

CONFERENCE SUMMARY AND ANALYSIS
STANDARDIZATION: UNIFIER OR DIVIDER?

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**S T A N D A R D I Z A T I O N :
U N I F I E R O R D I V I D E R ?
E X E C U T I V E S U M M A R Y**



Does standardization ultimately serve as a unifier or as a divider? Is unification or division a better goal? These are some of the questions participants from government, industry, the legal profession, and academia gathered to address in Vancouver in December 2005. The conference, entitled “Standardization: Unifier or Divider?,” looked at standardization from an industrial policy tool standpoint to determine not only whether standardization unifies or divides, but under what circumstances it is best used for each of these goals.

The conference is part of a continuing series entitled “The Standards Edge.” This conference, “The Standards Edge: Unifier or Divider?”, was sponsored by Sun Microsystems; Microsoft; The Berkeley Center for Law & Technology at the University of California at Berkeley; the Phelps Centre for the Study of Government and Business at the University of British Columbia; The Economic Policy Research Center and the Shidler Center for Law, Commerce and Technology at the University of Washington; the Institute for Economic Policy Research at the University of Southern California; and Open Country. “The Standards Edge” series explores the impact of different issues in standardization by bringing together those who actively participate in and who are impacted by standardization to help strengthen the system. These conferences are accompanied by a series of books under the same name that explore and expand upon each conference theme. The books are underwritten by a grant from Sun Microsystems, which provides a much appreciated “hands off” approach that supports the books’ goal of providing an objective view of diverse perspectives. To download additional copies of this analysis or to order books in The Standards Edge series, please visit

<http://www.thebolingroup.com>. *The Standards Edge: Unifier or Divider?* will be available in Fall 2006.

The conference was based on the premise that standardization is essentially amoral. It is how it is used and its impact on areas such as industries, markets, and the public good that determine how we judge it. To determine how and when standardization unifies and when it divides, participants looked at four areas:

- the definition of open ICT standardization
- the need for uniformity or flexibility in standardization processes
- standardization's impact on global trade
- achieving balance between intellectual property rights and standardization

Though conference participants ranged from traditional large intellectual property (IP) holders to those who advocate open source, there was considerable agreement on overall principles governing standardization. At the heart of these agreements was the acknowledgment that standardization requires flexibility. A single solution applied across the standardization industry, whether defining open ICT standardization or setting a patent disclosure policy, will not save money nor will it allow for effectively meeting market needs. Instead, standardizers should draw from existing models, or components of those models, when appropriate to the situation. At other times, they will be better off creating unique solutions designed to meet the current market and technology needs.

What is most critical is the dialog that took place at the conference between individuals and organizations that are typically limited by industrial or geographical boundaries. The bringing together of diverse ideas that both better define the challenges facing standardization and propose viable solutions is invaluable. It is these conversations that form the basis for the conference and are analyzed in this paper. As always with "The Standards Edge" conferences, the intent is to build awareness across a diverse audience based on the belief that their input coupled with open dialog will ultimately serve as the best approach to strengthening standardization.

STANDARDIZATION: UNIFIER OR DIVIDER? CONFERENCE SUMMARY AND ANALYSIS

INTRODUCTION

Is standardization a unifier or divider? This is the question select experts from industry, government, academia, and even the user community worldwide gathered to deliberate in December 2005. At this highly focused conference in Vancouver, participants joined sponsors Sun Microsystems; Microsoft; The Berkeley Center for Law & Technology at the University of California at Berkeley; the Phelps Centre for the Study of Government and Business at the

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University of British Columbia; The Economic Policy Research Center and the Shidler Center for Law, Commerce and Technology at the University of Washington; the Institute for Economic Policy Research at the University of Southern California; and Open Country to take an in depth look at this question. The aim was not to provide a simple answer

of either unifier or of divider, but to explore how standardization is used as an industrial policy tool to unify and divide people, markets, industries, countries, and geopolitical regions. To expand upon this topic, a book entitled *The Standards Edge: Unifier or Divider?*¹ will be published that contains a collection of articles from conference speakers and other experts.

Standardization is often viewed as a technical tool, a quality assurance tool, and a consumer protection tool, among others. After years of exposure to marketing and business writing on the subject, most CIOs and even many CEOs now view standardization as a strategic tool.

Governments look to standards to boost national competitiveness, spur domestic markets, and

protect public good. The legal profession has found a niche in the areas of patent disputes, the disclosure policies of standards setting organizations (SSOs), and antitrust concerns. And even some in academia have recognized that standardization warrants serious studying (if only the funding would follow). In short, standardization is now in the spotlight. It is like the quiet little kid in the classroom corner happily scribbling out formulas for a unified field theory—while the rest of his peers are perfecting the aerodynamics of spit balls—who is suddenly recognized as the next Einstein. Standardization now commands the attention of everyone in the room. And everyone wants a say in how to structure, practice, and implement it. There are those who prefer to go back to the days of engineering-driven standards, to be left in peace to develop technological solutions that may quietly save the world. But with the recognition that standardization is a powerful tool that can build fortunes and redistribute market power, it is unlikely that relative newcomers to standardization will grow bored with its potential. Rather, newer types of participants such as lawyers, politicians, and business leaders are accustomed to changing the landscape to achieve desired ends. They will likely focus more closely on revising this tool to meet current and future needs. In 2001, when we started this conference series, the majority of attendees were professional standardizers. Just four years later, lawyers, business executives, and policy specialists make up a significant portion of the conference audience.

Those who specialize in standardization and even some in academia have been calling for this increased attention for years. Now that it is here, the standardization industry faces the challenge of bridging communication, cultural, and philosophical gaps. The diversity of participants can be a source of strength for standardization, a way to improve a system that was not keeping pace with technological change and market demands. However, the standardization industry will need to figure out how to incorporate new ideas into a system that leans towards traditions and protects the status quo. More importantly, its participants will need

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to determine not just how standardization can protect and further their own interests, but how they can change their business and political models to maximize the advantages of standardization as a whole. It is only by striking a balance between what is beneficial for the individual company, the overall standardization system, and the market that this system will thrive. There was agreement by most conference participants that standardization needs to improve in efficiency and effectiveness. Achieving these goals—no matter how you define them—requires change from the standardization system and from its influencers alike.

Where should these changes occur? This is the question we asked the participants, outlining four broad areas: definitions, processes, global trade, and intellectual property rights. Despite

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the diversity of participants—stemming from traditional, large patent holders to open source advocates—there was some agreement. Though there were also plenty of strong philosophical differences, the first step in reconciling these comes through dialog. This paper analyzes these discussions to draw

conclusions about how standardization is used as a unifier and/or divider and how it should progress in each of the four areas outlined in the conference. All discussions refer to information and communications technology (ICT) standardization, which has unique pressures caused by rapid technological advancement and ubiquitous connectivity requirements.

