Business User
- The Business of Standards: Creation, Destruction, and Preservation of IPR
- Internationalization and Standardization: Creation of National and International Markets

While each panel examined its respective issues, the nature of standardization means that many of those issues have impact across the board. As such, it was not surprising to find more visible concerns such as IPR issues or even standardization strategies discussed in many of the panels. Despite this fact and the diversity of those attending the conference, key issues were identified. At the top of the list of issues were:

- The need for government to facilitate harmonization of global standards
- The need for a more effective and flexible IPR solution that addresses the patent “hold up” problem
- Standards education and training for governments, professionals, and students
- Integration of public policy concerns into the standardization process
- The need for strategic standardization to occur at the top levels of organizations, whether they be corporations, government agencies, or standards setting organizations

Throughout the conference, panelists and participants exchanged ideas and opinions about where and how to resolve problems in the standardization system. Ultimately, it was concluded that standardization can be thought of as an ecosystem. One that, when carefully balanced, can foster innovation and serve as an incubator for emerging technology. As with all ecosystems, some conflict is necessary in order to sustain life and even to evolve. While some entities will die and others will adapt to meet changing conditions, the ecosystem itself will continue to survive. And it is the survival and improvement of the standardization ecosystem that these conferences seek to address.

Along with the conference, a book was produced that addresses many of the same issues. *The Standards Edge: Dynamic Tension™* includes an integrated compilation of articles from many of the conference speakers and leading experts in industry, academia, and government. The second in The Standards Edge™ series, this book features articles on strengthening the standardization system, government influence, intellectual property rights (IPR) solutions, strategic standardization, and cross-industry impact. Further information can be obtained by contacting the editor, Sherrie Bolin, at [sherrie@sbolin.com](mailto:sherrie@sbolin.com).

Together, the book and the conference strive to bring people together to discuss and strengthen the standardization system. Additional conferences in Europe and Asia designed to examine specific areas of standardization and additional books in The Standards Edge™ series are planned for later this year.

# Innovation and Legislation: Standardization in Conflict

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## Introduction

Is standardization in conflict, caught in a tug of war between innovation and legislation? Certainly the general perception is that innovation and standardization are in conflict; two mechanisms at opposite ends of the spectrum. But perhaps we shouldn't be so quick to accept this long held

assumption. After all, there was a time when the world assumed that blood letting was the cure to all maladies when it in fact diminished the health of already ill patients. Could we be making the same mistake with innovation and standardization by believing that total freedom without constraints is the best way to spur innovation? And what is the relationship between standardization and legislation? Is legislation pulling standardization too far in its own direction, in effect, constraining the positive effects it can have on the market or its potential as a stimulus for innovation? Then again, perhaps

legislation is providing too much freedom, taking a “look the other way” approach that is allowing standardization to slowly sink under its own internal battles and proliferating lawsuits?

These and other questions were the catalysts that brought together leading companies, government representatives, universities, and international and regional standards organizations in Washington, DC on December 4-5, 2003. The conference addressed areas including innovation, the role of government, business strategies, and globalization. Standardization served as the thread that weaved the conversations together to form some powerful ideas and even a few conclusions.

Participating in the panel discussions were leaders from organizations such as General Motors, NIST, Deere & Company, the US Government, Japan's Ministry of Economy, Trade, and Industry (METI),

Mitsubishi Research Institute, AOL Time Warner, ISO, IEC, OMG,<sup>1</sup> Nokia, the University of Colorado, and Georgetown University. For a complete list of speakers, please see Appendix A.

Sponsors of the conference included Sun Microsystems, Inc., JEDEC, Oracle Corporation, Georgetown University, Global Inventures, Samsung Semiconductor, and AOL Time Warner. All deserve congratulations for taking a hands-off approach when it came to speaker content, encouraging them to express their opinions even when they directly conflicted with those of the sponsors.

As with any conference, but particularly with this one, the most exceptional value could be found in the halls, at meals, and around the coffee station. It was during these times that true connections were made across boundaries that are not often crossed. A glance across the room would find users talking with universities, government talking with industry, and people of different nationalities talking with one another. More importantly, the conversations were animated—organizational party lines left at the door—as people truly started to connect through ideas. Plans were made for future cooperative efforts and even conferences. In fact, look for similar conferences this year in Europe and possibly Asia.

The conference was not the only thing that brought people together. A book entitled *The Standards Edge: Dynamic Tension*<sup>TM</sup> grew out of the ideas surrounding the conference. Containing a compilation of articles from leading experts in industry, government, and academia worldwide, including the majority of speakers at the conference, the book provides a more in depth examination of strengthening the standardization system, government influence, intellectual property rights (IPR) solutions, strategic standardization, and cross-industry impact.

The panel discussions, while divided into four distinct areas, actually touched on similar subjects across the board. For this reason, this paper examines the discussions and the findings of the speakers and the audience as a whole in four areas:

- Standardization and Innovation
- The Role of Government
- Changing Markets/Changing Strategies

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<sup>1</sup> ISO: International Organization for Standardization  
IEC: International Electrotechnical Commission  
OMG: Object Management Group

- Strengthening the System.

This paper, the conference, and *The Standards Edge: Dynamic Tension™* represent an opportunity to learn about the views and plans of leaders that will impact your organization, your nation, and your world. Most importantly, they are there to facilitate connections. And connections, after all, are what standardization is all about.

## Standardization and Innovation

People often perceive standards as innovation killers. As Ben Wu, Department of Commerce, stated in the previous conference, “Standards are a MEGO issue—My Eyes Glaze Over.” How then could something labeled as MEGO actually spur innovation? Perhaps it is because most don’t realize that “ICT standards are a process, not a thing. Standardization and innovation are a collection of activities that have phase relationships with each other that effectively amount to an ecology,” according to

*“If you can do all this, you will  
empower innovation by the freedom  
that comes from constraints.”  
—Rob Gingell, Chief Engineer,  
Sun Microsystems*

Rob Gingell, Vice President and Chief Engineer at Sun Microsystems. This ecology must be kept in balance to be effective and spur innovation. If standardization occurs too far ahead of the need, time will be spent focusing on the wrong processes and knowledge, which can actually scare away the innovators. If standardization occurs too late, the market will become

fragmented with competing innovations. There is an optimum range of chaos in front of the standard where innovation begins to occur and the life cycle for the technology evolves to meet marketplace needs. To maintain a healthy balance that fosters innovation, *existing* practices must be standardized, the effectiveness of standards must be measured by how they are consumed, and standards must offer enough flexibility so that companies who are already performing the practice to be codified can continue to do so. While it is important to strive for consensus, caution should be taken to ensure that the level of compromise is not so strong that an installed base for the standard does not exist. Finally, enforcement of the standard must be achieved by measuring whether conformance is established in a way that is useful to people. “If you can do all this, you will empower innovation by the freedom that comes from constraints,” declared Gingell. People are much more innovative with some framework than if they are given a blank sheet of paper and told to go create.

