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FOR THE PEOPLE AND BY THE PEOPLE: A NEW PROPOSAL FOR DEFINING INDUSTRY STANDARDS IN COMPUTER SOFTWARE

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"The nicest thing about standards is that there are so many of them to choose from." Ken Olsen[1]

I. INTRODUCTION

For better or for worse, software standards have become a ubiquitous tool in the computer industry, as indispensable as an *O'Reilly* book,[2] but far more powerful in maintaining the direction of the market. Usually defined by standard-setting organizations ("SSO") comprised of corporations in a particular industry, software standards define many of the technologies users take for granted, from those used to navigate the Internet to those that govern how images are displayed on a screen.[3] Yet, the real question is not "what" defines a standard, but "who" defines it. Is it the government's duty to moderate the standardization of the industry through established agency mechanisms, as it does in other venues such as the Federal Trade Commission ("FTC") and Federal Communications Commission ("FCC")? Or should SSOs utilize their expertise and access to those on the cutting edge to make these determinations?

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[2] Published by O'Reilly Media, a computer consulting company founded by Tim O'Reilly, these books provide detailed explanations and tutorials for using most programming languages as well as popular software titles. A unique characteristic of each book is that the cover is adorned with a drawing of an animal, which is usually somewhat obscure like a flat-headed cat or Howler monkey. *See* O'Reilly Media Homepage, http://www.oreilly.com (last visited Nov. 28, 2006).

[3] *See* James Clark, *Technical Standards and Their Effects On E-Commerce Contracts: Beyond the Four Corners*, 59 BUS. LAW. 345, 346 n.2 (2003) (listing technologies owned by the SSO Internet Engineering Task Force that comprise the backbone of the Internet); *see* discussion of GIF patent *infra* Section II. A.

Perhaps it should be a marriage of the two, with governmental and administrative weight given to the decisions of these assemblies. Ultimately, software standards raise issues of determining how best "[t]o promote the Progress of Science and useful Arts,"[4] whether this duty should be left to the government or the people, and just how much, if any, cooperation should exist between the two.

This note proposes the creation of a federal SSO similar to existing federal agencies involved in standards adoption but with many of the policies and incentives of private SSOs. Section II provides an overview of the standard setting process and some of the advantages and disadvantages inherent in this process. Section III provides two recent examples of some of the dangers and issues surrounding software standards, particularly those faced by the SSO and users that pushed for them. Finally, Section IV outlines the proposed federal SSO and how it would improve the existing system. While this proposal is certainly not without its faults and shortcomings, the current standard setting is far too unstable considering the importance of the technology involved; this proposal is not designed to fix every problem with SSOs, but merely to help standardize the standardization process.

II. DEFINING A STANDARD: CONNECTING STANDARDS, GOVERNMENT AGENCIES, AND SSOS

A. What is a Standard?

One can learn a great deal about standards by visiting a local hardware store. Row after row of wrenches, drills, screws, and wood stand as homage to the benefits of standardization, with consistent measurements and sizes (e.g., two-by-four cuts of wood, metric and American-sized screws, nuts, etc.), leading to increased interoperability and consumer faith in the sufficiency and quality of the components. Yet, until the late nineteenth century such standards never existed; instead, all screws, nuts, and bolts were custom-made and, probably to ensure repeat business, incompatible with others.[5] William Sellers then proposed a standard to the industry, which became widely adopted and which brought about the mass production

[4] U.S. CONST. art I, §8, cl. 8.

[5] *The Fortune of the Commons*, THE ECONOMIST (London), May 10, 2003, (Survey) at 13.

necessary for the construction industry to flourish.[6] Thus, a standard's chief purpose is to bring some semblance of order and continuity to the affected parties, to "put everyone on the same page" by providing a common rubric from which to work.

Though Webster defines "standard" as "something established by authority, custom, or general consent as a model, example, or point of reference,"[7] it is ironic that a cornucopia of organizations exists for determining how that term applies to an industry or technology.[8] Standards tend to arise from one of two possible sources: standards become such because the market adopts them through sales and user preference, or an organization such as an SSO officially recognizes the standard. The first, commonly referred to as "de-facto standardization," occurs when "consumers gravitate towards a single product or protocol and reject its competitors" with no direct impetus from a third party.[9] An example of de facto standardization is the adoption of VHS over Betamax, which occurred despite the general view that Betamax was the better technology.[10] The other method, referred to as "de jure standardization," occurs when a governing body

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[6] Sellers proposed a "'uniform system of screw threads,' which later became widely adopted. Without standardized [sic], easy-to-make screws, Mr. Sellers' argument went, there could be no interchangeable parts and, thus, no mass production." *Id.*

[7] MERRIAM-WEBSTER'S DICTIONARY OF LAW 467 (1996).

[8] "Standards (and SSOs) come in a variety of forms." Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L. REV. 1889, 1896 (2002). *See also* Christopher L. Sagers, *Antitrust Immunity and Standard Setting Organizations: A Case Study in the Public-Private Distinction*, 25 CARDOZO L. REV. 1393, 1398 n.14 (2004) ("Even prior to the explosion of the high tech economy, one estimate of the late 1980s found as many as 400 private SSOs in the United States, producing as many as 30,000 standards . . . [and another] found that as many as 100,000 people were involved in standard setting activity."). Virtually all industrialized nations have at least one government-sponsored SSO, with a variety of smaller public and private organizations supplementing the SSOs in particular fields.

[9] Lemley, *supra* note 8, at 1899. *See also* Melonie L. McKenzie, *How Should Competing Software Programs Marry? The Antitrust Ramifications of Private Standard-Setting Consortia in the Software Industry*, 52 SYRACUSE L. REV. 139, 143 (2002). At times, random factors that defy more logical rationales such as superior technology or ease of use, such as public perception and chance marketing, appear to guide de facto standardization.

[10] *See* Penina Michlin, *The Broadcast Flag and the Scope of the FCC's Ancillary Jurisdiction: Protecting the Digital Future*, 20 BERKELEY TECH. L.J. 907, 929 n.148 (2005) (citing Filmbug, Video and VHS, http://www.filmbug.co.uk/dictionary/vhs.php (last visited Sept. 29, 2006)).

or SSO officially adopts and promotes a standard in the market.[11] Thus, when the FCC adopts a new transmission protocol for radio signals, the resulting protocol is less a result of market factors than of official decree.

Despite the plethora of methodologies and divergent doctrines that exist, most adopted standards stem from at least one of two rationales: commercialization and product interoperability or product safety and quality.[12] The desire for commercially-viable standards that promote interoperability is a hallmark of most private SSOs, as SSOs derive their inception and membership largely from key players in that industry.[13] Conversely, when private SSOs grapple with safety and quality concerns, the SSOs more commonly vest standard consideration in government agencies such as the Occupational Safety and Health Administration ("OSHA") and the Food and Drug Administration ("FDA"), agencies entrusted to protect the public from faulty or low-quality wares.[14]

1. Commercial and Interoperability Standards

The key difference between commercial and safety standards is best described as a means-end dichotomy. Safety and quality tend to be viewed as endgames alone, and thus a variety of methods that attain these standards are acceptable.[15] By comparison, the focus in a

[11] *See* Lemley, *supra* note 8, at 1898; McKenzie, *supra* note 9, at 144.

[12] Lemley, *supra* note 8, at 1897.

[13] This is discussed in greater detail later as it applies to the software industry, but at a base-level it is important to understand that most SSOs are voluntary organizations that require members to be financially involved in the field the SSO oversees.

[14] "Consumers have expectations about the design, performance, safety, quality and reliability of the products and services that they buy and use. No-one [sic] wants products of poor quality . . . which are incompatible with equipment he or she already has . . . . International Standards help to raise [these] levels . . . and provide these benefits economically." ISO and the Consumer, http://www.iso.ch/iso/en/comms-markets/consumers/iso+theconsumer.html (last visited Nov. 25, 2006).

[15] For example, every state has its own set of laws and statutes that tend to be unique to that jurisdiction, even though all states ostensibly design the laws for the same goal of defining the norms of a safe and productive society. Provided that these laws clearly outline common standards for crimes, property disputes, and social courtesies, the distinct methods by which they are obtained tend not to be questioned. For example, each state usually has its own bar exam that an applicant must pass in order to practice law. In these instances, homogeneity matters only in the result, not the method by which it is obtained.

commercial environment is a single acceptable standard from the surplus that currently exists, meaning "in some cases it may be more important that an industry coalesces around a single standard than which particular standard is chosen."[16]

Commercial standards are a classic example of "network effects," a phenomenon in which the standard is valuated not by some intrinsic merit of the technology but by the number of adopters in the industry.[17] This metric is extremely common in the software industry where "locking in" customers to a particular platform is far more valuable than the individual software sale.[18] For example, one of the most hotly-contested computer markets is large-scale

[16] Lemley, *supra* note 8, at 1896-97 ("The paradigmatic example is the telephone network, in which the value of the product is driven entirely by the number of other people on the same network."). *See also* McKenzie, *supra* note 9, at 142-43 (discussing the value of interoperability and consistency in software industries).

[17] *See* Lemley, *supra* note 8, at 1896 ("This is especially true in so-called "network markets," where the value of a product to a particular consumer is a function of how many other consumers use the same (or a compatible) product."); McKenzie, *supra* note 9, at 142-43 ("Network effects describe the value and utility of multiple complementary programs that are interoperable . . . . When more consumers use a particular network, more software programmers want to create programs that are interoperable with that network so they can sell more products.") (internal citations omitted); Patrick D. Curran, *Standard-Setting Organizations: Patents, Price Fixing, and Per Se Legality*, 70 U. CHI. L. REV. 983, 986-88 (2003) ("Uniform product standards can increase the value of products for all consumers, creating a demand-side economy of scale (in other words, a market where consumer demand for a product increases as the product becomes more widely used)."). For a more detailed discussion of network effects, *see* McKenzie, *supra* note 9, at 142 n. 15.