As Albert Einstein said, “Problems cannot be solved at the same level of awareness that created them.” The purpose of the conference and the book is to expand awareness—and hopefully create action—that will strengthen the ICT standardization industry worldwide. A theme inherent in both efforts is that standardization itself is amoral. It is how standardization is used in a given situation that determines whether it will have a positive or negative effect. By increasing awareness of what those effects might be, particularly in creating unification or division, those impacting standardization will be more likely to make strategic and sound decisions on how they treat, structure, and legislate it in the future.

WHAT'S IN A NAME?: DEFINING OPEN ICT STANDARDIZATION

In the world of standardization, most everything is defined to a minute detail. Processes are painstakingly written out, *Robert's Rules of Order* is frequently invoked, and I have personally observed a two-hour argument over where to place a comma in a standards document.

Therefore, it was a bit surprising when the majority of conference participants argued against a consistent and widely adopted definition of the word “open” in relation to ICT standardization. Reasons varied but can be summed up in two categories: futility and flexibility. Of course, there were those who also proposed definitions of open, which are worth exploring. As Larry Rosen, attorney and founding partner at Rosenlaw & Einschlag, argued, something that has such significant social and economic impact should be defined. Whether the attempt to create a universal definition is futile, necessary, or simply requires flexibility was a significant topic of debate among conference participants and speakers.

Futility: Tilting against Windmills

When Cervantes'² Alonso Quixano, a mild-mannered Spaniard in the seventeenth century, falls under the influence of chivalric tales, he transforms himself into the errant knight, Don Quixote. Rather than battling the inequities of the times however, a course that might have improved the lives of the non-ruling class, he chooses windmills as his foe. His deep absorption with stories of brave knights makes him view innocuous windmills as oppressive giants and leads him to fights with the windmills that will render him anything but chivalrous.

The battle to define “open” in regards to ICT standardization may be seen as similarly futile. Many of the conference participants viewed this

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exercise as, first, impossible to achieve given the variety of backgrounds and priorities of those that would have to agree upon a universal definition. Second, they felt universal agreement is

not necessary, nor would it add benefit to the standardization system. Some argued that participants in a given standardization activity understand what they are striving for, including the definition of open if that is a goal. Any disagreements in regards to definitions can be worked out among participants. Focusing energies to force agreement on a universal definition of “open” to strengthen standardization would be akin to Quixote’s battles to change the world via a war against windmills. Many of the conference participants believed that energies were better spent improving the standardization system in more fruitful ways. Finally, there was recognition that the word “open” has been co-opted by marketing efforts and used to brand everything from open source to proprietary software. Consumers have been successfully taught that “open” means “good” just as many believe the label “non fat” or “low carbs” on a box of cookies means they won’t gain weight, no matter how much they eat. But consumers, and more importantly CIOs, are recognizing the lack of substance behind this term. Investing time in creating a definition for a term that is decreasingly relevant to generating sales will render little benefits for the amount of work involved to achieve this goal.

Adding to the belief in the futility of defining “open” in terms of ICT standardization is the popularity of open source. Many, when they hear the word “open” today, think of the open source movement. And the majority of those people erroneously equate open source with free of charge. Open source does not necessarily mean available free of charge. Rather, those that use technology under an open source licensing agreement such as the General Public License (GPL)³ agree to certain conditions. For example, developers must release improvements on an open source technology under the same license, a requirement that allows technology improvements to build upon themselves. Developers and companies selling software based on open source may charge for their products as demonstrated by companies such as RedHat. With the confusion between the terms “open” and “open source,” some of the conference participants believed that it was time to either adopt another word to convey the concept of open ICT standardization, however that might be defined, or to avoid the issue all together by dropping the word “open” from the term “ICT standardization.”

Open to Change? Argument for Defining “Open ICT Standardization”

Of course, the popularity of the term “open” in regards to ICT warrants some exploration into how it is defined. Some conference participants felt that it is a critical word in standardization and others believed that, since it is in widespread use, it is more beneficial to define it than to ignore it. If governments and consumers need standards that are open, but they have no criteria with which to judge if a standard meets that requirement, then exploitation becomes a real danger. A company or an SSO can easily label a standard as “open,” giving false reassurance to the purchaser of a standards-based product. Similarly, attempts can be made to undermine a standard in the marketplace or argue against inclusion of specific IP in a standard based on arbitrary definitions. If the term “open” is a solid market requirement, than defining it becomes essential no matter how difficult the task. Of course, the true challenges would come after there is agreement on a definition. In that case, SSOs would need to change their individual definitions and potentially their processes, testing methods, and even publication rules. There would be a requirement for some to alter their entire business models in order to comply with the new standard. Similarly, companies would possibly need to change their standardization strategies, IP policies, and the ways they develop technology. In determining whether a universally accepted definition of “open” is a worthwhile goal, decision makers need to decide if “open” is a valued market requirement and whether defining it will strengthen the standardization system and its results.

What virtually all participants agreed upon was the need for flexibility. If the ICT industry is to adopt a definition of “open,” it should be flexible enough to accommodate diverse activities. Several of the panelists and speakers proposed definitions that could be built upon.

Mike Spring, professor at the University of Pittsburgh, proposed that the term “open” can be looked at from four dimensions: participation, process, property, and product. Of key concern are not only the decisions about who participates in the standardization activity or how that activity should be conducted, but what to standardize. Many consortia are formed to standardize a particular technology. Though more established consortia and traditional SDOs typically have some sort of defined processes for choosing what to standardize, these activities

can still be highly debated. Witness China's efforts to get WAPI⁴ into the ISO⁵ standardization process and the arguments against these efforts. In the current economy, a company that successfully standardizes its technology or has its technology included in a standard, particularly with an SSO that is efficient at marketing its standards, is more likely to achieve widespread adoption. It is also more likely to build an effective ecosystem of companies that will add to and support its technology. In evaluating whether a standard is open in the four

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areas proposed by Spring, it is also helpful to understand how decisions evolved. While most standards record versions and possibly voting results, there is little documentation of the daily decisions and debates that create the standard. Spring proposed that there should be a "standard for standards" that encapsulates how decisions are made and acts as a true living document. These living documents can

not only serve as a useful resource for evolving a standard or building upon it, especially when work is done outside of the original standards setting organization. They can also provide detailed information for future academic study that will hopefully increase our understanding of standardization and how to strengthen it. Though Spring provided a framework for defining open, he ultimately believes that creating standards more efficiently is of greater importance than the actual name used. It is the standard itself that matters, not how you got there. A good solid standard allows the market and technology to move forward and ultimately become invisible. In the end, these criteria, which focus on the results of a standard rather than the input, may be more important than the definition of a single word.