Ora Lassila, Nokia, questioned whether standardization could be used to build an ecosystem for new technologies. Using the ongoing development of the Semantic Web as a case study, he stated that standardization can be helpful to ongoing research because it clarifies an otherwise hard-to-understand technology, creates interest and publicity for an emerging technology, and it may resolve issues that are actually inhibiting research from going forward. Indeed, standardization can create new markets and serve as a strong foundation from which innovation flourishes. One look at the history of GSM, with its solid base of upfront standardization, proves that at least in some instances standardization can in fact enable innovation to grow, often at a faster pace. However, Lassila cautioned that standardization can also serve as a detriment to research and innovation. For example, standardizing too early may actually lead to inferior outcomes. In addition, it may impact innovation in ways that cannot be foreseen.

So, does standardization foster or stifle innovation? According to those at the conference, it has the potential to stimulate innovation if used correctly within the right time frame. Standardize too early and you end up with stale, unimaginative technologies. Standardize too late and you may have a lot of innovation, but the market will be so fragmented that it is unlikely that any innovation will be able to gain the market share necessary to survive. Of course, standardization also offers a unique opportunity for competitors, and sometimes users, to pool their ideas into a collective and possibly more creative solution. While too many minds can muddle the process unnecessarily, there are advantages to creating solutions with those who bring unique perspectives to the problem.

Perhaps the answer to this question has been evident all along in the examples found in history. Consider Eli Whitney's revolutionary innovations. While most recognize him as the inventor of the cotton gin, he is less well known for his more important invention—the mass production of interchangeable parts. Tasked with providing the US Government with 10,000 muskets within two years in 1797, he created this concept to help him deliver on his promise. Although the process started with guns, the idea quickly caught on, spawning the creation of the American System of Manufacturer. The standardization of parts, or components in technology terms, led to such innovations and capabilities as Henry Ford's automobile, the interstate system, and the mass, life-saving distribution of penicillin in World War II, among others. By freeing inventors from having to create all of the components from scratch, standardization allowed them to focus on the essential parts of their ideas and bring those ideas to market faster. Of course, the challenges and benefits of standardization still exist today. Sit down with Tony Scott, CTO of General Motor's Information



Systems and Services (IS&S) organization, and he'll tell you about his efforts to get his design engineers to use already existing gas caps instead of reinventing the wheel, so to speak. Scott feels that concentrating on gas caps or other areas that already have successful solutions simply for the sake of being creative actually inhibits the overall innovative process. Instead, he encourages his engineers to use existing standardized components when possible so that they can apply their energies to innovations in design that will truly make a difference to customers. After all, most cars have the same basic parts. It is the unique combination of those parts or the enhancement of the most essential parts that create market differentiation.

While historical and real life examples are essential in determining standardization's impact on innovation, studies can also help to resolve the issue. IDC found that standardization has increased the speed of innovation and enabled market entry by new companies in its survey of 340 companies, reporting that "Standardized platforms will continue to benefit the end user in terms of market choice, market expansion, and technology innovation."<sup>2</sup> In addition, the German Institute of

*"Standardized platforms will continue to benefit the end user in terms of market choice, market expansion, and technology innovation."  
—IDC, 2003*

Standards, DIN, found in its study that it is not sufficient for innovation to occur. Without an effective means to disseminate those advances, innovative products have little impact on the economy.<sup>3</sup>

So, what is the relationship between standardization and innovation? Is it truly in conflict? Perhaps the two are not so much in conflict, but are in a state of dynamic tension. A tension, that when managed properly, creates a healthy ecosystem that allows innovation and technologies to grow and flourish.

## Role of Government

The question is not *should* government be involved in standardization, but how. After all, as some of the largest customers in the world, not to mention ones tasked with ensuring the safety of its inhabitants along with fair business practices, strong international trade, and a healthy economy, forgetting to invite them to the party is probably not a wise decision. Rather, it would be more

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<sup>2</sup> IDC, 2001, Standardization: The Secret to IT Leverage, p. 2

<sup>3</sup> DIN German Institute for Standardization e. V.: 2000, Economic Benefits of Standardization, p. 20

advisable to not only invite them to the party, but to give specific instructions on when to arrive and what to bring.

So, the question is where, when, and to what level should government be involved in standardization. And should those roles be defined on a global basis, trying to make them generally applicable to all governments? Not an easy task when you consider that governments from around the world come imbued with their own cultures, rules, biases, and expectations from their citizens. The opinions of conference participants about governments' role in standardization varied as much as the snowflakes pelting the windows outside of the conference room during one of Washington's worst snow storms of the year. But the heat generated by the discussions inside was enough to melt away even the most entrenched icicles adorning the conference room windows. Discussions encompassed six areas: legislation, interoperability and infrastructure, globalization, architecture, intellectual property rights (IPR), and antitrust.

## LEGISLATION

There is no doubt that legislation impacts standardization. There are of course traditional uses along the lines of public safety, quality assurance, and even security. One only has to look as far as your own backyard or across the world to find poignant examples. In Europe, under the new European Directive, standards bodies are being asked to create standards that support regulations. The US issued Office of Management and Budget (OMB) Circular A-119, which requires government organizations to purchase products based on voluntary standards produced by formal standards development organizations (SDOs)—a decision that lends more credence and possibly more business to formal processes.

But it is not only government impacting standardization. Lately, there are distinct signs of standardization impacting legislation as governments increasingly recognize standardization as a vehicle to support domestic industries, inhibit or facilitate trade, and serve as an effective measurement for legislative conformance. As mentioned previously, the EU not only uses standardization as a tool for companies to prove that they conform to legislation, but in some cases it is looking to standardization to help create and drive new legislation. The US government now looks to industry not only to provide standards-based solutions, but to create standards in anticipation of government needs. The further you look into the intertwining of legislation and standardization, of government and standardization, the more complex the issues become.