[18] This concept, commonly referred to as "vendor lock-in," has proven quite controversial in the software arena, ensnaring some of the largest providers of ubiquitous technologies, from operating systems to portable music. *See* Bruce D. Abramson and Dmitri L. Mehlhorn, *The Fettered Liberty to Integrate: Legal Implications of Software Engineering*, 10 B.U. J. SCI. & TECH. L. 209, 220-22 (2004) ("Microsoft's own developers reportedly often felt that the company sacrificed innovation for 'strategy,' the complex set of hooks and lock-in techniques that Gates invariably insisted on to steer customers toward Microsoft's end-to-end product line and keep them from being able to [sic] competitive products.") (internal citation omitted); David Adams, *Power Plays: The Phenomenon of Vendor Lock-in*, http://www.osnews.com/printer.php/11029/Power-Plays--The-Phenomenon-of-Vendor-Lock-in (last visited Nov. 15, 2006); Donna Higgins, *Antitrust Suit Against Apple Over iPod, iTunes to Proceed*, 23 No. 9 Andrews Computer & Internet Litig. Rep. 2; Siobhan Hughes, *Antitrust chief takes hands-off approach to Apple*, http://www.marketwatch.com (search "Antitrust chief takes hands-off approach to Apple") (last visited Nov. 15, 2006).

mainframes/servers and the operating systems ("OS") [19] they use, with the two primary operating systems being Windows and UNIX.[20] Neither OS is compatible with the other, meaning that software developed for one will not natively run on the other.[21] Thus, when a customer adopts either one as a server, he effectively purchases the suite of software developed for that platform while locking himself out of using the bulk of those developed for the competitor. Thus, instead of the sticker price of the particular OS measuring the value of the purchase, the future purchases and upgrades associated with that software do so.

Part of the reason "network effects" is so common in the computer industry is the incredible rate at which the technology evolves, where "the life span of software programs is approximately one and a half years."[22] Groundbreaking software becomes obsolete

[19] Operating systems manage system resources and programs that run on top of the system. Conceptually, the systems can be characterized as the computer's spine, sending commands from other body parts (i.e. monitor, keyboard, mouse, hard drive/memory, CD-Rom drive, etc.) to the brain (i.e. the computer's processor) and relaying the results back. Examples of common operating systems are Microsoft Windows, Mac OS X, Unix, and Linux.

[20] Unix, developed at AT&T Bell Labs in the 1960s and 1970s, is a non-proprietary operating system that became immensely popular at universities because of its robust features and scalability for handling the large mainframes commonly found at academic institutions, and with small start-up companies such as Sun Microsystems because of its low cost. Unix has historically been the most popular operating system found on company and college servers, though Microsoft has recently made inroads on this market dominance. *See* The Creation of UNIX* Operating System, http://www.bell-labs.com/history/unix/ (last visited Nov. 25, 2006); Gregg Keizer, *Windows Steals Top Server OS From Unix*, http://techweb.com/showArticle.jhtml?articleID=180206407 (last visited Nov. 15, 2006).

[21] Companies can always create different versions of the same program to run on the different operating systems (for example, virus and firewall software suites have historically sold versions compatible with most popular operating systems), but the additional effort and resources necessary to realize this congruity forces many smaller companies to market their software for only one, limiting users of the operating systems from utilizing their product.

[22] McKenzie, *supra* note 9, at 155 (citing Bruce H. Nearon, *Information Technology Security Engagements: An Evolving Specialty*, CPAJ., July 1, 2000, *available at* 2000 WL 12160867). A similar timeframe exists for computer hardware. *See* Gordon Irlam & Ross Williams, Software Patents: An Industry at Risk, http://lpf.ai.mit.edu/Patents/industry-at-risk.html (last visited Nov. 25, 2006). "[T]he software industry is developing much faster than other industries – even the computer hardware industry." Irlam notes that while most industries have a ten to twenty year cycle for major innovation, software has a razor-thin cycle that can result in innovations spanning only a few years. *Id.* In fact, Moore's law, which

and fossilized so quickly that an SSO's adoption would be effectively worthless if it were limited to a particular product instead of the underlying technology.[23] Plus, by adopting a base technology from which to work, SSOs are able to cut the surfeit of possible standards to a manageable list of compatible ones.

Symbiotic with this desire for an established base technology is another goal of both software developers and SSOs: interoperability. Interoperability "is achieved 'when information . . . can be exchanged directly and satisfactorily between' . . . two [or more] software programs," such as copying text from a document and pasting it into an e-mail with a few mouse clicks.[24] By producing code that can

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holds that the complexity of microchips (i.e. the number of transistors used) will double every eighteen to twenty-four months, is representative of the software industry's drive in innovation. 6 Norton Bankr. L. & Prac. 2d § 141:31. This rapid advancement in technology, Irlam argues, makes the statutory patent term of seventeen years (at time of publishing, since raised to twenty years) excessive and inapplicable. Irlam & Williams, *supra*. The problem is that when an industry innovates at such a fantastic pace, patents morph from shields to anchors, and restrict progress; designers must seek out licenses for technologies that are not applicable per se to their current design, but are required for compatibility or legal issues only. *See id.* For example, the first widely-used graphical web browser, NCSA Mosaic (forbearer of Netscape), was released in 1993. *See generally* A History of Browsers, http://www.quirksmode.org/browsers/history.html (last visited Nov. 25, 2006). Within four years, Netscape was joined by Microsoft Internet Explorer (IE), Opera, and a slew of smaller graphical and text-based browsers. Today, only twelve years after Mosaic was released, a quick search of download.com's Internet browser directory lists at least thirty browsers for various operating systems/machines, including IE, Firefox, Safari, Netscape, Mozilla, and Opera. *See* "Internet Browsers," http://www.download.com/3150-2356_4-0-1-0.html? (last visited Oct. 31, 2005). Even worse, if patents were granted for "what might then have seemed non-obvious or esoteric technologies" at the time, such as graphical user interfaces ("GUI") or Internet protocols, they "would be extremely damaging today" as designers would be hamstrung by licensing requirements on now-ubiquitous technologies. *Id.* The above-mentioned plethora of internet browsers is a prime example, for if patents had been granted for the technology used in Mosaic, further innovation and maturation of the software would likely have been stunted by licensing concerns.

[23] In that same vein, this short timeframe makes it virtually impossible for companies to recoup their R&D, manufacturing, and marketing costs for the product from this single sale. They need the pipeline of funds that flow from the more generalized adoption of their brand in order to profit. *See* Curran, *supra* note 17, at 989 ("By establishing a technical baseline for incremental product improvements, firms are not required to duplicate the costs of creating the initial product, and can instead rely on a certain level of functionality among the existing product and related products.").

[24] McKenzie, *supra* note 9, at 142 (internal citation omitted).

integrate itself with the products currently on the market, a developer increases the chances that her software will gain acceptance and benefit from the aforementioned "network effects."[25] Though an accepted standard inevitably "freezes out" those who resist adopting it,[26] the licensing of the standard "allows for 'efficient exploitation of the intellectual property, benefiting consumers through the reduction of costs and the introduction of new products.'"[27] The hope is that the innovation and creativity employed in creating services for the industry will funnel non-standard products into similar material for the industry's flagship.

Of course, whenever an SSO adopts a commercial standard from the general pool, cries of antitrust, stunted research and development,[28] and diminished returns by competitors are almost inevitable.[29] While some may view competitor claims as more alarmist than material, private SSOs must still consider these claims when promulgating standards, especially if the standards' adoption provides a monopoly power to the owner due to limited competition.[30]

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[25] *Id*. at 142-43. For example, Microsoft Windows is the dominant OS found on laptops and desktops around the world. Because of this, most commercial software companies design their products so that they are fully interoperable with Windows in order to take advantage of the market dominance enjoyed by Microsoft, even if it means their products are not fully compatible with other operating systems such as Linux. When pushed, most "companies will often gear their production to work with a product that is an industry standard, rather than a product that has only a small market share." Lemley, *supra* note 8, at 1896-97. *See also* Curran, *supra* note 17, at 998.

[26] The fluidity of the computer industry, though, tends to mitigate this effect somewhat. As shown earlier, there are multiple operating systems that users can choose, as well as a variety of processors on which to run the systems. Of course, there are limitations on the freedom to choose (e.g. different processors employ different instruction sets, meaning code written for an Intel chip will probably not work natively on a Power PC chip formerly used in Macs).

[27] McKenzie, *supra* note 9, at 150 (citing U.S. Dep't of Justice and Fed. Trade Comm'n, Antitrust Guidelines for Collaborations Among Competitors (1999)).

[28] This occurs when access to the standard is restricted by its owner, making it difficult for others to create complementary or competing products.

[29] *See* McKenzie, *supra* note 9, at 150. *See also* Curran, *supra* note 17, at 997.; Joseph Farrell & Michael L. Katz, *The Effects of Antitrust and Intellectual Property Law on Compatibility and Innovation*, 43 ANTITRUST BULL. 609 (1998). "The particular economic realities of the modern economy, including the importance of product interoperability, the increasing significance of innovation, and the prevalence of network industries, have already begun to shape the policies of modern antitrust enforcers . . . [pushing them to] advocate antitrust policies that encourage increased innovation." Curran, *supra* note 17, at 997.

[30] *See* McKenzie, *supra* note 9, at 150-52; Curran, *supra* note 17, at 998-1001.

Ultimately, though, the pro-competitive benefits of standardization eclipse these potential pitfalls; both private and public SSOs now adopt standards designed to benefit users, as opposed to using standards as a business tool to shut-out competition.

2. Safety and Quality Standards

Unlike their commercialized brethren, SSOs largely adopt safety and quality standards for the "intrinsic value of the product itself, and only secondarily with the network benefits of agreement on a particular standard."[31] These standards do not necessarily provide a commercial advantage to a particular designer or manufacturer, but adopt the most economical and safe product available in order to benefit users. This is particularly true if the process involves a government SSO, as such SSOs tend to be more nebulous, emphasizing the underlying technology more so than a particular brand. Finally, because they result from proactive steps taken by an SSO, they are generally classified as de jure standards.

3. Advantages and Disadvantages of SSOs in Software

a. Advantages

The biggest advantage with any SSO, but particularly in somewhat abstract fields like software, is the aforementioned interoperability among the standardized technologies.[32] By promoting particular technologies to an industry, developers have a set of basic components from which to design, as well as some confidence that compliance with these standards will allow their products to compete in the marketplace.[33]

With this tangible base from which to work, designers can also devote more time toward innovating products that will be useful to

[31] Lemley, *supra* note 8, at 1897-98.

[32] *See* Philip Weiser, *Internet Governance, Standard Setting, and Self-Regulation*, 28 N. KY. L. REV. 822, 836 (2001); McKenzie, *supra* note 9, at 139, 142-43; Clark, *supra* note 3, at 347-48. "Without standards, a technology cannot become ubiquitous, particularly when it is part of a larger network." THE ECONOMIST, *supra* note 5.