Despite arguments to the contrary, most attendees held to their belief that attempts to come up with a single, universally accepted definition of "open ICT standardization" are futile. There were arguments that if an attempt is made it must not only generate agreement among various cultural and philosophical differences, but also maintain a significant flexibility to encompass the diverse needs of activities that are part of "ICT standardization."

Flexibility as the Middle Ground

Rather than a universal definition of “open,” some proposed that a set of elements should be established that can be flexibly applied to different situations. For example, Stephane Tronchon, former legal counsel for ETSI, cited the efforts of the Global Standards Collaboration (GSC)⁶ to establish the fundamental elements of an open standard. Among these are that the standard is developed, approved, and maintained by a collaboration according to a transparent process. Materially affected and interested parties may not be excluded from the standardization process, and the standard must be available to the public under nondiscriminatory terms. The organization also called for the use of FRAND (Fair, Reasonable, and Non-Discriminatory) and permits royalty free but does not mandate it.

There are a plethora of open standards definitions in existence, many by some of the more well-known standards organizations ranging from ANSI to OASIS and by various governments (e.g., US Government, the Danish Government, the World Trade Organization). Most tend to avoid a single definition in favor of elements that should be included in an open standard. In perusing the different definitions, there are elements such as transparent processes and open participation that are common to many, though not all. Even if the definition of open could be reduced to a selection of common elements, or perhaps a requirement of meeting a specific number of a larger set of elements, the standardization community might find itself mired in a deeper layer of defining what those elements mean. How, for example, do you define “transparent” or “materially affected”? Though some conference participants favored one set of elements over another, most agreed that the elements should remain flexible enough to accommodate different situations. That flexibility needs to extend to the other approaches, such as open source, and other industries, such as entertainment and photography, that are now or will soon impact the ICT industry.

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A discussion of open standards would not be complete without input from the open source community. Though some argued that open source is not a standard but a development methodology, the community significantly impacts the information and communications technology industry and its views may significantly affect how standardization evolves. Larry Rosen asked whether an open standard is defined by the process, the result, or both. While there are clear open source principles,⁷ there is not a single place to go for the principles of open standards. Many conference participants agreed that understanding between the open source and the standardization communities needs to improve and certainly having a set of principles to reference can help to achieve that goal. However, the lack of universal principles defining open ICT standardization may also help the standardization system to accommodate open source needs more easily. Though both communities will need to work together to come up with acceptable working principles, even if done on a project-by-project basis, flexibility in definitions and principles may ultimately help them to work together more effectively.

Does the lack of an open ICT standardization definition ultimately mean that the effort to create one would be futile or that the standardization industry is more efficiently focused on improvements that bring the most benefits? Is this simply recognition that standardization requires a degree of flexibility that would be limited by a singular definition? Or, do those who impact standardization view it as a powerful strategic weapon that can be applied differently to each situation? If so, is it more advantageous to have a flexible definition of open where different elements can be invoked to support a particular technology or viewpoint? Regardless of how you answer these questions, the likelihood of a universal definition of ICT standardization is unlikely to be embraced in the near future if the reactions of the conference participants are a reliable indicator. And, perhaps it is not necessary to the ultimate effectiveness of standardization. After all, most of us seek happiness in our lives, yet often have very different definitions of what that entails. If openness is a main goal of standardization that remains defined by the situation, perhaps that flexibility will strengthen it in the long-term.

DOES ONE SIZE FIT ALL? THE NEED FOR SITUATIONAL STANDARDIZATION

The question “does one size fit all?” seems simplistic at first. In regards to standardization processes, is it possible to design and adopt a process that will effectively meet the needs of all standards setting organizations? Can that same process satisfy the requirements of all standards

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participants and their companies? What about consumers and the governments that represent them? Obviously, designing such a process would be an ambitious, if not impossible, task. If we cannot even agree upon a definition of “open,” how can we generate universal adoption of a “standard” standardization process? Though the task might seem

insurmountable, there are those who suggest that the benefits would outweigh the cost. A universally adopted standardization process may, for example, make participation easier. Participants could then have a single learning curve and apply the principles to all future standardization efforts. Decisions on which standards setting organizations to support would also become easier. Since all would have the same process, choosing which to invest in would take into account fewer elements that may then include membership fees, members, market reach, and IPR policies. Standardization would become less complex. This should, in theory, drive down costs and potentially make participation more possible for a wider variety of representatives. Thus, standardization might better represent the market. If standardization itself is purported to increase innovation by allowing companies to invent at a higher level, would universal standardization of the standards process yield similar results?

Though conference attendees were all supporters of standardization, their response to a one size fits all idea was firmly negative. Despite the differences in their backgrounds and philosophies, there was virtually no support for a universal, standardized process. Participants instead cited the need for situational standardization to meet market needs and alluded to advantages of practicing strategic standardization.

The Need for Situational Standardization

ICT standardization encompasses a wide variety of technologies and even supporting business processes. Developing a common process to standardize such diverse areas as wireless technologies and chips may be akin to forcing the milk and the space industry to align their design or manufacturing processes. While both industries can be said to ultimately serve people (one provides nutrition while the other delivers knowledge), the needs and their target markets are best served by different, customized processes. The industries need to keep in mind the need to interface (astronauts, for example, may rely on the milk industry for calcium, though the milk industry may need to provide this in a specific form for consumption in space), but the two industries will likely be more effective relying on processes best proven to meet their own needs. Similarly, standardization processes need to be flexible enough to support the diverse goals in ICT standardization. As Andy Updegrave, attorney at Gesmer Updegrave LLP, expressed, time and circumstances need to be taken into account. Not only must standards participants look at the requirements of the market and the technology in the current or near future, but they must at least try to anticipate the needs that will arise with future generations. In last year's conference,⁸ we focused on the development of the future generation of ICT technology in which a new level of automation, interoperability, and autonomy will be essential. Though we must strike a balance between standardizing too soon, there was agreement that we can attempt to accommodate future technological needs through current standardization activities.

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Situational does not just apply to the needs of the technology, but to those of the market as well. As Bob Noth, manager of engineering standards at Deere & Company and chairman of ANSI, pointed out, market requirements can differ significantly. For example, European markets tend to choose superior technologies for inclusion in standards. However, while these technologies may deliver the quality and performance valued by that market, it makes it

difficult to implement the same standard in developing countries. In these areas, their budgets often preclude acquiring the “best” technologies. Europeans or those in the US may prefer to include technologies in a standard, even if this raises the product cost. Those in developing countries, on the other hand, are more likely to sacrifice some performance if it will make the product more affordable. In addition, the best technology in one country or region where, for example, the infrastructure is well developed and reliable, may be inoperable or extremely inefficient in a country with little formal infrastructure. While a European product manager may be at a loss without a fully-loaded laptop, an African Masai warrior who lives a more migratory life as he guides his cattle to the best grazing land would benefit more from a light and mobile wireless communication device. The standards to make the components that best suit how these technologies are used may be vastly different and possibly require customized processes to achieve the specific market goals. We have a tendency to assume that one size fits all saves money, at least in terms of standardization participation. However, Noth proclaimed that, “One size fits all is the bane of our existence.” Taking this approach either results in adding costs to the product or a failure to meet market requirements. He believes that a standard is a unique version of a product specification and things need to be resolved on an application by application basis.