Before defining the appropriate roles of government, it is beneficial to look at the overall risks and rewards of government involvement.

### **Risks**

During the conference, a US government representative asked what industry wants in terms of government involvement, specifically asking “If Congress stays out of it, will it be best for everybody?” Robert Noth, Manager of Engineering Standards for Deere & Company, spoke out in favor of some legislation when necessary, but stated that US legislation is currently too US focused and needs to be more international in scope. As a partial remedy, he encouraged government to enact legislation that changes the mandates of relevant government organizations to creating harmony with international standards. In addition, he cautioned legislators to base regulations on performance and avoid micromanaging or refining the design. Above all, Noth stressed that legislation needs to allow for flexibility to accommodate changes in the marketplace. Too often, legislation is based on market conditions that no longer apply. Businesses are tasked with conforming to that legislation, sometimes to the detriment of their businesses and the users it was designed to protect.

Jack Sheldon, Strategic Development Manager for IEC, expressed similar concerns, stating his belief that legislation tends to be longer term and more difficult to change than standards. From his point of view, standardization is much easier to deal with. Karl-Heinz Rosenbrock (Director-General of ETSI) believes that the European Directive is a preferable approach as legislation is not always consensus-based or practical.

Based on his experience, John Podesta, former Chief of Staff for the Clinton Administration and currently Visiting Professor of Law at Georgetown University, identified four risks associated with government involvement in standardization efforts:

- It can lock in obsolete technology
- Government driven standardization can be interpreted as non-tariff trade barriers
- It can reduce beneficial competition between multiple standards
- It can slow the standardization process down

### **Rewards**

Despite these risks, Podesta and others did see benefits in the right government involvement. For example, Podesta believes that public policy concerns need to be part of the standardization process

early on. He stated that “They (standards) are increasingly important from a public policy standpoint.” For example, IPV6 was a good technical solution for a technical problem. However, because the standards developers did not look at it from a public policy viewpoint, they did not recognize the privacy implications of a standard that called for assigning static IP addresses to enhance identification. The IETF eventually addressed the issue, but release and adoption of the

*“They (standards) are increasingly important from a public policy standpoint.”*

*—John Podesta, Former White House Chief of Staff, Clinton Administration*

standard was delayed until the issues were resolved.

Another area where public policy concerns are imminent is in wireless location tracking technologies. The concern is whether users will have control over who accesses their location information. In the end, it may be more expedient to address public policy concerns in the development stage of a standard as opposed to revising it later on. To accomplish this, Podesta recommends that

SSOs need to institutionalize public policy considerations into the standards setting process by implementing systematic ways to consider public policy consequences, encouraging the involvement of public interest organizations, and providing broader education for technologists themselves to encourage thinking about the social consequences of their standardization efforts. Standards bodies and their participants will especially need the help of outside sources as demands increase for standards to be internationally applicable. While standards developers may be able to foresee the public policy implications in their own country, predicting those implications on a global basis can be a daunting challenge. For further expansion of these ideas, see Chapter 15 in *The Standards Edge: Dynamic Tension*<sup>TM</sup>.

In evaluating standards that impact the public, Podesta explained that governments must take into consideration values, constitutional or rights implications, and the effect on and abilities of law enforcement in regards to the standard.

Public policy is not the only area where government is or should be playing a significant role in standardization. Conference participants and others who have communicated with their respective governments have called for them to take a role in interoperability and infrastructure, architecture, globalization, IPR, and antitrust issues. So while most participants strongly called for a hands off approach to government involvement, they are also looking to those same government organizations to help solve some very pressing issues.

## INTEROPERABILITY AND INFRASTRUCTURE

Interoperability remains a key issue that costs countries billions of dollars each year. In the U.S. automotive supply chain alone, interoperability problems, which often require that data files be repaired or reentered before they are shared, cost members at least \$1 billion per year.<sup>4</sup> Phillip Bond, Undersecretary of Technology for the US Department of Commerce, stated that consumers are asking government to help facilitate interoperability. For example, NIST has been authorized to work with the manufacturing industry to help develop and implement standards for electronic enterprise integration, a move that will remove a huge cost factor from the US economy, according to Bond. In addition, the medical records industry has approached the US government to increase interoperability so that medical records can be digitized, securely stored, and shared. Far from being just an industry concern, governments also have a high stake in interoperability. For example, US Homeland Security is relying on standards to deliver interoperability for first responders, security, and control systems for critical infrastructure. The US government is working to drive global standards in this area by working with other countries that have similar concerns.

Andrew Updegrove (Lucash, Gesmer & Updegrove) pointed out that it is not only information and communications technology (ICT) systems that need to interoperate, but government organizations as well. In accomplishing this, they may have to overcome their own policies and cultural barriers to sharing information. Updegrove used the Unocal case<sup>5</sup> as an example. In this situation, a US administrative law judge kicked out the case, stating that it belonged under the federal courts because it required in depth IPR analysis. Updegrove expressed his frustration that the case would have to start over again as it was not already in the US federal circuit. In addition, he discussed recent incidents in which the IRS had turned down two standards organizations because it decided that every member has to have exactly the same rights and the consortia must be able to say it represents the ENTIRE industry. Obviously, these are impossible criteria for any SSO to meet. Updegrove believes that incidents such as these demonstrate that government separation is causing problems and slowing down the standardization process. While no conclusions were reached in this area, Gail Levine, Deputy Assistant General Counsel for Policy Studies, Federal Trade Commission (FTC), explained that sometimes US government agencies are discouraged or even prevented from

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<sup>4</sup> National Institute of Standards & Technology (NIST): 1999, Interoperability Cost Analysis of the US Automotive Supply Chain

interacting with one another, often under the instructions of respecting one another's jurisdiction. However, just as within a company, marketing, engineering, sales, operations, and human resources must communicate in order for the company to succeed, perhaps it is time for government organizations to let goals drive their communications rather than the traditional lines of responsibilities.

In regards to the infrastructure of the standardization system, Bond believes that government has a role in providing the right setting for standards development and in working with other countries to strengthen the global standardization system and prevent competing national standards, which cause fragmentation. He believes that government should promote an open and voluntary approach to standardization. However, in order to set an environment that allows technology to flourish, it must remain technologically neutral. Just how should government set this environment? Some of those answers were discussed under IPR, antitrust, and legislation. Yet, throughout the conference, no one ever mentioned steps that the government could take to strengthen the standardization system as a whole. This is something that at least the US government has encouraged industry to provide for quite some time. A call to action from last year's conference was for industry to band together and approach government with specific needs for standardization. While this may have been done on an individual company basis, it certainly has not been accomplished from an industry standpoint. So, vendors and sellers, this is your opportunity—your wake up call. If you want government involved in standardization, if you want its help, now is the time to act.