[33] "Using the same underlying codes provides for enhanced innovation in a way because it allows software programmers the ability to sidestep the 'reinventing the wheel' portion of software development." McKenzie, *supra* note 9, at 155.

consumers, thus serving one of the tenets of patent law.[34] More consumer-useful products also equates to more options in the marketplace for consumers, at least in the sense that there will be a reduced possibility of interoperability restrictions. Additionally, mass acceptance of the underlying technology means that the final product will likely be more robust and rigorously tested, as "[more] eyes on the work product should usually result in better quality."[35]

Finally, because standardized technologies must necessarily be clearly defined, they also provide precise boundaries around which others can design or augment. Like the incentive to design around inherent inpatentability, standardization gives innovators a clear blueprint of the scope of the current art and, perhaps most importantly, the end result their designs should strive to emulate. For example, the JPEG image format is the current de facto standard for images on the Internet primarily because of the high compression ratio and flexible image quality of the JPEG format. This power is derived largely from the algorithms utilized in the file's creation, most notably the discrete cosine transform ("DCT") formula.[36] For example, imagine a software developer who discovers an algorithm that she believes is more efficient at image compression than the standard and attempts to market it, either as a complement or direct substitute for the standard, established JPEG format. Because she knows the protocols and elements contained in the JPEG, this inventor can tailor her format to operate in the same browsers and programs as the standard[37] without fear that incompatibility issues will retard acceptance of her product.[38] Furthermore, if this format truly is more efficient and becomes the "new" JPEG standard, the fact that the inventor designed the new format with the legacy format in mind will greatly reduce compatibility issues with existing software and other concerns present in standards transition.

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[34] For a general overview of the commonly-accepted incentives involved with patents, *see* Rebecca Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1025-27 (1989); The Patent Prosecutor, Patent Economics: Part 4 – Incentives, http://www.patenthawk.com/blog/2005/04/patent_economics_part_4_incent.html#more (last visited Nov. 27, 2006).

[35] Clark, *supra* note 3, at 347.

[36] Compression, http://memory.loc.gov/ammem/pictel/mddp308.htm (last visited Nov. 27, 2006).

[37] For example, she declares that her protocol was "JPEG-compatible."

[38] Making the elements of the standard known greatly reduces the risk of the standard-holder "freezing out" competing models by restricting knowledge of operable components.

b. Disadvantages

However, the interoperability trumpeted as a major incentive to standardize comes at a cost; namely, the industry must be willing and able to produce software that adopts these standards.[39] While at first glance this does not appear to be a major issue (companies would not promote a standard if they did not later implement it), it must be remembered that more than one consortium might populate a market, and membership is likely to be exclusive.[40] Each SSO will promote its own standard, though ultimately only one standard usually receives widespread adoption in the marketplace. Once the market adopts a standard, "[t]he competitors who have spent their time and money adopting the 'obsolete' standards will lose their sunk costs and will have to pay in order to license the new standard."[41]

In this same vein, standardization of certain technologies might actually lead to a degradation in creativity and invention, as the ease of acceptance compared to the costs associated with forging a new path mutes the incentive to create.[42] In other words, companies might decide it is less taxing to simply pay for a license than to fight the standard, resulting in a creative vacuum that will perpetuate any deficiencies and limitations inherent in the status quo.[43] As a result,

[39] "[In a networked market,] [m]ost companies need to cooperate with others to establish standards and create a single network of compatible users. But as soon as the ink is dry on the standards agreement, [they] shift gears and compete head to head . . .you cannot take it on faith that the other market participants truly want to establish a standard. . . ." Clark, *supra* note 3, at 349 (quoting CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY, 228 (Harvard Business School Press 1999)).

[40] *See* CIS, Fact Sheet, http://www.interop.org/fact-sheet.html (last visited Dec. 12, 2006); Oasis, Who We Are - Mission, http://www.oasis-open.org/who/index.php (last visited Nov. 25, 2006); T1, Committee T1 Overview, http://www.atis.org/retiredcom.shtml (last visited Nov. 27, 2005); VESA, VESA Mission, http://www.vesa.org/About/mission.htm (last visited Nov. 25, 2006); GCA, What is GCA?, http://www.misersoft.com/gca/whatisgca.html (last visited Nov. 27, 2005).

[41] McKenzie, *supra* note 9, at 155. *See also* Clark, *supra* note 3, at 348 ("Open standards remove a barrier to market entry. If you already have a defensible market share, you might not want to remove that barrier.").

[42] "Just as a *de facto* standard ends up creating a need for 'leapfrog' technology…, so do adopted standards. This need for leapfrog technology will effectively keep small start-up companies out of the market," as they will lack the resources to compete with the established standard even if they have a "new, superior product." McKenzie, *supra* note 9, at 155.

[43] This seems particularly likely in industries where a dominant player exists who has amassed such a "war chest" of market control that it virtually precludes others

"the technology will stay mainstreamed to the standard, thus bypassing innovation that is only possible with different underlying codes."[44] Finally, any organization that relies on deliberations and acceptance by a group will necessarily suffer from hand-wringing and bureaucratic feet-dragging, creating a delayed acceptance of standards.[45] While such hindrances might be allowable in certain industries, the constant evolution and innovation that is the hallmark of software makes even minor delays extremely costly, ultimately resulting in standards that might not reflect the true state of the technology.[46]

B. Formation and General Powers of Administrative Agencies

Administrative agencies have become essential elements in the American system of government, rising in influence following social and economic calamities such as the Great Depression. Furthermore, the duties of governance have become more complex so as to require the full-time attention of knowledgeable civil servants.[47] These agencies typically combine the powers characteristic of the three branches of government, a phenomenon that has drawn criticism that the agencies enjoy too much unrestrained power and, in so doing, violate principles of separation of powers.[48] For better or for worse, agencies can promulgate rules relating to pertinent issues affecting private parties without consulting directly with Congress, investigate potential violations of rules or statutes, and adjudicate such matters, imposing appropriate penalties.[49] This freedom should not be construed as complete autonomy, however, as the legislative,[50]

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from competing. *Id.*

[44] *Id.*

[45] *See* Clark, *supra* note 3, at 348 ("Consensus takes time. A neutral SDO with broad participation and a careful deliberative process might not be able to bring a new data structure to market rapidly enough to suit a vendor's plans."); *See* McKenzie, *supra* note 9, at 155.

[46] *See* McKenzie, *supra* note 9, at 155 (noting that the average life span for a software program is one and a half years).

[47] Jennifer Lumley-Hluska, *The Contest of "Contested Cases": A Study on How the Connecticut Legislature's Reading of Two Words May be Depriving You of Your Right to Judicial Review and Due Process of the Law*, 23 QUINNIPIAC L. REV. 1239, 1254 (2005).

[48] Pete Schenkkan, *Texas Administrative Law: Trials, Triumphs, and New Challenges*, 7 TEX. TECH ADMIN. L.J. 287, at 293 (2006).

[49] *Id.*

[50] The legislature always enjoys the right to expand or retract the scope of an agency through subsequent legislation, as well as raise or cut funding depending on its performance and necessity. Such power has limits, however, as direct attempts to

executive,[51] and judicial[52] branches of the government can exert both official and unofficial oversight and review of these agencies. In addition, Congress enacted the Administrative Procedure Act in 1946 to standardize the public disclosure and participation requirements to which numerous government agencies, including the National Institute of Standards and Technology ("NIST"), must adhere.[53] That said,

invalidate agency rulings via "legislative vetoes" were invalidated by the Supreme Court as not conforming with Article I of the Constitution. *See* INS v. Chadha, 462 U.S. 919, 954 (1983). Congress may also exert unofficial control by requiring periodic reports from the agencies, reviewing their efficiency, and exerting public and political pressure through proposed legislation. Administrative Procedure Act, 5 U.S.C. § 551(14) (2006).

[51] Since the President is empowered by the Appointments Clause of the Constitution (U.S. CONST. art. II, §2, cl. 2) to select federal officers to administrative agencies, he enjoys far-reaching oversight and influence. Like the legislature, the President may also influence the agencies through public and political pressure, as well as institute executive orders that can alter an agency's goal or procedures. Building and Const. Trades Dept., AFL-CIO v. Allbaugh, 295 F.3d 28, 32-33 (D.C. Cir., 2002).

[52] "A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof." 5 U.S.C. §702 (2000). Though this right has been questioned at times, the Supreme Court has consistently upheld the right for judicial review of agency decisions and, on a grander scale, the delegation of judicial authority to an agency. *See* Crowell v. Benson, 288 U.S. 22 (1932), (allowing an agency to resolve workers' compensation claims by maritime workers). *See also* Thomas v. Union Carbide Agric. Prod. Co., 473 U.S. 568 (1985) (affirming the Environmental Protection Agency's right to use an arbitrator to remedy a dispute between pesticide companies).

[53] Though a thorough discussion of the Administrative Procedure Act ("APA") is unnecessary for the scope of this article, a brief discourse of the Act's history and requirements will shed some light on the duties federal agencies owe to the government branches and the general citizenry. Codified as 5 U.S.C. §500 (2000), the APA was "framed against a background of rapid expansion of the administrative process as a check upon administrators whose zeal might otherwise have carried them to excesses not contemplated in legislation creating their offices. It created safeguards even narrower than the constitutional ones, against arbitrary official encroachment on private rights." United States v. Morton Salt Co., 338 U.S. 632, 644 (1950). This "zeal" was most pronounced in the adjudicative wings of these agencies, where the muddled distinction between formal and informal adjudication troubled those required to comply with these agencies' mandates. *See* PETER WOLL, ADMINISTRATIVE LAW – THE INFORMAL PROCESS 20-21 (University of California Press 1974) (1963). Not surprisingly, the APA's enactment was "[w]idely hailed as the most important enactment of the century in administrative law." *Id.* This praise stemmed largely from the Act's clear communication of the duties and limitations of an agency's hearing examiners and commissioners, which left "little doubt in the minds of those who deal with the various commissions that the examiners are independent and not subject to the whims of the commissioners." *Id*. This

these agencies are still treated much like a clockmaker handles a new watch: the agencies are set to the proper values, wound up for energy, and then left alone except for occasional recalibrations. The assumption is that agencies' design and limited duties will guide them toward the correct goal without significant deviation.

1. The National Institute of Standards and Technology

A congressional directive created the NIST in 1901 to address the growing need for technology standards in America. Originally called the National Bureau of Standards, the NIST served as the "first physical science research laboratory of the federal government."[54] The agency's task was to aggregate the regionalized, and oftentimes confusing, standards that existed across the country into a consistent, universal system in line with those established in other industrialized nations.[55] Previously, these localized standards hamstrung commercial growth both nationally and internationally because the products were of inconsistent quality and were sometimes incompatible with products from other markets.[56] Over time, the NIST was able to implement precise standards in a variety of fields,

separation is essential for proper agency administration, for "once such independence has been destroyed, the prosecuting arm of the agency can easily influence adjudicative decisions." *Id*. at 21. Another key element of the APA is that the regulations and procedural steps of administrative agencies must be made public. 5 U.S.C. §552 (2000), amended by the Freedom of Information Act, requires all agencies to "separately state and currently publish in the Federal Register for the guidance of the public" an expansive list of documents associated with the agency's inner workings, including procedures, judgments of cases, and policy determinations. 5 U.S.C. §552(a). In addition, 5 U.S.C. §552(b) specifies what meetings and agency proceedings must be publicly available for review and comment. This transparency is particularly important in organizations like NIST that rely on external submissions and interaction in order to fulfill its administrative duties. *See* THE U.S. CERTIFICATION SYSTEM FROM A GOVERNMENTAL PERSPECTIVE (NISTIR 6077) (Oct. 1997), *available at* http://ts.nist.gov/Standards/Conformity/govcer.cfm (last visited Oct. 21, 2006).