Situational standardization does not just apply to technology and market needs. It can also be advantageous for those that successfully use standardization as a strategic tool.

Strategic Standardization

Paul Vishny, attorney at Seyfarth Shaw LLP, explained that one size doesn’t even fit a single company, much less an entire industry. Why else would the list of standards setting organizations fill 25 pages?⁹ Companies must determine which process and forum are best for a product or technology, taking into account present and future development. They must then weigh their findings against the laws of competition and IP considerations, among other factors.

Standardization is often used strategically by companies, standards setting organizations, and governments if they are given the room to maneuver and use this tool to their best advantage. It is not uncommon to find a single company endorsing competing standards setting organizations where they often support contradictory policies. For example, a company may propose that RAND applies internationally in one SSO while, at the same time, stating that it is limited to domestic markets in another SSO. Their position changes according to how they perceive a standard will impact their market influence and sales. Standards setting organizations can also benefit from this flexibility, offering either a choice of processes or customizing practices to win new customers and meet their needs. Of course, government organizations can influence standardization strategically with funding, regulatory activity, legislation, or procurement guidelines to achieve their goals that might include protecting the public or stimulating nascent industries.

While some may bristle at the thought of using standardization as a strategic tool, believing that it is for the public good and not for generating competitive advantage, the two are not necessarily in opposition. If the market selects technologies based on widely adopted standards, or those that are anticipated to have high uptake, then companies have more

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incentive to include their technologies in standards. The public generally benefits through increased technological advancement and lower prices. Successfully including a technology in a standard depends on 1) a company's degree of influence within a single standards setting organization, 2) their ability to choose the right SSO and standards to back, or 3)

perhaps even offering the best licensing terms if ex ante negotiations become more prevalent. In some cases, it may even involve the best technology. Though de facto standardization can still lead to market dominance, potentially removing the incentive for at least these leaders to participate in de jure standardization, there is evidence that this is changing. Traditional de facto leaders such as Microsoft and Intel, for example, now participate heavily in standardization. The use of standardization for competitive advantage may ultimately benefit

the market and public good through the more widespread dissemination of technologies, encouragement of cooperation among competitors, and lowering of prices. A “one size fits all” approach can potentially diminish these benefits by limiting strategic behavior in the standardization process.

Though competitive behavior has its advantages, it can serve to undermine the standardization system, or any system, if used to extreme. If a company, or even a government, acts purely for its own advantage without regard to its affects on standardization as a whole, then standardization can ultimately fail. As stated previously, companies support competing standards setting organizations and occasionally competing standards. Since technology in particular often thrives on network effects, this sort of behavior can lead to such extreme market fragmentation that the market, or standardization, in a given area suffers. More often, it simply requires or motivates companies to either fund competing organizations until the likelihood of predicting the outcome increases or to apply their resources to battle the emergence of a competing standard. Some users posit that companies could put an end to this practice by simply refusing to fund competitive standards activities. But, knowing where to invest in order to ensure market relevance may require a certain, and perhaps impossible, degree of foresight. Companies may therefore deem it more strategic to fund competing activities until the emergence of a clear winner becomes more evident.

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It is not only ICT companies that must bet on standards battles, but CIOs and even consumers as well. As keynote speaker André Mendes, chief technology integration officer at the Public Broadcasting Service (PBS), stated, “If you make the wrong technology decision, it could bring down the company.” Most CIOs care little about how a standard was created or whether it is de facto or de jure. More important to these decision makers are questions such as: “Will this technology help to meet my goals? Will it continue to be supported? What kind of ecosystem will develop around it to add functionality?” Mendes stated that companies today

need to focus on differentiating at a higher level of abstraction. This suggestion may eliminate, or at least concentrate, some of the standards wars. He explained that in the marketplace there are 30-40 video server manufacturers. While all are MPEG compliant, they cannot play each other's files. From a CIO point of view, dealing with this incompatibility at such a low abstraction layer is a "nightmare." Maryfran Johnson, editor in chief and vice president of CIO Decisions Media Group at TechTarget, Inc., echoed Mendes' sentiments. Johnson's readers, who are mainly CIOs and technology executives, explained that rather than get involved in standards wars, these decision makers find more value in determining what technological investments their peers are making. They don't want to end up on the losing side of a technology battle by making wrong, possibly soon to be obsolete, investments. Standardization could ideally help them to make more effective decisions. However, under the current standardization system, spending time predicting or even influencing the outcome of numerous

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Thus, if standardization becomes too complex and fragmented due to the excessive use of strategic standardization, it may undermine its market influence as companies make technology decisions independent of standards activities or hold off investing in a certain technology altogether. The current battle between DVD proposed formats Blu-ray and HD-DVD is an excellent example. Forrester

Research predicts that if the standards war continues, adoption of a new DVD format will be delayed by two years as consumers wait for the outcome.¹⁰ As *The Economist* points out, "The war comes at a time when the very notion of having a physical product to hawk intangible media threatens to become anachronistic. In future, consumers will increasingly get content over networks, not on shiny disks."¹¹ Thus, the vendors may be so consumed in fighting the battle, they fail to recognize how to win the war or possibly even forget what they are fighting for.

Conference participants widely supported the need for situational standardization. But ensuring that this approach strengthens the standardization industry rather than undermines it requires a balanced approach. Those that capitalize on situational standardization must do so in a way that not only favors individual outcomes, but satisfies market needs. Just as a farmer must cultivate the soil and occasionally forgoe immediate profits to allow the field to rest and thus regenerate important nutrients, standardizers will benefit from behavior that increases the health of the overall system. Those that understand how to operate within this system strategically while promoting a healthy balance will likely be the ones to thrive even as situations change over time.

A Selection of Sizes?

If one size doesn't fit all, are there solutions that can allow strategic standardization but also simplify it enough to allow easier participation in standards setting and interpretation of results by technology decision makers? The clothing industry would not thrive, for example, if all garments truly were one size fits all. However, design, manufacturing, and purchasing are all facilitated by having standard sizes (at least within a specific country). Size does not dictate whether the garment is cotton or leather, conservative or trendy, affordable or expensive. It simply outlines specific dimensions of garments labeled with each size that everyone in the value chain can rely on.

...the standardization industry may be made stronger and more effective in the long run, while simultaneously enhancing strategic standardization abilities, if the challenges could be overcome to establish a component-based model.