## GLOBALIZATION

Globalization remains a central theme in the standards world.

Robert Noth, Deere & Company, emphasized that the current lack of harmonization around the world is the key challenge in standardization. As a company that does business in 160 countries, it is too cumbersome to meet

multiple standards and regulations around the world. Regulations should be built on internationally accepted standards and global acceptance should be one test everywhere. To require different tests in all 160 countries ultimately hurts the users, sometimes driving up a product's price by as much as

*Regulations should be built on internationally accepted standards and global acceptance should be one test everywhere.*

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<sup>5</sup> Unocal Case: A case alleging that Unocal misrepresented to a state standard setting organization that its technology was not proprietary and was in public domain. At the same time, it pursued patents for that very technology. As a result, consumers in California are paying higher gas prices.

\$10,000.00, according to Noth. Others agreed in principle with Noth, but stated that sometimes a one size fits all solution is not possible. All agreed that standards have to be driven towards identified goals and allow enough functionality in them to meet diverse needs.

Bond stated that the ultimate goal is global standardization. Unfortunately, nationalization and competition are fracturing the standardization system. This is particularly evident between the EU and the US. Bond compared the situation to two elephants fighting over a patch of grass. If the fighting persists, their actions will destroy the grass on which all entities are dependent upon for survival. Thus, the carefully balanced ecology that Gingell and Lassila referred to in their presentations would be destroyed and standardization would cease to be effective. Efforts are underway to resolve some of the regional and national differences in standardization between the EU and the US. These include an early warning system that alerts governments to developing standards that will impact their respective markets. Bond is hoping to expand this early warning system out to industry. This system is part of an EU/US initiative that strives to open up lines of communication on standardization between them. Of course, nationalism and competition are not limited to the Western world. China, for example, represents another potential for fragmentation. The country has already introduced its own encryption security standard and is considering creating its own definition of digital TV. In an effort to minimize fragmentation, Bond has been working with China and believes that it will opt for global standardization as the means to secure more jobs for its citizens—a priority for its government today. Finally, a core issue remains: the need to define what an international standard is under the Technical Barriers to Trade Agreement (TBTA). A clear definition would drive the achievement of global standards as everyone would ultimately be working towards a single goal at the higher levels.

Other countries, particularly developing countries, fear that using global standards will result in remuneration demands by richer countries such as the US. For example, Brazil has expressed this concern over adopting the HDTV standard. Therefore, in the interest of global standardization, Bond asked industry to think differently about licensing and funding models.

Finally, in an effort to further global standardization, the US Department of Commerce (DOC) has implemented a standards initiative, which will capture best practices, provide training for US International reps, and expand the early warning system. A report on the initiative will be ready in March 2004.

## ARCHITECTURE

Dale Hatfield, University of Colorado at Boulder and formerly of the Federal Communications Commission (FCC), called the audience's attention to the issue of public network architectures. An architecture is a definition of a framework (a broad outline) in which a detailed design can take place. Recent public network architectures include digital TV, E911 and wireless E911, and public safety radio systems. Who chooses the public architecture from which the standards making activities can proceed and the process used to make those choices can have serious public consequences, causing delays in implementation and creating an unfair playing field for suppliers of architecture components and users.

Choosing network architectures is becoming more difficult due to growing complexity, competition, and technology convergence. For example, wireless E911 is becoming increasingly important as people trade in their LAN lines for wireless—eliminating the ability to track the location of incoming emergency calls. An architecture that enables E911 must take into account 6000 different Public Safety Answering Points or PSAPs (where your call is routed to when you dial 911). These include wireless carriers, all the incumbent local exchange wire line carriers, the new emerging competing local exchange carriers, and equipment suppliers. In regards to competition, not only does it make consensus difficult, but there is the possibility that the companies involved in creating the architecture may not always choose interfaces that allow for future competition.

The current network architecture selection processes is producing architectures that are delayed at best and suboptimal at worst, according to Hatfield. E911 still has major problems, not the least of which is interoperability. Because these architectures are a matter of public concern, Hatfield calls for government involvement. He recommends that government facilitate voluntary agreements among stakeholders using informal processes and that it mandate legally binding agreements through a formal “rulemaking” process with stakeholder participation. Undertaking this role would be an effective step in ensuring that public network architectures are sound, fair, and completed on a more timely basis.

## INTELLECTUAL PROPERTY RIGHTS

Unresolved intellectual property rights (IPR) issues around the world are creating uncertainty that directly impacts standardization and thus market economies. Correspondingly, governments are becoming further involved in this issue whether simply through the proliferation of lawsuits in this



area or through policy making. For example, in Japan METI is setting the national IPR policy. In fact, Toru Yamauchi, director of Industrial Standards Research Office for METI, calls for concerned organizations around the world to address three areas:

- Ensure that incentives are offered to encourage patent holders to participate in standardization
- Stabilize patent pools based on standards
- Develop counter measures for the “hold up” problem (patent holders who claim excessive royalties for standardized technologies).

The key to remember is that this is a global issue. Intellectual property issues solved in one country will not resolve those same issues internationally and therefore will continue to negatively impact the market. Further, unless government is involved, IPR issues solved within an SSO so that a standard can move towards implementation does not prevent roadblocks from companies external to the standardization process.

Some SSOs have been working aggressively towards solving the IPR problem, at least for their own standards activities. ETSI<sup>6</sup>, for example, adopted a FRAND (Fair, Reasonable, and Non-Discriminatory) policy in accordance with its belief that everyone has the right to make money off of their intellectual property (IP). Those who don't want to license under FRAND terms are encouraged to disclose their IP early in the process. While they are not performing patent searches themselves, as Therese Hendricks proposed that SSOs take on in last year's conference, they have created a unique database featuring essential IP. To date, they have over 9,000 IP notifications submitted by 95 companies. One issue they haven't resolved is the definition of FRAND—a stumbling block that is proving difficult for SSOs throughout the world.