[54] *See* National Institute of Standards and Technology (NIST), The Founding, http://www.100.nist.gov/founding.htm (last visited Oct. 21, 2006).

[55] *Id.*

[56] Scientists and engineers, particularly abroad, often complained about the wildly inconsistent standards found in America prior to the NIST. *Id.* "One complained, for example, that he had to contend with eight different 'authoritative' values for the U.S. gallon." *Id.* Further testimony to this need occurred in 1904, when 1,500 buildings in Baltimore, Maryland burned to the ground because the fire hose couplings on fire trucks from Washington D.C and New York, amongst others, were not compatible with hydrants in the city. *Id.*

such as electricity, mass, time, and temperature, and has retained a leading role in shaping the country's technological maturation and global renaissance ever since.[57]

There are a number of specialized departments within the NIST that review current technologies and standards in a variety of fields, including CARB (Center for Advanced Research in Biotechnology),[58] AML (Advanced Measurement Laboratory), and MEL (Manufacturing Engineering Laboratory).[59] In particular, there has been significant growth in the number and scope of departments dedicated to hardware and software in recent years, with the Information Technology Laboratory ("ITL") leading the charge.[60] Within the ITL, divisions such as the Software Diagnostics & Conformance Testing Division ("SDCT") and the Computer Security Division ("CSD"), seek to provide standardized benchmarks, technologies, and testing suites for software developers in a variety of fields, including XML[61] data handling and digital cryptography.[62] By

[57] The NIST has been involved in virtually all technological (and social) advances over the past 100 years, from the popularization of radios, the standardization of building and plumbing equipment, and aeronautics. *See generally* NIST, Centennial Home Page, http://www.100.nist.gov/cent_toc.htm (last visited Oct. 21, 2006). In addition to standardization, the NIST has been involved in the discovery and commercialization of numerous inventions and phenomena, including uranium fission, electronic circuit design, medical tools such as blood pressure and heart rate monitors, and computers (most notably the ASCII text format). *See* Postwar Years, www.100.nist.gov/postwar.htm (last visited Oct. 21, 2006). *See also* The Space Age, www.100.nist.gov/spaceage.htm (last visited Oct. 21, 2006).

[58] The NIST CARB is not to be confused with the California Air Resources Board, a state-run SSO.

[59] For a complete list, *see* NIST, A-Z Subject Index, http://www.nist.gov/public_affairs/siteindex.htm (last visited Oct. 21, 2006).

[60] ITL's most notable duties include "formulating metrics, tests, and tools for a wide range of subjects such as information complexity and comprehension, high confidence software, space-time coordinated mobile and wireless computing, as well as issues of information quality, integrity, and usability" and determining cybersecurity standards and techniques under the Federal Information Security Management Act. *See* ITL, What ITL Does, http://www.itl.nist.gov/itl-what_itl_does.html (last visited Oct. 21, 2006).

[61] Short for eXtensible Markup Language.

[62] Andres Rueda, *The Implications of Strong Encryption Technology on Money Laundering*, 12 ALB. L.J. SCI. & TECH. 1, at 7 (2001). Cryptography is a technology that disguises messages using codes, ciphers, and algorithms, so that only the intended recipient can access its meaning. CSD, Mission, http://csrc.nist.gov/mission.html (last visited Nov. 15, 2006). For obvious reasons, the federal government is quite interested in this field, with one of the CSD's goals being to "establish minimum security requirements for Federal systems. *Id.*

providing these tools and standards, the NIST is able to exert substantial influence on the computer industry to produce quality software that will be interoperable with both legacy code and future releases.

2. The American National Standards Institute

As one would expect, the costs associated with developing such technologies are generally too great for the NIST alone to finance, so the Institute often relies on SSOs to voluntarily submit standards for federal approval.[63] These suggestions, called Federal Information Processing Standards ("FIPS"), are published in numerous reporters and websites,[64] subjected to between thirty and ninety days of public comment, revised if necessary, and then finally adopted.[65]

Most of these suggestions arrive either directly or indirectly from the American National Standards Institute ("ANSI"), which serves as the "administrator and coordinator of the United States private sector voluntary standardization system."[66] Though not an official government department like the NIST, ANSI is highly influential and its standards, in most instances, are adopted by the NIST with few reservations.[67] This imprint was further augmented in 1996 when Congress amended the National Technology Transfer and Advancement Act to require the NIST to "coordinate the use by Federal agencies of private sector standards, emphasizing where possible the use of standards developed by private, consensus organizations" instead of unique government-produced standards.[68]

The membership of ANSI is comprised chiefly of smaller SSOs focusing on a specific field, and acceptance by ANSI is proof

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[63] NIST, http://www.itl.nist.gov/fipspubs/geninfo.htm (last visited Nov. 15, 2006). "In accordance with the National Technology Transfer and Advancement Act of 1995 . . . NIST supports the development of voluntary industry standards both nationally and internationally as the preferred source of standards to be used by the Federal government." *Id.*

[64] *Id.* FIPS are published in the *Federal Register* and on the NIST and Chief Information Officers Council's websites. *Id.*

[65] *See id.*

[66] ANSI Introduction, http://www.ansi.org/about_ansi/introduction/introduction.aspx?menuid=1 (last visited Nov. 15, 2006) [hereinafter ANSI Introduction].

[67] *See* ANSI Introduction, *supra* note 66; McKenzie, *supra* note 9, at 146 (2002) ("[ANSI] is the group that coordinates all the standard-setting consortia in the country, ultimately trying to establish a consensus for the NIST.").

[68] H.R. 2196, 104th Cong. (1996).

that the proffered standard meets "the Institute's essential requirements for openness, balance, consensus and due process." [69] Beyond national standards, ANSI acts as the face of the United States in international standardization matters, with membership in both the International Organization for Standardization ("ISO") and the International Electrotechnical Commission ("IEC"), two powerful international consortia.[70] Much like the NIST, ANSI utilizes a multi-tiered approach to standard accreditation, with suggested technologies published, reviewed by interested parties, and then finally accepted after the adoption of any amendments.[71]

3. SSOs: Composition and Patent Policies

Critics argue that ANSI's procedure, while consistent and systematic, fails to address or compensate for the greatest variable involved in a standard's creation—the composition and intent of the SSOs involved. In general, SSOs are independent groups of varying autonomy within a given industry, with voluntary membership usually culled from for-profit companies within the industry. There is little oversight on membership beyond who shows up and pays the consortium's dues,[72] meaning "most . . . are open to anyone who wishes to join."[73] While this approach may be viewed as encouraging a wide array of viewpoints that might enrich any standardization discussion,[74] critics counter that this viewpoint is too myopic. They

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[69] ANSI Introduction, *supra* note 66.

[70] *See id*.

[71] *See id*.

[72] The vast majority of SSOs, such as W3C (http://www.w3c.org/Consortium/fees), OASIS (http://www.oasis-open.org), and The Open Group (http://www.opengroup.org), require dues varying from a few thousand dollars to $60,000 or more per year, and have scheduled meetings and provide updates to members of relevant issues in the field. A smaller subset such as the Internet Engineering Task Force (IETF) (http://www.ietf.org) is due-free and, not surprisingly, far less organized. *See* Scott Bradner, *The Internet Engineering Task Force*, *in* OPEN SOURCE: VOICES FROM THE OPEN SOURCE REVOLUTION (Chirs DiBona, Sam Ockerman & Mark Stone eds. 1999), *available at* http://www.oreilly.com/catalog/opensources/book/ietf.html ("The IETF can be described as a membership organization without a defined membership."); Clark, *supra* note 3, at 350 n.10.

[73] Clark, *supra* note 3, at 350.

[74] *Id.* at 372. ("[SSO members] were in one sense disinterested in the outcomes: they wanted to produce nothing more than code that would work.") (quoting LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 207 (BASIC BOOS 1999)).

argue that a world "where standards are the product of competition; where standards tied to a dominant standard have advantages," and companies constantly jockey for position has long replaced benevolent and altruistic programmers seeking compatibility.[75] Emblematic of this fundamental shift is the fact that some of the biggest software companies in the world (IBM, Hewlett Packard, and Sun Microsystems, to name a few) are voting members of influential SSOs and have shown propensities to push for adoption of their own technologies as a means of advancing their respective market shares.[76]

Perhaps to combat these concerns of favoritism and commercial influence, many SSOs have adopted definitive policies concerning standards that incorporate patented technologies owned by members.[77] Though each organization employs its own system tailored to the SSO's market and purpose, most can be categorized as forced disclosure, forced licensing, or a combination of the two.[78] Forced disclosure is a preemptive doctrine applied prior to the standard's acceptance, while forced licensing of patents takes effect after the fact.

A forced disclosure policy "requires disclosure of information regarding patents that might apply to the technology being specified by the standards working group," with both the standard's submitter

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[75] *Id.* ("We are entering a world where code is corporate . . . . To the extent that this code is law . . . we should worry about how it is structured and whose interests may define its constraint . . . . If code is law, who are the lawmakers?") (quoting LAWERENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 207 (Basic Books 1999)) .

[76] *See* Lemley, *supra* note 8, at 1906-07 ("[I]n 1998 Sun Microsystems participated in eighty-seven different SSOs); McKenzie, *supra* note 9, at 145; Weiser, *supra* note 32, at 831 (stating as companies push for commercialization within these organizations, "the stakeholders in the future...become more...concerned with...profits, stable, open, and end-to-end-based standards may well become the exception, not the norm."). *See generally* The Economist, *supra* note 5 (arguing that while standards are becoming increasingly "open," companies such as Sun are still quite weary of their proffered standards losing market relevance through too much public augmentation).

[77] For a detailed discussion of various SSOs' policies, *see* Lemley, *supra* note 8, at 1973-75 (Appendix).