Though the situation is more complex, could ICT standardization benefit from some form of standardization at the lower levels? Some

participants wondered whether a component-based approach might work. Could different procedures and practices currently in use or proposed be captured? These could then be available for setting up standards activities or policies. Rather than having to invent each area of standardization, participants could choose from among several different components and either implement them “as is” or customize them to their own needs. For example, a new

consortium could choose from a selection of IP disclosure policies or an existing SSO might take advantage of ex ante policies used by others. In theory, this flexible, component-based approach should make it less expensive to set up standards activities and potentially provide some legal safeguards. As an illustration, suppose that an ex ante policy in a US standards setting organization has proven effective for several years and that organization has sought guidance via a Department of Justice Business Review Letter. The SSO implementing that ex ante policy might not only save time and money in setting up ex ante discussions, but they might also have more confidence in that policy. The challenge would lie in how to select and make the different components accessible. An entirely new kind of standards war could erupt if companies or SSOs believe wide adoption of their processes would bring competitive advantage. On the other hand, SSOs might be loath to disclose or share their policies and procedures if it is likely to diminish their competitive advantage. Pricing, if the components were not available for free, would be a consideration along with methods for displaying and categorizing the information to facilitate use. In short, offering standardized components for standards activities would encounter many of the problems faced everyday by that industry. However, the standardization industry may be made stronger and more effective in the long run, while simultaneously enhancing strategic standardization abilities, if the challenges could be overcome to establish a component-based model.

A WORLD UNITED OR DIVIDED? STANDARDIZATION'S IMPACT ON GLOBAL TRADE

Since structure has consequences for power and wealth, Pete Suttmeier, professor at the University of Oregon, explained people will fight and strategize over structure. This is especially evident in global trade, where standardization has assumed a more significant role than in the past. Deverticalization of production, modularity, growth of global production networks, and technological fusion create a world that is much more dependent on standards, according to Suttmeier. Considering that the world Gross Domestic Product (GDP) was \$40.9 trillion in 2004,¹² the stakes are high. Standards, of course, don't influence all of this amount, but with approximately one million standards in existence according to Updegrave, and

approximately 70,000 standards developed in the telecom and computing/office machinery divisions between 1980-2004,¹³ they are likely to heavily influence a company's and a country's ability to conduct international business.

What is an International Standard?

Opinions on what constitutes an international standard vary depending on who you ask, when you ask, and the circumstances. A Google on the term “international standard” yields close to

...it was proposed that the ultimate measurement of a good standard is not the process, but the number of implementations.

six million hits. Some define international standards as only those adopted by ISO or IEC.¹⁴ Neil Gandal, professor at Tel Aviv University, reported that there is evidence of a move to international standards bodies according to recent studies, a trend that may show

support for this definition. Others argue that an international standard is one that achieves wide global acceptance.

The World Trade Organization's “Technical Barriers to Trade” (TBT)¹⁵ outlines principles for “globally accepted standards.” These include:

- Effectively respond to regulatory and market needs (in the global marketplace);
- Respond to scientific and technical developments in various countries;
- Not distort the market;
- Have no adverse effects on fair competition;
- Not stifle innovation and technological development;
- Not give preference to characteristics or requirements of specific countries or regions when different needs or interests exist in other countries or regions;
- Be performance based as opposed to design prescriptive.¹⁶

Many in the conference used TBT as a jumping off point to discuss the issue. However, participants such as Jim Thomas, president of ASTM International, argued that an international standard is one based on broad-based application. Simply complying to a set of principles does

not mean a standard will gain international market acceptance. This corresponds with discussions in both this and previous conferences in which it was proposed that the ultimate measurement of a good standard is not the process, but the number of implementations. After all, a standard that is adopted by only one or two companies, or that achieves low market acceptance, produces few benefits. This is especially true in the ICT industry where network effects are increasingly important.

A Changing Landscape

A standard does not have to be “international” to impact global trade. If a specific standard is required in government procurements, defined as a way to meet regulations, or even simply preferred by the majority of the population in a large market such as that of the EU, China, or the US, it is likely to have substantial financial impact. Large markets can make individual company compliance with a given standard worthwhile. Standards, like most business decisions, come down to a cost-benefit analysis. As more governments recognize the power of standardization and more countries gain influence in the system, the competitive landscape for standardization is changing.

While profiting in the short-term, extensively using standardization as a technical barrier to trade may make the system ineffectual, causing consumers to lose trust in the system and motivating companies to move to new methods of coordination.

Governmental Influence

Governments have long recognized the value of standards to protect public well-being such as those that monitor working conditions or food production techniques. But standardization can also be used by governments to protect local markets, stimulate nascent industries, and promote domestic companies abroad. Their influence at the policy and regulatory level, and their willingness to become more involved in standardization issues, signals the importance that this tool is gaining. The US, for example, has an early warning system that signals the government when standards are used as technical barriers to trade. Often run through its

foreign affairs staff, who receive training in standardization, this system provides a strong foundation that allows the US government to raise issues at the highest level, according to Ben Wu, former assistant secretary for technology policy at the US Department of Commerce. As pointed out by Jane Winn, professor at the University of Washington Law School, the European Union uses standardization in its New Approach. Under this Directive, the EU allows companies to prove regulatory compliance by demonstrating adherence to specific voluntary consensus standards. In China, the government is heavily involved in the development of its standardization system and strategy, including its international standardization policies.

Of course, with more government involvement comes the temptation or at least the risk to use standardization as a technical barrier to trade. The World Trade Organization’s “Technical Barrier to Trade” limits the ability of countries to exploit standardization in this way. Most participants believe that TBT is fairly effective in controlling this behavior and that difficulty

Countries such as China are bringing more weight into standardization, causing a disequilibrium that will force the system to adapt...

arises when countries violate the norms. Just as when companies violate ethical expectations or exploit policy ambiguities in a single SSO setting, a country’s failure to honor its agreement can tilt the market in its favor. However, it also weakens the standardization system as a whole. While profiting in the short-term, extensively using standardization as a technical

barrier to trade may make the system ineffectual, causing consumers to lose trust in the system and motivating companies to move to new methods of coordination, such as Joint Technical Agreement, that perhaps are not as open or market relevant as standards.

Tipping the Scale

The US and EU have traditionally dominated the standardization system. As standardization increases in importance, more countries and their companies are investing in this system. This investment is shifting the way standards are viewed, created, and measured. While there

typically has been focus on balancing the scales between the EU and the US, this is no longer realistic. Countries such as China are bringing more weight into standardization, causing a disequilibrium that will force the system to adapt (much as it has required China to adapt in recent years).

Of most significance in the minds of the conference participants was the growing influence of China on the standardization system. International trade experts have long forecasted the power of China's large consumer population. According to Qingsong Zhang who represented Sai Yang, director for the Center of KeHuan at the KeHuan Science & Technology Development Corp Limited, China's contribution to GDP increase is 14%, second only to the US at 20%. With statistics showing that every year China suffers trade losses in tens of billions of dollars because of standard related disputes and differences, according to Zhong, it is no wonder that China is becoming more involved in international standardization.