Ray Alderman, executive director of VITA,<sup>7</sup> takes a three-prong approach to IPR problems in his standards organization. First, he assumes that all patents are invalid. VITA will attempt to break any patent under question by showing prior art. If the patent can't be broken, the members decide whether to include the patented technology in the standard. Finally, VITA itself is planning to apply for patents. If anyone tries to capitalize on a VITA standard, VITA will sue them for violation of IPR.

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<sup>6</sup> ETSI: European Telecommunications Standards Institute

<sup>7</sup> VITA: VMEbus International Trade Association

Most panelists expressed concern over IPR. In fact, Deepak Kamlani, president and CEO of Global Inventures, pointed out that standardization exists as a vehicle for monetizing IPR. Perhaps this is not surprising since, according to Kamlani, US corporations alone spent \$193 billion on R&D. Companies need ways to monetize this investment and, indeed many of them are finding them. Consider that even four years ago, licensing revenues totaled over \$100 billion. IBM alone, in the late 1990s, generated \$1 billion in annual licensing revenue and \$10 billion in net earnings in the last ten years just from their intellectual property. And, with seven million patents issued annually around the world, according to Kamlani, it seems reasonable to estimate that the defense of those patents will increase drastically from the \$45 billion spent on prosecuting and maintaining patents in the US alone in 2001.

*Linda Garcia, Georgetown University, predicted that in the year 2000+ the big battle would be about IP in standards.*

Kamlani warned the audience that investment in IP creation and defense will accelerate exponentially and already sees corporations going after successful business models and asserting patent claims. In line with this, Kamlani told the audience to expect oligopolies to dominate over the next 10-20 years through the IP they have collected and that Wall Street will use IP to help evaluate companies. Finally, he predicts that RAND will threaten Royalty Free (RF). Already, he sees major companies refusing to

participate in SSOs if they have an RF policy. The concern and poignancy of IPR issues is not so surprising—Linda Garcia, Georgetown University, predicted that in the year 2000+ the big battle would be about intellectual property in standards. Ultimately, Alderman predicted that RAND itself will fail because it can't be overseen or enforced—especially with non-SSO participants.

## ANTITRUST

US Government has and will continue to be involved in antitrust issues. Gail Levine, US Federal Trade Commission (FTC) stated that the FTC uses Section II of the Sherman Act to determine whether action is antitrust. While these challenges are not common, they do show up in the “hold up”<sup>8</sup> problems. In order to prove antitrust, the FTC must show that first the company has market power in which it: (1) can charge more for its intellectual property after standardization but its royalties are lower than switching costs and, (2) can command significantly higher royalties than

before the standard when it had multiple competitors. If market power is proven, the FTC must also prove exclusionary conduct, meaning that the company gained market power through anticompetitive practices. For further information and intellectual property recommendations, see the report at <http://www.ftc.gov/reports/index.htm>. An additional report entitled “Innovation and Antitrust,” which covers standard setting issues, will be published in March 2004 at <http://www.ftc.gov>.

Obviously, as SSOs move forward in attempting to resolve their IPR issues, fears of antitrust abound. To date, there is no clear line that defines which behaviors will be deemed antitrust or which will not. This is of particular concern as some SSOs adopt an ex ante policy, requiring that organizations reveal their intellectual property early in the standards process. This lack of a clear definition will continue to cause chaos in the standardization process, creating numerous and possibly unnecessary lawsuits and leaving companies and SSOs with their hands tied, afraid to take a progressive step to resolve the issue.

## Changing Markets, Changing Strategies

### VALUE OF STANDARDS

Since this was a conference on standardization, it is not surprising that many of those attending touted their value. However, not all of the speakers or participants make their living from standardization. Podesta, for example, reported that we pay attention to standards because they serve as a powerful engine of economic growth, make markets operate more efficiently, spur competition, and reduce transaction costs. The result is more jobs, increased productivity, and better products. He stated that standards have a significant impact on economic trade and policy, citing that “About 80% of global merchandise trade is affected by standards and regulations that embody standards. And

*About 80% of global merchandise trade is affected by standards and regulations that embody*

standards influence approximately about \$200 billion in trade between Europe and the US alone.” Both Bond and Yamauchi stated that standards are increasingly important for trade. And most would agree with them—standards not only have the ability to facilitate global trade, but they also have the potential to serve

*standards.*

<sup>8</sup> “Hold up” problems: A situation in which patented IP is included in a standard and the owner of that patent demands licensing terms beyond what the SSO considers reasonable.

as barriers to trade when they are used to protect domestic industries.

From a perspective of an ITC vendor, Gingell explained that standards do four things: preserve economic interest, encourage competition by enabling consumers to lock in suppliers, reward risk taking, and enable companies to use assets effectively. In the end, when standards are homogenous at the networking level, they actually provide more choices by allowing heterogeneity at other levels. Again, Gingell’s “freedom of constraints” philosophy applies, albeit in a different context. This principle is found in many parts of our lives—the university system, for example. In the first few years of a university education, all students must fulfill basic requirements (i.e., composition, mathematics, basic science, etc.) so that they gain a solid understanding of these subjects, which they can apply in more specialized areas in their last few years of school. Without a solid foundation in the basic requirements, students would not be able to understand and apply the concepts learned in specialized courses such as engineering, marketing, business administration, and psychology. So, starting out with homogenous courses enables students to diverge into a more heterogeneous selection of courses later in their education just as starting out with homogenous networking components allows a more heterogeneous selection higher in the stack.

International standards have the ability to eliminate misinterpretation or misunderstanding across differing languages, help a buyer get what is expected from a supplier in another country, enhance understanding and agreement about technical parameters, and ultimately lead to trust, which is the basis of any business relationship, according to Sheldon. Crossing the language barrier, not to mention the cultural barrier, is a challenge that becomes more daunting as companies expand their markets globally. SSOs must not only deal with these factors successfully inside their own organizations as the participants themselves become more heterogeneous, but, in order for their standards to be adopted globally, they must help companies overcome these barriers in the market place.

*“We either have to change our products or change the rules that impact our products and that’s why we participate.”*

*—Robert Noth Deere & Company*

On a humanitarian note, Bond explained that standards can be the “rising tide that lifts all boats.” For example, standards are enabling many people to have access to phones for the first time in their

lives. Thanks to the widespread adoption of some wireless standards, countries that never laid the infrastructure for wire line phones can now offer wireless phone access at increasingly cheaper rates. Above all, Bond encouraged the conference participants to “think about the real benefit to make life better for the billions of people living on the planet.”