[78] *See* Bruce Perens, The Problem of Software Patents in Standards, http://perens.com/Articles/PatentFarming.html (last visited Nov. 25, 2006). *See generally* W3C Patent Policy, http://www.w3.org/Consortium/Patent-Policy-20040205/ (last visited Dec. 12, 2006); Guidelines for Implementation of the ANSI Patent Policy, http://www.niso.org/committees/OpenURL/PATPOL.pdf (last visited Nov. 25, 2006); IEEE, IEEE-SA Standards Board Operations Manual, §6 Copyrights, Trademarks and Patents, http://standards.ieee.org/guides/opman/sb-om.pdf (last visited Nov. 25, 2006) [hereinafter *IEEE Manual*].

and working group members identifying patents incorporated in the proposed technology.[79] These proactive revelations, usually coupled with additional patent searches by the SSO, are intended to inform members of all potential legal issues before standard ratification.[80] The linchpin of this theory, though, is that the interested members will be inclined to disclose conflicting patents and applications to the members, a tall order considering the financial stakes involved in technology standardization and the limited recourses the organization can take.[81]

By comparison, forced licensing applies when use and ownership of a patent incorporated in an accepted standard becomes an issue, with the usual remedy being that the owner must license the technology to fellow consortium members on predefined terms.[82] These terms can vary significantly, ranging from royalty-free to purely non-discriminatory in price, meaning every member pays the same fee.[83] Historically, "reasonable and non-discriminatory" ("RAND")[84]

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[79] Perens, *supra* note 78.

[80] *See id.* In addition, the SSOs will require members to license undiscovered patents at a reasonable rate. *Id.*

[81] *See id.* Of course, sometimes members will proactively disclose their patents for a variety of reasons. IBM, the nation's largest patent holder, recently announced that the company would begin publishing its patent application when filed, promoting an open discussion of prior art as well as place other interested parties on notice of its pending claims. Steve Lohr, *Hoping to Be a Model, I.B.M. Will Put Its Patent Filings Online*, N.Y. TIMES, Sept. 26, 2006, at C5. This proposed public review process has spurred on other companies, including Microsoft, General Electric, and Intel, to agree to publish some of their applications. *Id.* Of course, the argument can be made that large companies are usually not the main culprits of patent enforcement "malaise," but instead are usually the victims of this practice. Thus, unless this proactive step spurs on a more industry-wide evolution, it may ultimately prove to be nothing more than a new coat of paint on a rusty car.

[82] Perens, *supra* note 78.

[83] *Id.* Though ostensibly fair, a flat fee can actually discriminate against small companies and Open Source members of an SSO when the cost is too great to bear. *See id.*

[84] W3C Patent Policy Framework § 4(e), http://www.w3.org/TR/2001/WD-patent-policy-20010816/#sec-definitions (last visited Nov. 27, 2006). This policy features some key requirements to provide equitable and uniform fees. *Id*. Most important of these are the policy's requirements that licensing be available to all implementers of the standard irrespective of their membership in a given SSO and conditioned on reciprocity, and that licensing cannot "impose any further conditions or restrictions on the use of any technology" beyond those enumerated in the license. *Id. See also IEEE Manual*, *supra* note 78, § 6.3.1 ("The following notice shall appear when the IEEE receives assurance from a known patent holder or patent applicant prior to the time of publication that a license will be made available to all applicants either without compensation or under reasonable rates, with reasonable

nomenclature embodied the most contentious terms, which vary licensing fees depending on each user's characteristics.[85] Beyond fiduciary conditions, forced licenses can also limit the implementation of the patented material to the standard itself, as opposed to any use of the technology, and in some extreme cases can lead to the dissolution of the standard if the licensing issues are unresolved.[86]

Of course, all of these licensing systems and "patent-protected" standards have a major caveat: "standards organization policies are not legislation," and thus lack enforcement power on patent holders who are non-members.[87] While organizations can certainly pressure these reticent holders in a variety of ways (e.g., ANSI/NIST accreditation of a standard is publicly and financially important in some industries, so denial or rescission could be quite influential), there remains the possibility that a patent holder could extract sizable licensing and infringement fees from implementers of a standard without any legal repercussions. Furthermore, because of the voluntary nature of these SSOs, there are only limited remedies against members who display similar reservations about disclosure and licensing, usually in the form of fines and dismissals.[88] Thus, while SSOs and their patent policies are certainly making headway toward producing truly open standards, a number of fundamental barriers remain.

III. *LEMPEL-ZIV-WELCH*, *RAMBUS*, AND THE HIDDEN COSTS OF PATENTED STANDARDS

This discussion of the benefits and weaknesses surrounding patents and their subversive effects on software standardization, like

terms and conditions that are demonstrably free of any unfair discrimination") and ISO Standards Development, ISO/IEC Standards and Patents, http://isotc.iso.org (search "ISO/IEC Standards and Patents.") (last visited Nov. 27, 2006) (noting that in order to "ensure that the standards can be applied and used worldwide on a fair and equitable basis, ISO and IEC need to receive from the owners of such rights, statements that they are willing to grant licenses to applicants worldwide on reasonable and non-discriminatory terms" that incorporate patented technology).

[85] W3C Patent Policy Framework, *supra* note 84. For example, an Open Source or freeware software developer might be granted a royalty-free license while a proprietary developer would be charged a standard royalty fee. This discretionary payment system has led some to complain that commercial developers are being unfairly discriminated against without just cause. *See* Lemley, *supra* note 8, at 1906.

[86] *See* Perens, *supra* note 78.

[87] *Id.*

[88] SDOs "are by definition voluntary, so they have few binding remedies with which to work." Clark, *supra* note 3, at 371-72.

many policy arguments, would be nothing more than excited rhetoric without examples that embodied these concerns. What follows are two recent examples of the dilemmas that can arise when standardization runs afoul of patented technologies, in particular when SSOs do not disclose intellectual property to the public until the SSOs adopt the standard. The first case concerns the owner of the patented compression algorithm incorporated in the popular GIF image format, which became the de facto standard for images on the Internet, and the decision to seek licensing dues from users years after the standard was established. The second illustration concerns Rambus Inc., a designer of computer memory that promoted a standard incorporating technology on which the company had pending patents. Once the SSO adopted the standard, however, Rambus modified its patent applications so that the company's claims then covered the standard, allowing Rambus to derive licensing fees and enforce other intellectual property rights against unwitting users.

A. The Lempel-Ziv-Welch *Compression Algorithm*

For the software industry, a cautionary tale goes by the three-letter acronym LZW (short for Lempel-Ziv-Welch, the algorithm's inventors), and its mere mention tends to elicit disdain and scorn. Though the offending patent expired on June 20, 2003,[89] it remains the archetype of the dangers of privately-held software patents being incorporated in mass-produced code or standards, as well as a veritable blueprint of the patent process.

The LZW patent is a compression algorithm that creates a dictionary index of common strings found in a file, with each large entry in the dictionary represented by a much smaller "placeholder" value.[90] While similar compression methods already existed (such as LZ77[91] and LZ78[92]) prior to its creation, LZW was seen as an

[89] LZW Patent and Software Information, http://www.unisys.com/about__unisys/lzw (last visited Nov. 27, 2006).

[90] For more information about the LZW algorithm, *see* Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 MICH. TELECOMM. & TECH. L. REV. 191, 226 (2005), *available at* http://www.mttlr.org/voleleven/campbell-kelly.pdf; Michael C. Battilana, *The GIF Controversy: A Software Developer's Perspective*, June 20, 2004, http://www.cloanto.com/users/mcb/19950127giflzw.html (last visited Dec. 29, 2005).

[91] LZ77 relied on a sliding window in which duplicate strings would be compressed down. This method is still used in most archival file formats, such as ZIP, RAR, etc. Stuart Caie, *Sad Day . . . GIF Patent Dead at 20*, July 28, 2003,

extremely efficient method for compressing image files because of their repeating nature and small number of possible values (in the mid-1980s, most images were limited to 256 colors). On December 10, 1985, the Patent Office issued patent 4,558,302 "High speed data compression and decompression apparatus and method" to the Sperry Corporation, which later became known as Unisys.[93]

While facially this seemed innocuous, problems arose because Terry Welch, the algorithm's chief inventor, had already published an article approximately a year earlier detailing LZW and its usage in *IEEE Computer* magazine, a popular periodical at the time.[94] Though the article mentioned that the implementation was proprietary, it never explicitly stated that a patent was pending on the algorithm and did little to dispel the notion that the algorithm was free to readers.[95] One of the many adopters of LZW was CompuServe Inc., a fledgling software company that incorporated the compression algorithm into its free image format, GIF. From 1987 to 1994, GIF became the global standard image format for websites, with neither CompuServe nor Unisys addressing the unlicensed use of the LZW algorithm that GIF embodied.[96] As GIF's usage proliferated, so did this silence, until December 24, 1994, when Unisys and CompuServe jointly announced the companies would require developers to pay royalties on the LZW algorithm.[97] The thrust of this licensing was on software developers who used the algorithm in their products;[98] yet, uncertainty and debate

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http://www.kyz.uklinux.net/giflzw.php (last visited Nov. 25, 2006).

[92] LZ78 used the same dictionary method as LZW, but was less efficient and never obtained widespread acceptance. *Id.*

[93] *Id.*

[94] Terry A. Welch, *A Technique for High-Performance Data Compression*, IEEE COMPUTER, June 1984, http://sochi.net.ru/~maxime/doc/welch.shtml (last visited Nov. 25, 2006).

[95] *See* Caie, *supra* note 91. Also, note that since patents on software were recognized only a few years earlier, many of the readers at the time probably did not even consider the possibility that the algorithm was patentable.

[96] *See id*.; s*ee also* Battilana, *supra* note 90.

[97] *See* Caie, *supra* note 91. Some of this delay by Unisys/CompuServe in enforcement was attributed to the difficulty in identifying infringing uses. "The world was a lot less 'wired' in 1994, a Unisys lawyer couldn't enter 'LZW' into the Google search engine and come up with thousands of infringers in a single stroke." *Id.*

[98] There was some concern that the patent covered the GIF format itself, which was not the case. In a press release by CompuServe, it was made clear that "'[f]or people who view GIF images, who keep GIF images on servers, or who are creating GIF images for distribution, the recent licensing discussions have no effect on their activities.'" Battilana, *supra* note 90.

raged over what GIF usage necessitated a license and the rights granted.

What was troubling about this ordeal was not that Unisys owned a patent on the LZW algorithm, but that myriad programs and file formats incorporated the algorithm without any apparent patent holder or user knowledge.[99] Furthermore, the problem only became publicly known after these uses, particularly GIF, became ubiquitous in public use. Not surprisingly, users felt ambushed[100] by this revelation, and efforts were made to bypass the GIF format either by replacing the LZW algorithm with another,[101] or creating a completely new image format, culminating in PNG.[102] The problem remained, though, that GIF was the most widely accepted image format in computing. Even though the W3C[103] (the Internet's standard-setting body) had "officially endorsed the PNG specification as a 'W3C Recommendation,'" Netscape and Microsoft (among others) provided more robust support for GIF in their browsers.[104] Ultimately, a number of software companies were forced to license the LZW algorithm from Unisys, resulting in millions of dollars in fees over the years.[105] While the industry-wide Armageddon many first envisioned

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[99] Starting in 1989, some computer magazines and software manuals using the algorithm (such as *PC Week* and the *PostScript Language Reference Manual*) ran letters and stories noting that the LZW patent was owned by Unisys, meaning "at least the readers of some publications were potentially aware of the LZW patent. But still, there were few links to GIF." Battilana, *supra* note 90.; *see also* Caie, *supra* note 91.