The evolution of the WAPI standard and its submission to ISO by China perhaps best illustrates China's growing power and the changing landscape in standardization. Opponents consider WAPI to be in direct competition with IEEE's 802.11 standard and argue that this effort will fragment the market unnecessarily. Others take a more tactical approach, stating that ISO procedures were not followed. Proponents argue that it is a good alternative solution and that China is simply practicing strategic standardization to take advantage of the economic benefits of its large consumer market. Originally, the standard was to be a requirement for all relevant imports and could be accessed only through specific Chinese companies. As evidence that international standardization may be working, the Chinese have reportedly altered this policy in its efforts to gain ISO approval.¹⁷ The WAPI standard will now be available to companies outside of China, allowing competition on a more global level, especially if China decides to require WAPI in its procurements. Whether China's efforts in this area ultimately cause fragmentation to the market's detriment or strengthen it by providing an alternative solution remains to be seen.

China has moved from adapting and adopting international standards to influencing them. China's new standardization system, according to Zhong, will strive to balance the roles of government and industrial organizations. Drawing from both the US and EU standardization systems, China is developing its own way of incorporating government technical regulations and introducing a voluntary standardization system. The participants from China cautioned that their system is still evolving and to reserve judgment until further development has occurred. Regardless of how the status quo leaders in standardization judge China's system thus far, the conference participants at least demonstrated a willingness to try to understand and work with this new standardization power. If they truly support the idea of situational standardization and the use of this tool strategically, then those participants are taking the right approach. As the global economy changes, perhaps other countries or regions will also gain power. For example, India may take on a more substantial role or developing countries may create regional standards blocks. Those that accept that standardization will evolve as technological and market needs change will be adept at adjusting to and operating in a changed environment.

International institutional mechanisms available for managing conflict in standardization are imperfect at best, according to Suttmeier. As a result of the global economic and technological changes, the appearance of new entrants, and the shifting strategies of countries such as China, international standardization issues are likely to remain highly contentious. Certainly more research and empirical evidence as to what makes international standardization succeed, how that success should be measured, and the economics behind it all may help stimulate solutions. Near the end of the conference, we asked roundtables to convene to discuss the key findings and possible solutions for each of the conference topics. While the roundtable on global trade did not put forward solutions, they proposed three important issues to consider if we assume that standardization promotes global trade. These were:

- To come up with the right framework for analysis
- To determine to what extent the WTO TBT and framework generally and adequately address the issues of global trade
- Since the global community consists of groups with different processes, standards processes need ways to recognize these differences to promote global trade

This list, though brief, provides a good starting point for analyzing and improving standardization's impact on global trade. While international standardization may indeed remain highly conflictive in the near future, consideration and dialog on issues such as these are likely to generate adaptable solutions that result in a healthier standardization system in the long run.

BALANCING ACT: MANAGING INTELLECTUAL PROPERTY RIGHTS IN STANDARDIZATION

The management, disclosure, and licensing of intellectual property rights in standardization is a contentious issue. Though people differ on how this should be handled, it is rare to find anyone that believes that IP is not a critical part of standardization. Patents were originally about rewarding and encouraging innovation. Today, the act of filing patent applications seems to be as much about building up an IP arsenal to protect a company from later lawsuits or to facilitating beneficial cross-licensing deals as it is about adding creatively to the market. With a two-thirds increase in the number of patents and an approximate doubling of patent lawsuits in the last decade, the issue is demanding more attention from SSOs, legislatures, and businesses.¹⁸

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In addressing the challenges found at the intersection of IP and standardization, we need to ask ourselves some essential questions. How can we strike a balance that still rewards innovation without

undermining it? Is there a way to motivate inventors to not only create but productize their innovations while balancing public good? Is there substantive proof that royalties generated from patents yield the highest profit potential for individual companies? After all, since patents limit exposure and use to other companies, extremely restrictive or cost prohibitive licenses may prevent an ecosystem or technological advancements from developing. This could negatively impact the original innovator's sales. Or, do we need to consider new mechanisms

for balancing the needs of innovators, implementers, and users? As technology changes and becomes more dependent on network effects, we need to consider whether exclusivity and the promise of licensing fees is the most effective way to reward innovation. Or, will innovators find greater rewards, perhaps in terms of increased market share or profits, through the sharing of IP?

Currently, as reflected in this conference, most thinking is still along the lines of working with the current IP system rather than creating completely new mechanisms. Participants focused on three areas: challenges to the current system, licensing models, and disclosure policies.

Challenges to the Current System

The conference participants discussed two general problems that are contributing to the IP in standardization challenge that cannot be solved solely by SSOs. The first is the increasing number of patent applications and approved patents. The US Patent and Trademark Office (PTO) alone now has a backlog of 500,000 patent applications, which is expected to double by 2010. More importantly, it is estimated that just 10% of patents approved have “economic worth,” according to *The Economist*.¹⁹ Joe Miller explained that participants should not take any patent system for granted. Instead, we should recognize that the current patenting system is a problem with which participants need to be involved.

Of course, just as companies contribute to fragmenting the market by investing in competing SSOs and standards, they also add to the problem by patenting IP that adds little or no value to technological advancement. Someone, after all, is filing all those patent applications that are causing a backlog. Most larger companies rely on cross-licensing deals, so having a large number of patents with which to negotiate obviously brings competitive advantage. But, these same companies are also suffering from the drawbacks of such a system. Novell, for example, spent over \$15 million to purchase e-commerce patents through a dotcom bankruptcy auction. According to Joseph LaSala of Novell, they did so in order to ensure that the patents could not

later be used against Novell or the ICT industry.²⁰ Smaller companies cannot afford this strategy and thus have little bargaining power if they are accused of patent infringement. Adding to this problem are companies that purchase patents purely for the purpose of exploiting them. Sometimes known as patent trolls, these companies make their money not from innovation but from enforcing their patents, often after they have been implemented in a popular market product. Since patent lawsuits are costly and can often force a company to cease production until it can design around specific IP, most end up settling with the patent owner. Of course, some like Ray Alderman of VITA, choose to fight patents. When threatened with patent infringement, Alderman calls for prior art to help break the patent. While he has broken three patents in the last six months, which potentially saves his members money and may deter other companies from pursuing VITA down the line, it comes at a cost that not all companies or SSOs can afford. Alderman estimates that this strategy will cost between \$80,000 and \$250,000 annually. As with any business strategy adopted, companies need to weigh the costs against potential rewards.

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While participants acknowledged the problem of patent trolls and those outside an SSO holding patents, they agreed that focus currently needs to be on solving the problems within an SSO. These problems and their potential solutions centered on licensing models and SSO policies.