What value do users get out of standards? Robert Noth explained that Deere & Company views standardization as an evolution of product specifications. “Meeting customer expectations is the toughest thing we do,” Noth stated, and standards help them to not only meet those needs, but also to build brand reputation, achieve product differentiation, and satisfy investors. Standards are viewed as an essential part of the company strategy: “We either have to change our products or change the rules that impact our products and that’s why we participate.” Tony Scott expressed a belief similar to Noth’s, stating that GM is involved in external standards to influence emerging standards that will impact its business practices, future technology offerings, and customer expectations. Because it believes that businesses should have a stronger say in how technology standards develop, GM is becoming more involved in standards development areas that are not directly applicable to automotive standards. In addition, GM has managed to cut extensive costs through its internal

*After a concerted effort to standardize, GM has moved from 7200 to 2200 critical business systems and cut IT spending by over \$1 billion in just seven years.*

standardization efforts. In 1996, GM had the highest IT costs in terms of percentage of sales in the industry. After a concerted effort to standardize, GM has moved from 7200 to 2200 critical business systems and cut IT spending by over \$1 billion in just seven years. So, for those vendors who say that users don’t matter or care when it comes to standardization, better think

again. Perhaps consumers are still in the dark about standards (although even your average high school student can tell you that you need a wireless card that is 802.11G compliant), but large companies with large IT budgets understand the value of standardization and their participation in that process quite well. Even if they don’t participate in the process, many are becoming more standards savvy, demanding specific standards in their procurement contracts.

Some questioned whether standards always produce the best technical solution, pointing out GSM as an example. Sheldon explained that standards are not about the best technical solution but about business. Noth agreed, stating that standards are about meeting customer needs, about producing

saleable products. Even if 3G is not the best technical solution, it offers saleable convenience—the portability of a phone number so that customers can use that number anywhere.

## STRATEGIC STANDARDIZATION

Market conditions have obviously changed over the past few years and will continue to do so. There is more competition for fewer funds, requiring companies to increasingly show either differentiation or an economic advantage in their products. In his presentation, Alderman explained that markets are at high saturation levels and industries such as PCs, airlines, and color TVs are in survival mode. To survive and adapt to new market conditions, companies must play in either the niche (low volume, high margin) or commodity markets (high volume, low margin), according to Alderman. It is important to understand which market you play in to be able to understand your “value add.” For companies who compete in a commodity market, their primary “value add” is in their manufacturing processes. Niche players offer their primary value through intellectual contributions. It is equally

*Standards must be used more strategically, viewing them not as a technology tool, but as a business tool.*

important to understand which market your customers play in so that you can offer the value they need. For example, if a customer is in a niche market, they look to vendors to provide them with market advantage. If a customer competes in a commodity market, then their ultimate concern is price.

Regardless of which market a company is in, standards are always about new technologies. Those technologies can be offered to new or old customers through new or old applications, but standards are always about new technologies, explained Alderman. For a more in depth discussion of these concepts, read chapter 21 of *The Standards Edge: Dynamic Tension*<sup>TM</sup>.

How does all this apply to strategic standardization? In its simplest terms, commodity players gain significant price advantages as widely adopted standards drive down costs both for the consumer and for the vendor. Niche players can increase their intellectual “value add” by collaborating with others to achieve higher levels of innovation and speed time to market. The key is to use standardization in the right manner to complement your market and your strategies. Regardless of your market, standards can be used to influence it, according to both Kamlani and Cargill. For example, Kamlani explained that standards communities can be formed to create a new marketplace, generate new revenue opportunities, accelerate market demand, and disrupt a specific market. Carl Cargill, Director of Standards at Sun Microsystems, sees standards as a way to increase the overall market—this is especially essential when a company cannot increase the size of its market share. For example, if a

company can't capture 40% market share, it should band together with five other companies and each claim 8% market share of a larger market. After all, would you rather have 8% of a \$1 billion market or 8% of a \$10 billion market?

Standards must be used more strategically, viewing them not as a technology tool, but as a business tool. According to Kamlani, companies standardize to create new markets or disrupt their competitors' revenue stream with their own IP. In fact, his experience has shown that once a standard is widely adopted—defined here as at least 10% of the market share—it is guaranteed that a competing standard or product will emerge. So, while standards are viewed as a means for bringing companies or the market together, the standardization cycle also inherently contains a fragmentation mechanism. At the conference, many brought up the “problem of fragmentation.” After all, it seems to be directly contradictory to what standards are supposed to accomplish. But if Kamlani is right and fragmentation is indeed an inherent part of the overall process—perhaps a natural part of the ecosystem—than is it really undermining the standardization system as a whole or simply weeding out the weakest links, making the system stronger? This is an area that should be explored in future conferences.

*In setting a standards development and revision schedule, it is not only the vendors incorporating the changes that we have to consider, it is the willingness and speed of their customers to adopt those changes.*

Standardization at the corporate decision making level is still a rare find. At the moment, Kamlani sees standardization creeping in at the business unit level, although these efforts are often uncoordinated and fragmented. As companies begin to view their patents and IP as more strategic, Kamlani predicts that standardization will infiltrate more into corporate management practice.

Of course, some companies are ahead of the pack. Samsung, for example, believes standards help develop partnerships and better system solutions through collaboration and brainstorming. They understand that standards are not static, but rather an ongoing process that requires consistent participation. When major customers demand a standard, Samsung responds quickly to accommodate them. Consequently, standardization is a key element in Samsung's market strategy. Miann Quddu, Director of Technology Enabling at Samsung, reported that all new products at his company are required to go through the standardization process before being released to the market.

Why does Samsung place a high emphasis on standardization? First, because standards facilitate market acceptance and expand the markets in which their products can be sold. Second, because their customers have become well educated about standards and are now demanding standardization of products they purchase.

Strategic standardization isn't just about changing technologies or business strategies. It also involves a change of mindset by those who set company strategies, those who implement the strategies, and those who participate in standardization. Roger Marks of NIST stated that the new way of doing things doesn't just lie in new processes, but in the way the people themselves work and think. This is true. We can have all the technological interoperability possible but if we succumb to the same belief that hoarding information, even from our coworkers, is more beneficial, then we will have gained nothing. After all, opening up the gates—even those up in Redmond—does not guarantee that the information will flow. Even if security issues are successfully addressed so that information can flow in a controlled manner, business practices will not evolve without cultural changes to match our technological advancements.