[100] Though certainly rich with hyperbole, one poster on a popular BBS forum said the LZW enforcement was "the online communications community's equivalent of the sneak attack at Pearl Harbor." Battilana, *supra* note 90.

[101] Some developers tried to replace LZW with different data structures and procedures such as Shannon-Fano or AVL Trees, but were rebuffed when it became clear that "[i]f the output data is [compressed] GIF, the compressor infringes the Unisys patent regardless of the algorithm." Battilana, *supra* note 90. More successful were attempts to create different (though not always compatible) image formats, such as JPEG, Unisys's own free GIF24, and GEF. *Id.*

[102] Which was a culmination of GIF24 and GEF formats, officially short for "Portable Graphics Network," or colloquially for "Png is Not Gif." *Id.*

[103] W3C is short for World Wide Web Consortium.

[104] Battilana, *supra* note 90.

[105] Though the GIF patent might be the most famous example of this phenomenon, the patent certainly is not unique for its underlying principles or its huge financial implications. One example is the ongoing litigation between Eolas Technologies, Inc. and Microsoft. Eolas claims to have invented the technology behind embedded files and applications in websites (e.g. loading a Flash application or PDF in a browser window), and sued Microsoft for infringement related to IE's use of this plug-in technology via Microsoft's ActiveX libraries. With IE's

never materialized, the GIF controversy served as a microcosm of the dangers of hidden patents in standards and the potential of a single company to take the software industry hostage.[106]

Perhaps the biggest surprise surrounding the LZW/GIF controversy was that the matter never went to court, most likely because there were few, if any, legal doctrines with which a party could charge Unisys. There was no obvious fraud or duplicitous action by Unisys in the standard's adoption, as the community embraced the GIF format through usage with little impetus by Unisys. At worst, Unisys's greatest sin was the company's failure to provide proper notice of the patent to users as they adopted the technology; the company waited years before it enforced its patent rights.[107] Even that

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dominant market share of internet browsers (accounts vary, but most agree at least 85% of the market), this technology became a de facto standard in the industry. Though it has since been appealed and remanded, Eolas actually won a $521 million settlement for this apparent infringement. Eolas Tech., Inc. v. Microsoft Corp., 2004 U.S. Dist. LEXIS 534 (N.D. Ill. Jan. 15, 2004), *vacated in part*, 399 F.3d 1325 (Fed. Cir. 2005), *cert. denied*, 126 S. Ct. 568 (Oct. 31, 2005). *See also* Paul Festa, *The Eolas-Microsoft case--patent ending?*, CNET News.com, March 16, 2004, http://news.com.com/2100-1032_3-5173287.html) (last visited Nov. 27, 2006). Such a settlement could lead to exorbitant licensing agreements by browser companies if upheld.

[106] A similar scenario occurred in 2002, when Forgent Networks informed users of the JPEG image format (the de facto successor to GIF) of the company's claimed patent rights and began seeking licensing fees. Though Forgent, which received the patent when the company purchased Compression Labs in 1997, was able to obtain over $90 million in licenses and lawsuits from users, a consortium of twenty-one major computer companies, including Microsoft, brought countersuit seeking the invalidation of the patent because of prior art. Though the patent itself expired in 2006, the lawsuit has yet to be resolved. *See* Amit Asaravala, *Forgent Sues Over JPEG Patent*, Wired News, http://www.wired.com/news/business/0,1367,63200,00.html?tw=wn_tophead_1 (last visited Nov. 27, 2006); Stephen Lindholm, *Marking the Software Patent Beast*, 10 STAN. J.L. BUS. & FIN. 82, 108 (2005).

[107] A number of defenses do exist in patent law against a patentee who does not make her patent rights known to users for extended periods of time, but each has limitations that make their implementation a more troubling process than perhaps it should be. The leading defense is called "laches," which was used successfully in both *A .C. Aukerman Co.* and *Odetics, Inc.* to protect the plaintiffs against these disclosures. A.C. Aukerman Co. v. R.L. Chaides Constr. Co., 960 F.2d 1020 (1992), *on remand* 1993 U.S. Dist. LEXIS 17101 (N.D. Cal. 1993); Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259 (Fed. Cir. 1999). The concept of laches is codified in 35 U.S.C. §282, which provides the defense against patent infringement if one can show that the charging party undertook unnecessary delay in disclosing its patent claims to the infringing party. *A.C. Aukerman Co.*, 960 F.2d at 1028. In *A.C. Aukerman Co.*, the Northern District of California found that the defense applied

oversight might have been unintentional, since "[t]he world was a lot less 'wired' in 1994" compared to today, meaning that a "Unisys lawyer couldn't enter 'LZW' into the Google search engine and come up with thousands of infringers in a single stroke. Unisys had, in fact, been licensing big LZW infringers that it discovered in its own field of work."[108]

B. The Rambus *Dynamic RAM Design*

This apparent ignorance, coupled with Unisys's "hands-off" involvement in GIF's de facto standardization likely precluded litigation. Yet, the courts have displayed reservations in sanctioning a patentee's subsequent infringement claims when a company is instrumental in an SSO's adoption of the company's technology but remains silent about potential intellectual property rights, as was the case in *Rambus, Inc. v. Infineon Tech. AG*.[109]

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provided that "[t]he patentee, through misleading conduct, leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer," "[t]he alleged infringer relies on that conduct," and "[d]ue to its reliance, the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim." *Id.* While a valid patent allows the patent holder to exclude others from using the patented technology, the court "[was] not [going to] assist one who has slept on his rights." *Odetics, Inc.*, 185 F.3d at 1273. A less powerful offshoot of this general laches defense is called "prosecution laches," which is "a defense to an infringement action involving new claims issuing from divisional and continuing applications that prejudice intervening adverse public rights." Symbol Tech., Inc. v. Lemelson Med., Ed. & Research Found., LP, 277 F.3d 1361, 1364 (Fed. Cir. 2002). As the definition denotes, though, this defense only applies to *pending* patents prior to their issuing. In *Symbol Tech., Inc.*, for example, appellee Lemelson originally filed patent applications for a technology used in bar code readers in 1950 when no such devices existed, kept filing divisional and continuance motions to update the technologies in his applications as the industry matured, and then had the patents filed in the 1970s and 1980s so that he could sue the patent's users. *Id.* at 1363-64. The Federal Circuit ultimately ruled that prosecution laches was a valid defense against Lemelson because of the extreme delay between filing and issuance of his patents, and remanded the matter for further deliberations. *Id.* at 1368; s*ee also* Krebs, Robert and W. Samuel Niece, *Prosecution Laches: Lemelson Bar Code and Machine Vision Patents Held Unenforceable*, FindLaw.com, http://library.findlaw.com/2004/May/11/133416.html (last visited Feb. 17, 2006). By comparison, there is no evidence that Unisys unnecessarily delayed the issuance of the LZW patent or attempted to cover up its existence prior to the enforcing of its rights.

[108] Caie, *supra* note 91. *See also* Battilana, *supra* note 90 ("Unisys apparently didn't know about GIF, nor did most GIF developers know that GIF contained LZW technology.").

[109] 318 F.3d 1081 (Fed Cir. 2003), *cert. denied*, 540 U.S. 874 (2003). For a more

1. Background

Rambus is a leading designer of personal computer memory, and licenses these technologies for production by high-speed chip manufacturers, such as Infineon.[110] In April of 1990, Rambus filed a patent for technologies associated with dynamic random access memory ("DRAM"), the most common memory design used in modern personal computers.[111] After the Patent and Trademark Office ("PTO") issued an eleven-way restriction requirement,[112] Rambus filed at least 31 divisional and continuation applications that came to incorporate various elements of the DRAM technology, as well as a Patent Cooperation Treaty ("PCT")[113] claiming priority for this patent.[114]

While these patents were pending, Rambus joined Joint Electron Devices Engineering Council ("JEDEC"), "a leading developer of standards in the solid-state industry,"[115] in 1992 and began working with committee JC-42.3, the JEDEC's appendage for adopting random access memory standards.[116] While Rambus periodically attended meetings, JC-42.3 adopted two memory

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detailed background and analysis of this lawsuit, s*ee* David Alban, Rambus v. Infineon: *Patent Disclosures in Standard-Setting Organizations*, 19 BERKELEY TECH. L.J. 309, 320 (2004); Andy Updegrove, *Rambus – Hard Cases Make Bad Law*, http://www.consortiuminfo.org/bulletins/feb03.php#editorial (last visited Dec. 12, 2006). [hereinafter *Updegrove Hard Cases*]

[110] *Rambus*, 318 F.3d at 1084. Rambus does not manufacture the actual memory modules, but instead provides the schematics and technologies behind their design.

[111] *Id.*

[112] A restriction requirement occurs when the patent examiner feels two or more distinct inventions are encompassed in a single claim, which violates the "one invention per claim" requirement for patent applications. S*ee* U.S. Dep't of Commerce, Patent and Trademark Office, Manual for Patent Examining Procedure §§ 809.02(a), 818 (2005) (8th ed. 2001), http://www.uspto.gov/web/offices/pac/mpep/documents/front.htm (last visited Dec. 12, 2006) (providing the PTO's official stance on this procedure).

[113] A Patent Cooperation Treaty is an application to the Intellectual Property Organization.

[114] *Rambus*, 318 F.3d at 1084-85. Divisional and continuance applications are commonly used to make amendments associated with the technology incorporated in the first patent. In other words, the applications are used to define and extend the technology incorporated in the original patent's claims while retaining the filing date of the original.