Licensing Models

Establishing a licensing model upfront for a standards setting activity or for the SSO as a whole has emerged as a partial solution to combating IP disputes in standardization.

Discussions among conference participants centered around two intellectual property licensing

models: (1) Royalty free (RF), which allows those implementing a specific standard to use the intellectual property without charge, and (2) Reasonable and Non-Discriminatory (RAND), which stipulates that the IP must be licensed to all implementing a standard under these terms.

Royalty free has been adopted by prominent consortia such as W3C. Others apply RF in specific situations. Of significance is that many government organizations are starting to require RF. These include the Danish National IT and Telecom Agency, Interoperable Delivery of European eGovernment Services to Public Administrations, Businesses and Citizens (IDABC), and the State of Massachusetts. It simplifies processes in some ways as terms can be more clearly and easily defined upfront. Some theorize that it stimulates market adoption and rewards innovators with a first mover advantage. Others point out that first, there is no proof that royalties actually increase consumer cost. Second, that it is often the features rather than the whether there are royalties that influence market acceptance. For example, Kent Baker of Qualcomm explained that there are both RF and royalty versions of memory cards for iPods. According to Baker, the memory cards with royalties attached, which have higher performance, sell five times more than the RF version.

RAND, however, is still favored by the majority of SSOs. While presenting more implementation challenges, not the least of which is defining licensing terms that are “reasonable,” it does purport to strike more of a balance between rewarding IP holders and supporting public good and technological advancement. However, allowing royalties, which may be agreed upon without knowledge of other IP in a standard, can result in excessive royalties that stymie market adoption. For example, Robert Barr, executive director at the Berkeley Center for Law & Technology, pointed out that a jury awarded Symbol 6% royalties in the 802.11 standard. Six percent royalties does not perhaps seem excessive for a standard. But since there are over 100 other entrants in that standard, the awarding of royalties could drive up price past market tolerance. The difficulties that come with RAND don’t necessarily mean that it should be abandoned, but that we need to think about how it is implemented and strive to address some of its challenges.

Unlike previous conferences, there was little discussion or contention about the merits of each licensing model despite the fact that participants ranged from large IP holder companies to those who benefit more from RF conditions. And there was no mention of applying more traditional royalties to IP in standards. Instead, as with the rest of the conference, there was more agreement on the need for customized and flexible approaches to the IP problem in standardization. This change brings hope for the standardization industry as a whole. It illustrates that either the different camps are placing the need to create a workable solution above their individual goals or they recognize that a flexible approach will produce greater benefits for them individually in the long run. Regardless of the reason, it enabled participants to focus on problems and potential solutions facing the standardization industry beyond that of selecting an IP licensing model.

Disclosure Policies

Robert Barr outlined three issues for disclosure: rules for disclosure of patents to SSOs, rules for disclosure of licensing terms, and the standards approval process in response to disclosure. These accurately describe the situation in which most SSOs are struggling with today.

The rules for the disclosure of patents in a standards process have been at the forefront with notorious cases such as the Rambus debacle. At issue are such questions as when do patents have to be disclosed in the standards setting process, is disclosure based on the individual participant's knowledge or the company that participant is representing, and is designing around a patent that has been disclosed anti-competitive behavior? Many SSOs provide vague guidelines that can be interpreted ambiguously. This leaves room for exploitation by patent holders once a standard is adopted, especially if it receives wide market acceptance. Resistance by some SSOs is based on fear of lawsuits. Others adopt the philosophy of "don't knowing is better." In the US, known patent infringement can incur treble damages. But taking this ambiguous approach to patents in standardization may not be optimal given the growing incidence of patent exploitation and infringement accusations. Perhaps this is where the discussion under "one size fits all" can help. If the component approach advocated for

standardization setting practices and possibly measurement can be applied to SSO intellectual property policies, this at least gives them a choice of patent disclosure policies from which to start. In some cases, these will have been proven over time and can provide some degree of reassurance that the policies are both effective and legally sound.

If an SSO requires patent disclosure before the standardization setting process has progressed too far, then they may also turn to ex ante discussions. These discussions and possibly agreements define the licensing terms and conditions for that IP with which the standards implementers must agree. The main argument against ex ante has been fear of antitrust allegations. However, Chairman Majoras announced at the conference “Standardization and

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the Law: Developing the Golden Mean for Global Trade” in September 2005²¹ that there is no per se condemnation. She believes that price transparency can actually increase competition among rival technologies. This announcement has provided the reassurance some SSOs needed to move ahead with ex ante negotiations. Others, however, are still

holding back. They believe that while they may not be subject to US government antitrust allegations, they would still remain vulnerable to private lawsuits.

Despite the possible risks, other participants argued that ex ante is good for competition. Joe Miller, for example, believes that disclosing the terms and conditions of an IP while discussing what to include in a standard makes sense because it is a competitive process. There are, after all, few of us who would purchase any technology or service without knowing the conditions upfront. Some participants questioned why standards setting should be any different. Taking into account all of the information before making a decision on whether to include specific IP is part of a good business principle of conducting a cost-benefit analysis.

There are two main issues with ex ante from the IP holders’ standpoint. First, disclosing terms and conditions upfront, before an IP is included in a standard, may result in unwanted

competition among competing IP holders. If the standards setters are presented with similar IP that solve the same problem, then they are likely to choose the IP with more favorable terms and conditions. Large IP holders who make the majority of their profits off royalties may potentially suffer. This assumes that making larger royalties will benefit them more in the long run than either making smaller royalties off of increased market adoption or, if royalty free conditions are offered, capitalizing on first mover advantage. The second issue for IP holders is the potential difficulty of setting royalties in advance. Some larger IP holders proclaimed that their licensing models are exceedingly complex and cannot be force fit into ex ante negotiations. Others in similar situations stated that while there licensing is also complex, they were able to successfully explain it to concerned SSOs thus allowing the standardization work to move forward.

Finally, there was the question of the standards approval process in response to disclosure of either patents, licensing terms, or both. Participants did not spend much time on this question. Just as licensing models used to rule most debates, discussions over whether and/or how to implement ex ante discussions now consume the majority of IP discussions. At issue might be questions such as: Do we include known patents in a standard or do we look for alternative solutions? If ex ante is allowed and there are competing patents, how do we choose the best one for the standard? Do we have established criteria that all of the SSO participants should look at such as price, restrictions, and value-add? Or, should the participants setting the standard develop their own decision criteria? These are questions that will need to be addressed as discussions move forward. Perhaps as thoughts become more concrete and standardizers gain additional experience with ex ante, the component model might offer SSOs some options.

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Licensing, policies, patent trolls . . . all are IP issues that standardizers and governments are struggling with. While the solutions are not always clear at this point, the need to expand our thinking about how to manage IP is. Wenwen Li, engineer at the China National Institute of

Standardization, for example, suggested that, in China, they look at intellectual property as a feature of a standard. They base their decision on whether to include a specific IP, especially one with royalties, on whether it will add value. Participants in that decision include not only lawyers, but engineers, business people, and government representatives.