In the end, the effectiveness of the standards themselves directly depends on the effectiveness of the SSOs and the companies that develop and use the standards. If too much standardization occurs, much of it will not be used. It is important to remember that the goal is mass implementation of a standard. Only through widespread implementation can we achieve interoperability—the true value of standards. If the schedule of standards development and revisions doesn't match the pace of businesses—striking a calculated balance between too slow and too fast—the revisions will not be adopted and the developing organization will end up fragmenting its own standard. In setting a standards development and revision schedule, it is not only the vendors incorporating the changes that we have to consider, it is the willingness and speed of their customers to adopt those changes.

Using standards strategically is a new concept for an old practice. But the rules in that practice are changing, just as our markets are. In the end, perhaps it is best to heed a warning by John Wayne (as passed on by Ray Alderman): “Life is hard. It's even harder when you're stupid.” In this era of changing markets and tough economic times, why make life harder on yourself? Standardize, standardize, standardize—strategically, that is.



## Strengthening the System

Challenges obviously abound in the standardization system, but so do the benefits. As Richard Soley, executive director of Object Management Group, stated, “The first 17,000 years of standards went well and then something went wrong in the 1980s.” So, what did go wrong and what can we do to fix it? To begin to answer this question—and it is only the beginning—it is helpful to take a closer look at a standards failure and a standards success.

Mike Smith of ISO opened the panel by asking “When is a standard not a standard?” The answer? “When it is not used.” Jack Sheldon illustrated the validity of this concept by sharing a story about the attempt to develop a global standard for plug and sockets. The process spanned 60 years and did indeed result in a few standards. Unfortunately, they were so complex and so much of a compromise that vendors never implemented them. What went wrong? Political and commercial interests intervened so that consensus was difficult to reach, protectionism came into play, experts pretended there were technical issues when in fact the real issues were political and commercial, they failed to understand the implications of globalization and device portability, and above all the participants forgot to take a long term view. These same problems exist in the standards development process today. The process is too complex, involves too many people or the wrong people, and takes too long to develop, according to Sheldon.

But standardization is not without its triumphant successes. Rosenbrock brought to attention the GSM standard, which is now successfully adopted and implemented in 170 countries, used by at least 400 network operators and one billion customers, and specified by more than 2800 ETSI deliverables. The key to its success can be found in a strong commitment by all interested parties, a good standardization process, the fact that frequency bands were made available early on, cooperation with other regions, and the possibility of strong competition. Used strategically, Rosenbrock views standards as a means to future proof technology. In the case of GSM, he believes that standardization contributed to GSM’s success because it is load sharing and thus cost sharing, creates a critical mass, brings economy of scale, and fights against technical barriers to trade, among others.

What needs to be done for the future of standardization? Kamalani recommends three things, the first two on the US front. First, he recommends that we stop looking at government-industry collaboration as a bad thing in the US. Second, we need a national standards policy that gets the

FTC, FCC, and industry involved in identifying where gaps are in the marketplace. Once the gaps have been identified, Kamlani suggests sponsoring the integration of standards through consortia or some other means. This is not an easy task to accomplish as resistance to standardization will have to be overcome. Globally, Kamlani promoted the need to create a standards ecosystem that includes education, training, and best practices. These areas are rarely addressed at the university, professional, or SSO level, resulting in a weak standardization ecosystem that seems to be fighting for survival.

## INFRASTRUCTURE

Changing the perception of standards and increasing the accountability of standards participants back to their companies should go a long way in reducing the time and money invested in producing useless standards.

Ultimately, improving the standardization infrastructure comes down to old versus new. The old way is slower and more deliberate. This way is appropriate for some situations such as changes to nuclear power plants or in low change, more stable industries such as petroleum distillation. However, in markets with rapid product cycles, the new way—which speeds up the standardization process to meet market needs in a more timely way—is more effective. It is no longer about SDOs vs.

Consortia. Now days, you can get something through INCITS in 12 weeks and most SDOs offer

*SSOs must look at their own models and find new ways to become funded and survive.*

similar capabilities. As Smith explained, organizations such as ISO offer an entire “standardization menu” that is designed to meet a wide variety of market needs. The difference between old and new comes down to the mindset of people and companies involved in standardization. To operate in the new way, that mindset has to change. For example, people have to move away from solving

standardization problems only at quarterly meetings. Instead, they need to use technology to solve problems and move the process forward in between meetings. “It is the planners that have to change, not the processes,” stated Cargill. As in the point made earlier about the need for cultural changes to keep pace with technological advances, the mindset of those developing standards must be flexible enough to make new processes work for them and to design new processes when the old ones are no longer useful.

But it is not just the mindset of standards developers that must change. It is equally important for company executives to take a new approach to standardization. Regardless of old or new, both ways

have inherent problems. These company leaders must view standardization as a management tool that ultimately reduces risks, as opposed to a technology tool, and use that tool strategically. Today, executives need to know who their standards people are, what they are accomplishing, and how that relates back to company goals. This, of course, means that standards have to be integrated into company goals and strategies every step of the way. According to Soley, this should include:

- Market identification—leverage a standard or define a new one
- Requirements analysis—does it need to be interoperable, portable, comply with existing standards
- Product definition—platform choice influenced by standards
- Product design—which standards should be used to design a product faster, maximize training, etc.
- Product Roll out—can awareness be built through a standards process

Of course, changes must also come from the SSOs themselves—not only in their processes and mindset, but in their business models. Bond reminded the audience that it is not all up to government. SSOs must look at their own models and find new ways to become funded and survive. And his advice makes sense. Just like any business, they must reinvent themselves under changing economic and market conditions. Podesta recommended that SSOs and industry make a concerted effort to educate government representatives at the higher levels. He explained that when industry does come to talk to representatives in Washington, DC, that it mainly focuses on short term issues and not longer term issues such as standardization. Government decision makers actually do want to learn about the longer term issues around technology and industry and often lack the resources to do so quickly and efficiently. The SSOs can take a stronger role in educating governments worldwide and encourage their members to do the same.