[115] Joint Electron Device Engineering Council Homepage, http://www.jedec.org. [hereinafter *JEDEC Homepage*]

[116] *Rambus*, 318 F.3d at 1085.

technologies (SDRAM and its successor DDR-SDRAM)[117] that included elements claimed in Rambus's pending patents. Though there is evidence that Rambus divulged some of its issued patents as early as 1993 to the committee, Rambus never officially acknowledged any of its pending applications, many of which incorporated elements of the DRAM technology and its progeny.[118] In fact, before the JEDEC adopted the DDR-SDRAM standard in 2000, Rambus had officially withdrawn from the JEDEC and had subsequently filed additional divisional and continuance applications that ultimately incorporated four of the technologies adopted in the DDR-SDRAM standard.[119] After these patents began to issue in 1999, Rambus enforced its intellectual property rights against the standards' adopters, including Infineon, a member of the JEDEC and a manufacturer of memory modules including SDRAM and DDR-SDRAM.[120]

2. Adjudication[121]

In defense of this infringement, Infineon claimed fraud against Rambus under Virginia law because the company failed to disclose to

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[117] SDRAM stands for synchronous dynamic random access memory, while DDR-SDRAM stands for double data rate-SDRAM.

[118] *Rambus*, 318 F.3d at 1085.

[119] *Id.* at 1085-86.

[120] *Id.* at 1086.

[121] The Federal Trade Commission also took notice of this duplicitous activity by Rambus Inc. and brought charges of exclusionary conduct under the Sherman Act and unlawful monopolization under the FTC Act. In re Rambus, Inc., No. 9302, at *3 (2006), *available at* http://www.ftc.gov/os/adjpro/d9302/060802commissionopinion.pdf (last visited Nov. 10, 2006). The FTC found voluminous evidence that Rambus understood how continued membership in the JEDEC would conflict with Rambus's own patent activities, and in fact expected this relationship to benefit the company's patent portfolio. *See id.* at *36-53. One particularly cogent example of this disregard for the ramifications of the company's actions came from an e-mail sent to Rambus executives from its representative on the JEDEC council, stating it was "unacceptable 'to not speak up when we know that there is a patent issue, to intentionally propose something as a standard and quietly have a patent in our back pocket we are keeping secret that is required to implement the standard and then stick it to them later (as WANG and SEEQ did).'" *Id.* at *44 (internal citation omitted). The FTC ultimately concluded that Rambus was guilty of "exclusionary conduct that significantly contributed to its acquisition of monopoly power in four related markets," and remanded the matter of remedies stemming from the company's prior enforcement of patent infringement against other companies to be decided in light of this ruling. *Id.* at *118.

the JEDEC the issued and pending patents related to the JEDEC's proposed standards.[122] The district court granted judgment as a matter of law for non-infringement to Infineon and tried the fraud counterclaim before a jury, which found Rambus perpetrated fraud on both the SDRAM and DDR-SDRAM standards.[123] The district court denied Rambus's motion for judgment as a matter of law on the SDRAM fraud conviction,[124] and upheld the same motion relating the DDR-SDRAM fraud conviction.[125] Both sides appealed.[126]

The Court of Appeals for the Federal Circuit reversed the SDRAM conviction and upheld judgment as a matter of law regarding DDR-SDRAM ostensibly on the same grounds. The Federal Circuit found the JEDEC's patent policy only required disclosure of patents and patent applications that a user would need to license in order to use the standard, not those that merely described the technologies under discussion by the JEDEC.[127] Thus, even though Rambus admitted to a subjective belief that the patent applications covered the SDRAM standard, the majority believed that this did not violate the JEDEC's rather nebulous policy standards.[128] The majority also remanded the decision of Infineon's non-infringement to the district court for further adjudication, where it is currently being

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[122] *Rambus*, 318 F.3d at 1086.

[123] *Id.* at 1086.

[124] Rambus, Inc. v. Infineon Techs. AG, 164 F. Supp. 2d 743, 755-56 (E.D.Va. 2001). The court felt that the jury could have reasonably believed that Rambus's mentioning of the PCT was insufficient disclosure because the application never referenced Rambus's intention to expand the application to include SDRAM, nor did any of Rambus's issued patents.

[125] *Id.* at 766-67. The court felt that there was insufficient evidence showing Rambus's involvement in the DDR-SDRAM's adoption because official work on its standardization began after Rambus had left the JEDEC.

[126] *Rambus*, 318 F.3d at 1086.

[127] *Id.* at 1100-01. *See also* Alban, *supra* note 109, at 324-25 (discussing the SDRAM and DDR-SDRAM patents and the duties of disclosure owed by Rambus).

[128] *Rambus*, 318 F.3d at 1104 ("Rambus thought it could cover the SDRAM standard and tried to do so while a member of an open standards-setting committee. While such actions impeach Rambus's business ethics, the record does not contain substantial evidence that Rambus breached its duty under the EIA/JEDEC policy"). Perhaps this behavior is not that surprising, for while "standards are taken for granted by end-users, they are deadly serious tools to the companies who stake their commercial success or failure on backing the right technical horse." Andy Updegrove, *Why you should care whether the Supreme Court intervenes in standards case*, MASS HIGH TECH: THE JOURNAL OF NEW ENGLAND TECHNOLOGY, Aug. 22, 2003, http://www.masshightech.com/displayarticledetail.asp?art_id=63372 (last visited Dec. 12, 2006).

adjudicated.[129]

3. The Patent Policy

In ruling against Infineon, the Federal Circuit relied solely upon Appendix E of the JEDEC's Manual of Organization and Procedure, which characterized the organization's patent policy as requiring disclosure of patents and patent applications only after the initiation of the formal standard-setting process, as opposed to discussion or suggestion periods.[130] The vague language in the JEDEC's Manual was one of the key factors in the Circuit Court's decision, which noted that "there is a staggering lack of defining details in the EIA/JEDEC patent policy."[131] The Circuit Court further stated that "[a] policy that does not define clearly what, when, how, and to whom the members must disclose does not provide a firm basis for the disclosure duty necessary for a fraud verdict."[132] The Federal Circuit's strict interpretation of JEDEC policy raises the possibility that other technology fields can and will be plagued by unscrupulous members,[133] as many SSOs in the early 1990s had similarly "skeletal and vague" intellectual property policies. [134] Though *Rambus* forced both emerging and established SSOs to revisit their patent policies and to adopt revised policies with expansive coverage for disclosure of patented technologies and pending applications,[135] the decision does

[129] *Rambus*, 318 F.3d at 1106-07.

[130] *Id.* at 1100. The relevant language from Appendix E reads: "Standards that call for the use of a patented item or process may not be considered by a JEDEC committee unless all of the relevant technical information covered by the patent or pending patent is known to the Committee, subcommittee, or working group."

[131] *Id.* at 1102.

[132] *Id. See also Updegrove Hard Cases*, *supra* note 109.

[133] *See Updegrove Hard Cases*, *supra* note 109.

[134] Interestingly, the legal and business fields have often adopted liberal interpretations of contracts such as those signed by members of a consortium, as "[c]ourts will (and regularly do) imply contracts from sufficient factual circumstances." Lemley, *supra* note 8, at 1911 n.71 (2002) (citing E. Allen Farnsworth, Contracts 3.10 (2d ed. 1990) (explaining that a contract may be formed "by spoken or written words or by other conduct;" those in the latter category are sometimes called "implied-in-fact" contracts)). This includes standard practices in the industry, though this case proves that relying on judicial interpretation of factual circumstances or customs is rarely predictable. *Id.* at 1911 n.72.

[135] "[M]any newly formed organizations have adopted state-of-the-art policies whose terms are informed by the lessons learned from prior legal decisions and the strenuous and public debates," while "[s]ome existing organizations have already stiffened their backs and slogged their way through updating and upgrading policies

not appear to be the last instance of obtrusive patents being embedded in widely-adopted computer standards.

IV. A MODEST PROPOSAL – PROPOSED ADMINISTRATIVE APPROACH TO SOFTWARE PATENTS: GRASSROOTS EXPERTS, WASHINGTON OVERSIGHT, AND THE OPEN STANDARDS CONUNDRUM

There is a palpable need for government oversight of the interplay between proprietary technologies incorporated into software protocols and their ascension to industry standards. At the same time, it is equally obvious that those "in the trenches" (e.g., boutique industry organizations and programmers in the industry) can keep pace with the rapid innovation in the industry far better than can a lumbering bureaucratic agency. The flexibility afforded by an informed membership can resolve disputes among software constituents more efficiently than the current system. Furthermore, the intellectually-open and global mindset of these members will assist in maintaining good relations with, and enforcement of these standards in, foreign countries. Thus, this paper proposes the creation of an SSO comprised of a diverse set of industry members that will possess de facto agency authority to define national standards for software and provide regulation and enforcement when applicable. Of note, conformity with the SSO's mandates will remain voluntary, in line with current industry practice,[136] but incentives will be in place to

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that were formulated, borrowed, or casually put in place many years ago when a spirit of cooperation and dialogue" was the norm. Andrew Updegrove, *What Does* Rambus *Mean to You?*, http://www.consortiuminfo.org/bulletins/feb03.php#editorial (last visited Dec. 12, 2006). [hereinafter *Updegrove Rambus Meaning*] Not surprisingly, the JEDEC has dramatically revamped its patent policy, requiring a "written assurance from the organization holding rights to such patents that a license will be made available to applicants desiring to implement the standard either without compensation or under reasonable terms and conditions that are demonstrably free of any unfair discrimination." JEDEC Manual of Organization and Procedure, § 8.2 (JM21-L 2001) (2002), http://www.jedec.org/Home/manuals/JM21L.pdf (last visited Dec. 12, 2006). [hereinafter *JEDEC Manual*] In addition, all committee members must adhere to the "requirements contained in JEDEC Legal Guides and the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking." *Id*. § 8.3.

[136] The purpose of standards, as opposed to rules, is to define a preferred manifestation or implementation in a field while still allowing adequate leeway for compliance based on the situation at hand. It is a safe assumption that any attempt to grant standards the weight of rules or laws would be met with immediate and

encourage acceptance. Furthermore, enforcement of these standards on members will increase in strength, most notably because of the legal repercussions for failure to adhere to the SSO's patent policy.

A. Who Represents the Industry?

Currently, membership in software SSOs is voluntary and non-discriminatory, with the only significant distinctions being yearly dues and patent policies. At one extreme are organizations like the IETF, a volunteer organization without dues or set membership whose altruistic goal "is to make the Internet work better"[137] by promoting equal participation in standard creation by any interested party.[138] Because the IETF was created prior to software patenting and membership has generally been coy about such matters, the IETF "takes no position regarding the validity or scope of any Intellectual Property Rights or other rights"[139] found in a standard, instead leaving the matter to the legislature.[140] At the other end of the spectrum, organizations such as W3C impose strict obligations on its members, requiring all to sign contracts allowing for royalty-free or RAND licensing of patents and to pay appropriate dues (which can be as much as $65,000 a year).[141] Though the organization welcomes all potential members, these stringent requirements certainly limit membership to a somewhat elite group of companies and those heavily invested in the Internet. At the same time, the contract makes enforcement of W3C's policies far easier and more robust, resulting in fewer instances of "hidden" patents in standards and a more defined

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indignant resistance.