Noted author Don Tapscott²² says, “This is about how to kill your competitor. And you kill your competitor these days by identifying the need to innovate yourself, but also opening up that innovation; by owning IP, but also sharing IP.”²³ The strategy of hoarding IP and mining it exclusively while generating significant profits may no longer be the most effective in an era of technology where interoperability and connectivity are becoming more essential. History has always shown how marketing giants were taken down when they refused to adapt to new

At issue is not whether these innovators should be rewarded as technology advances and market needs change, but how.

market conditions. The railroad sector in the transportation industry is but one example. But, we cannot realistically expect those that invest considerable resources in innovation to go unrewarded. Aside from ethical considerations, these

inventors would not be able to stay in business, eliminating the possibility of future contributions. At issue is not whether these innovators should be rewarded as technology advances and market needs change, but how. Since we are relying more on network effects and greater technological advancement can occur from sharing IP rather than hiding it, what rewards are appropriate for today’s and tomorrow’s inventors? How can we structure rewards that strike a balance between stimulating innovation and guaranteeing wide implementation? Between individual company profits and market needs? And between private industry and public good? These are questions that we need to address as we struggle to smooth the intersection between IP and standardization.

CONCLUSION

Is standardization a unifier or divider? Most conference participants believe that it is ultimately a unifier. It did, after all, bring that diverse gathering together and conversations were never at

a lull. But, in reality, standardization can serve as both depending on the situation and how it is used. The act of unifying or of dividing is not inherently good or bad. Instead, it is the effect of an action that determines how we judge it.

During the conference, André Mendes of PBS proposed that one of the goals of all technologies is to become invisible. Illustrating this point, he asked, “What do we consider technology?” The answer, whatever didn’t exist while we were growing up. Most of us, for example, do not consider electricity or landline telephones technology. Children born today will be unlikely to consider the Web technology. Successful technologies evolve into standards, become ubiquitous, and then disappear from everyday consciousness, according to Mendes.

The act of unifying or of dividing is not inherently good or bad. Instead, it is the effect of an action that determines how we judge it.

ICT standardization should share the same goal. Those standards that become “invisible” are often the most useful. TCP/IP, HTTP, and XML are all invisible to the user. Your average Web user, for example, does not say, “I need to access a page on the Internet. I’d better make sure I have HTTP.” It works in the background and out of everyday consciousness for most people. As we discussed last year at the “Future Generation” conference and in *The Standards Edge: Future Generation*,²⁴ technologies are going to have to be more autonomous and interoperable with the rise in automation and connectivity demands. Standards will have to meet these same goals. Even if there are rival standards that are supported, which can divide the market, they will have to interoperate in a way that makes them invisible to be truly successful worldwide. If they cannot interoperate, consumers will either hesitate to invest or the market will choose a winning standard, thus creating unification and invisibility in the end.

Definitions, processes, IP policies, and global trade regulations are all areas that impact standardization. The conference participants, despite coming from companies with very different market strategies, all agreed on one thing: flexibility is the key to strengthening the standardization system. Resolving issues within standardization as a whole or within a single

SSO requires consideration of the circumstances, the market, the technologies in question, and what the future is likely to bring. Forcing a “standardized” approach on all ICT standardization efforts is akin to instructing those living in Bali to wear the same shoes as those in Alaska. The target markets and the users have very different needs and standardizers must have the freedom to develop the best approach to solve a given problem.

Adding the option of a component-based approach to standardization may be helpful. Standardizers could then choose from a given menu of policy and process options, for example, in designing their own approach to standardization. Or, they could create their own

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approaches from scratch. This idea is not new. It’s reflective of the buy vs. build vs. modify approach when it comes to acquiring technology.

We are in the first fifty years of the computing revolution, explained Mike Spring. It will take awhile to sort out how things should best progress, including ICT standardization. What is critical is that those impacting standardization continue to talk, exchange

ideas, and propose solutions to move forward. If they approach these discussions with the same level of open dialog that the conference participants exemplified, we will eventually alter the system to better meet our changing market needs.

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ENDNOTES

¹ Sherrie Bolin, ed., *The Standards Edge: Unifier or Divider* (Ann Arbor, MI: Sheridan Books, forthcoming), for further information please visit <http://www.thebolingroup.com>.

² **Miguel De Cervantes Saavedra**, *Don Quixote de La Mancha*, trans. Samuel Putnam (New York: Modern Library; 1998).

³ General Public License, <http://www.gnu.org/copyleft/gpl.html>.

⁴ WAPI: Wireless Authentication and Privacy Infrastructure, a local area network standard developed in China and submitted to ISO for consideration as an international standard.

⁵ International Organization for Standardization (ISO), <http://www.iso.org>.

⁶ Global Standards Collaboration, <http://www.gsc.etsi.org/>.

⁷ Open Source Principles: <http://www.opensource.org/docs/definition.php>.

⁸ “The Future Generation: Technical, Social, and Legislative Implications for Standardization,” a conference held at Sophia Antipolis, France, December 3-4, 2004; For a conference summary, see <http://www.thebolingroup.com>.

⁹ For a comprehensive list of standards setting organizations, see <http://www.consortiuminfo.org/links/>.

¹⁰ Ted Schadler, “Blu-ray Will Win A Pyrrhic Victory Over HD-DVD; Annoyance, Apathy, And Alternatives Will Keep Consumers Away,” quoted in “Standards wars Singin' the Blu's” *The Economist*, November 3, 2005,

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¹⁹ *Ibid.*, The US Patent and Trademark Office receives on average approximately 350,000 national and 50,000 international patent applications per year. US Patent Office, “United States and Australian Patent Offices Launch Pilot Project on International Search and Examination Services”, November 7, 2005,

<http://www.uspto.gov/web/offices/com/speeches/05-51.htm>.

²⁰ “SURVEY: PATENTS AND TECHNOLOGY; An open secret” *The Economist* October 20, 2005.

²¹ For a conference summary, see <http://www.thebolingroup.com>; For a text version of Chairman Majoras’ announcement, see Sherrie Bolin, ed., *The Standards Edge: Golden Mean* (Ann Arbor, MI: Sheridan Books, forthcoming).

²² Don Tapscott’s books include *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (New York: McGraw-Hill; 1997); and *Growing Up Digital: The Rise of the Net Generation* (New York: McGraw-Hill, 1999).

²³ “SURVEY: PATENTS AND TECHNOLOGY; An open secret,” *The Economist* October 20, 2005.

²⁴ Sherrie Bolin, ed., *The Standards Edge: Future Generation* (Ann Arbor, MI: Sheridan Books, 2005).