## SUSTAINABLE ARCHITECTURE

In creating and implementing standards in products, it is important to keep in mind the users. Tony Scott reminded the audience that repeatable architectures are critical and standards are a key driver in this area. He suggested that perhaps there is too much innovation and, thus, too much complexity. “Complexity is an enemy in this space,” he stated. For example, just for GM to deliver a simple Web application requires a minimum of 130 technologies. Instead he encourages standards and technology developers to foster reuse. Ultimately, he would like to see a sort of a Home Depot of software components, perhaps offered as a searchable directory through Web Services. Scott also lamented the lack of a quality standard, stating that “this is horrendous and a huge detriment to the industry.” He recommended that research be conducted on what is quality software from the running and

maintenance/change point of view—not just from the perception of product and technology developers. Quality can also be measured by conformance testing and Zevin, in her article “Testing: A Key to Building Trust and Confidence in IT Systems” Chapter 14 of *The Standards Edge: Dynamic Tension™*) discusses the necessity and paradigms of testing methods and certification.

## Conclusion: The Nuts and Bolts of the Problem

The main challenges identified in ICT standardization during this conference were the need for:

- improved global standardization
- appropriate government involvement in standardization according to industry definition (which needs further refinement)
- a solution or solutions that address the “hold up” problem in IPR in a flexible way
- a clearer definition of behaviors that can lead to antitrust allegations
- public policy concerns to be built into the standardization process
- better interoperability, not only between technologies but between people in industry, government, and standards setting organizations
- a more effective process for defining public network architectures
- research on standardization, including quality standards, and standardization education for professionals, students, and government
- strategic standardization to be practiced both inside companies and in the SSOs themselves

The challenges identified at this conference—in technology, in standardization, in our behaviors and cultures—can seem overwhelming at times. The suggested resolutions, when there were some, seem equally difficult to implement. To put things in perspective, Rob Gingell reminded the audience that the Telco infrastructure was perceived as infallible for the last 50 years. In reality, 40 years ago, the components were breaking on a regular basis. Overall, the components were sound but it was the relationship between those

*Fix the higher level problems  
and the lower level ones will sort  
themselves out as the market  
demands.*

components that made the system fallible. But that industry didn’t set out to fix every nut and bolt. It would have been an overwhelming, if not impossible, task. Instead, the industry concentrated on the higher level fixes, letting economic need drive changes at the lower level when they became critical.

I believe this is true with the ICT industry as well. It is the relationships—the connections—between the components that makes systems most fallible. And perhaps this is true even for the ICT standardization system as a whole. It is the relationships between the participants in an SSO, between those participants and their companies, between those companies and their customers, between

industry and government, and between the SSOs themselves that leave them most fallible. But it is also those relationships that provide their greatest strength. In going forward and tackling some of the challenges identified at this conference, maybe we should all heed Gingell's sage advice: Concentrate on the connections.

## **About *The Standards Edge: Dynamic Tension*<sup>TM</sup>**

*The Standards Edge: Dynamic Tension*<sup>TM</sup> contains an integrated collection of articles on standardization as both a business enabler and policy driver in national and international environments. Created for corporate executives, academics, and worldwide government agencies interested in ICT standardization, this book addresses the following topics:

- Strengthening the Standardization System
- Government Influence
- Intellectual Property Rights Solutions
- Strategic Standardization
- Cross-Industry Impact of Standardization

Containing articles from leaders such as Tony Scott, CTO of General Motors, Don Deutsch, Vice President of Standards Strategy and Architecture for Oracle Corporation, Toru Yamauchi, Director of Standards for Japan's METI, Erkki Liikanen, Directorate-General of the Enterprise and Information Society for the European Commission, and Phil Bond, Undersecretary of Technology for the US Department of Commerce, this edition represents a comprehensive collection of viewpoints, practical insight, and strategies on ICT standardization.

*The Standards Edge: Dynamic Tension*<sup>TM</sup> is the second book in The Standards Edge<sup>TM</sup> series. The first book, *The Standards Edge*<sup>TM</sup>, examined:

- How Standards are Created
- Maximizing Standards Investments
- Influencing IPR Policies
- Government Impact on Standardization
- Standards at Work

While each book in the series is funded by industry research grants, the funders have committed to allowing Bolin Communications editorial autonomy to ensure that objectivity is maintained. Future books will address other significant topics including standardization and education, grid computing, and eGovernment, as well as the annual book—produced in concert with the December standards conference—addressing significant global standardization concerns. Suggestions for future topics and potential authors can be sent to [sherrie@sbolin.com](mailto:sherrie@sbolin.com). To learn more about how to help sponsor this book or to request additional copies, please contact Bolin Communications.

## **About the Editor**

Sherrie Bolin is President and CEO of Bolin Communications, a strategic consulting firm specializing in standardization, strategic planning and implementation, and standardization communications strategies (making standards interesting). Bolin Communications has become the premier provider in standardization consultation, specializing in research and analysis reports, communications strategy designs and implementation, and training curriculum development and delivery. By emphasizing a business approach to standardization, Bolin Communications provides each client with a unique package of strategies, implementation plans, and communication methodologies designed to position them in the complex world of standardization.

Ms. Bolin is the creator and editor of The Standards Edge™ series. This series has become one of the most comprehensive resources on critical standards issues in the current environment and now serves as a significant guide to ICT industry leaders, academics, and representatives in the European Union, Asia, and the United States. Ms. Bolin is currently at work on additional books in The Standards Edge™ series, which examine separate strategic standardization issues.

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# Appendix A

## **Technical Use of Standardization: Managing Innovation, Creating Technology, Managing Change**

- Rob Gingell, Sun Microsystems, Inc.
- Ora Lassila, Nokia
- Tony Scott, General Motors
- Moderator: Maryfran Johnson, Computerworld

## **The Role of Government in Standards: Social Legislation, Regulation, and Business User**

- John Podesta, Former Chief of Staff, Clinton Administration
- Toru Yamauchi, Japan's Ministry of Economy, Trade, and Industry (METI)
- Dale Hatfield, University of Colorado at Berkeley and formerly of the US Federal Communications Commission (FCC)
- Gail Levine, Federal Trade Commission (FTC)
- Moderator: Maryfran Johnson, Computerworld

## **The Business of Standards: Creation, Destruction, and Preservation of IPR**

- Ray Alderman, VITA
- Deepak Kamlani, Global Inventures
- Miann Quddu, Samsung
- Carl Cargill, Sun Microsystems, Inc.
- Moderator: Don Deutsch, Oracle Corporation

## **Internationalization and Standardization: Creation of National and International Markets**

- Mike Smith, ISO
- Jack Sheldon, IEC
- Karl-Heinz Rosenbrock, ETSI
- Robert Noth, Deere & Company
- Moderator: Roger Martin, AOL Time Warner

## **Innovation and Legislation: Standardization in Conflict**