[137] Harald Alvestrand, *A Mission Statement for the IETF*, Oct. 2004, http://www.ietf.org/rfc/rfc3935.txt (last visited Dec. 12, 2006).

[138] *See* Perens, *supra* note 78.

[139] Alvestrand, *supra* note 137, at 6.

[140] *See* Perens, *supra* note 78.

[141] Perens, *supra* note 78; s*ee also* W3C, *How to Become a W3C Member*, http://www.w3.org/Consortium/join (last visited Dec. 12, 2006); W3C, *Patent Policy Framework*, Aug. 16, 2001, http://www.w3.org/TR/2001/WD-patent-policy-20010816/ (last visited Dec. 12, 2006). Note that the recent adoption of a RAND licensing policy by the W3C was met with staunch opposition by developers of web-based software, who claimed that the policy "[had] the potential to block the development of interoperable Web standards." Carol Sliwa, *W3C readies new tech patent policy*, May 19, 2003, http://www.computerworld.com/development/webdev/story/0,10801,81309,00.html (last visited Dec. 12, 2006).

methodology if one slips through the cracks. [142]

It is this dichotomy in membership among agencies that must change in order for software standardization to evolve. As they are currently configured, SSOs tend to be dominated by a small fraction of prominent companies (e.g., Sun Microsystems, IBM, etc.) whose intentions stem as much from the pocketbook as from the interoperability and access professed for the organizations. By comparison, the vast majority of users and developers in the industry share a comparatively hushed voice, quieted by expensive membership dues, limited resources for consolidation, and a pervasive sense that standardization should be left to those with a pecuniary stake in the matter.[143] In a way this makes sense, as these companies create and possess much of the technology embodied in these standards, and thus share more "prominent" incentives in influencing the standardization process than "disinterested" programmers and developers who merely implement them.

Yet, this characterization overlooks the fact that because these users interact with the standards on a daily basis, they stand to gain the most from well-defined and patent-friendly standards, and suffer when the system devolves into a battle among 800-pound gorillas.[144] Furthermore, with the proliferation of software-centric websites, blogs, and message boards, and society's ever-improving technological literacy, the gap between the "informed gentry" (i.e. software companies, organizations, and experts) and the "proletariat" (i.e. users and developers) is rapidly narrowing. Because most SSOs' unintentionally limit membership to companies capable of fulfilling the financial and time requirements, the SSOs lose the invaluable knowledge of those "working in the trenches" and the impartiality they tend to display. In effect, these organizations are making the tools without asking the carpenters and mechanics if the tools are the best choices. Thus, any proposed standards agency must allow these ignored parties to be heard, or at least be fairly represented, both

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[142] *See* Perens, *supra* note 78.

[143] For example, the W3C membership list is a veritable "who's-who" of the software industry, including IBM, Microsoft, Google, Disney, and OASIS. W3C, Members, Oct. 22, 2006, http://www.w3.org/Consortium/Member/List (last visited Dec. 12, 2006). Conspicuously absent from this roll, though, are software user organizations or even individual parties.

[144] While many of these companies certainly entertain goals of advancing technology in a particular field, the fact remains that this ideal is tinged by the belief that "their" marketable technology meets this need best, a dogma that can be more anecdotal than objective.

during the formulation of a standard as well as the current practice of allowing scrutiny prior to ratification.[145]

1. Composition of the Agency

This proposed agency (henceforth referred to as FSSO, meaning Federal SSO) would be a hybrid of the NIST and the more industry-centric organizations such as W3C and ANSI. The FSSO's focus would be on providing the full spectrum of opinions and suggestions concerning a standard, not merely the interests of competitors. Since the organization would be a federal agency and voluntary,[146] barriers such as membership dues would be nonexistent and officials chosen by the executive branch would fill administrative positions.[147] These officials, who could not be employed by a lesser SSO or corporation involved in hardware or software, would be subject to the ethics disclosures and restrictions on conduct required of federal government employees.

In addition to these elected officials, the FSSO would feature a diverse work group of representatives from smaller SSOs in the industry and a collection of user societies comprised of individuals and companies not associated with an existing SSO. This latter group would most likely consist of professors, state and federal employees and officials, and other experts in a variety of software fields,[148] all with limited or no apparent pecuniary interest in a particular standard. As with current SSOs, this membership assemblage would propose the bulk of the standards and would work with the selected officials to effectuate their adoption. In addition, all members would be required

[145] For example, ANSI standards are publicly reviewed only when adoption is being sought, not during the formulation process. *See generally ANSI Introduction*, *supra* note 66.

[146] At first, this uncompelled membership might seem counteractive to the goals of a regulatory organization, since companies in the industry that did not agree with, or simply did not want to be governed by, the organization could refrain from joining and continue to sell their wares without restriction. While this concern is addressed later in the note, a key element of the FSSO would be the balance it struck between promoting new, affordable technologies for developers while protecting the intellectual property rights and marketability of the technologies' owners.

[147] By electing board members, the hope would be to insulate them somewhat from coercion or influence by industry politicking and interest groups. However, the idea is contingent upon officials culled from the ranks of the lower SSOs or universities.

[148] For example, this latter group would include individuals with expertise in encryption, databases, Internet, and file formats.

to join industry or technology-specific task forces within the FSSO; these groups would have the responsibility to design and submit proposals for new standards in that field for general adoption.[149] Each committee's chair would be a member of that committee elected by his or her peers, with certain administrative duties entailed in the position.[150] A member could join multiple task forces depending on his or her interests, but a majority vote could remove him[151] as a means to protect against companies increasing the odds of technology adoption by joining as many groups as possible.[152]

Such partnerships are not uncommon in federal organizations, particularly those in which public policy and societal concerns are intertwined heavily within the traditional oversight duties of the government. For example, the Environmental Protection Agency ("EPA") has a long history of "reach[ing] out to business, industry, trade associations, communities, universities, and state and local governments to solve environmental problems not generally addressed by laws and regulations," where regional expertise can bring about more efficient and timely remedies than by the EPA working alone.[153] In addition, many of the issues facing the EPA are urgently time-

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[149] This practice is quite common with a number of SSOs such as W3C and JEDEC, as it allows those parties that are the most knowledgeable and, more importantly, most affected by the standards to play a key role in the adoption process.

[150] For example, the chairs would oversee meetings, have the minutes taken, produce reports about committee decisions, break stalemates in voting, and serve as the representative of the committee to the greater FSSO membership.

[151] A simply majority (greater than 50%) or two-thirds (greater than 66%) would be the most logical, but alternatives are certainly possible. This power could also be used to remove members who fail to provide viable proposals over time, such as proposals with murky patent bases, compatibility issues, etc.

[152] In other words, a large company like Adobe would not be able to join a task force dealing with OS's because Adobe lacks demonstrable expertise and investment in that industry. Otherwise, Adobe could, at least in appearance, use its position to influence the group in favor of a business partner, not a superior technology.

[153] Environmental Protection Agency, Partnerships, http://www.epa.gov/epahome/partnerships.htm (last visited Dec. 12, 2006). For another example of federal-private cooperation, *see generally* Bureau of Industry and Security Technical Advisory Committees, http://tac.bis.doc.gov/ (last visited Dec. 12, 2006) "The [Technical Advisory Committees] are composed of representatives from industry and Government representing diverse points of view on the concerns of the exporting community. Industry representatives are selected from firms producing a broad range of goods, technologies, and software... [and] balanced to the extent possible among large and small firms." *Id.* The Technical Advisory Committees' chief duty is to formulate the best licensing and export practices for America.

sensitive, making it virtually impossible for the organization to mobilize and accumulate the necessary information to address a newly discovered toxic waste spill or contaminated aquifer, for example, without assistance from more knowledgeable third parties.[154]

For an example of this movement in the software industry, consider that the Patent and Trademark Office recently joined with the Peer to Patent Project, a brainchild of Professor Beth Noveck, to allow experts in computer software and hardware to provide prior art references against pending applications.[155] Under this system, once a pending patent application is published, people worldwide will be able to submit prior art references to a publicly-viewable website on which others will be able to view, edit, and identify the most relevant references for the examiner to consider.[156] As prior art is submitted, other users will rate the prior art, its submitter, and review the prior art's relevancy to the given claim.[157] After the requisite timeframe, the patent examiner will supplement her own research with the top prior art references as well as any comments attached to them by the community.[158]

The same concerns about local expertise and rapid response faced by the EPA would also exist for the FSSO, as it would deal with a broad spectrum of technologies evolving from the machinations of

[154] For example, the EPA's "Superfund" was designed to finance rapid clean-up efforts for "uncontrolled hazardous waste sites," many of which pose immediate danger to people and the environment. Environmental Protection Agency, What is a "Superfund Site?", http://www.epa.gov/superfund/programs/recycle/rtu/faqs.htm#2 (last visited Dec. 12, 2006). When one of these sites is located, the "EPA works closely with communities, potentially responsible parties (PRPs), scientists, researchers, contractors, and state, local, tribal, and other federal authorities. Together with these groups, EPA identifies hazardous waste sites, tests the conditions of the sites, formulates cleanup plans, and cleans up the sites." *Id.* In situations like this where speed is of the essence, partnerships with informed parties prove indispensable.

[155] USPTO Strategic Plan 2007-2012, available at http://www.uspto.gov/web/offices/com/strat2007/stratplan2007-2012_06.htm (last visited December 7, 2006); "United States Patent and Trademark Office to Implement Patent Reform Project Developed by New York Law School's Institute for Information Law & Policy", *available at* http://dotank.nyls.edu/communitypatent/pressrelease_082906.html (last visited Dec. 7, 2006).

[156] Beth Noveck, "*Peer to Patent": Collective Intelligence, Open Review and Patent Reform* 51-52, 53-55, *available at* http://dotank.nyls.edu/communitypatent/docs/openreview_sep_02.pdf, (last visited Dec. 6, 2006).

[157] Noveck, *supra* note 156, at 55-56.

[158] Noveck, *supra* note 156, at 56.

one or a few inventors, which no doubt would be shrouded in secrecy and confidentiality agreements until their public release. Without involving experts in that field, the FSSO would be trapped in a reactionary rather than proactive posture, lagging behind the curve and wasting valuable resources and time to play catch-up. This should not and does not represent wholesale reliance on outside personnel by the FSSO, as such release would likely devolve into the same agenda-driven conflicts afflicting SSOs mentioned earlier. Instead, by making use of already existing knowledge, the organization would be able to ride the wave of emerging technology and adopt it as soon as possible. This is especially important in the ever-evolving software industry, where delays caused by detailed FSSO research could lead to standards becoming obsolete before they gained acceptance.[159]

2. Consent of the Governed[160]

Of course, all of this camaraderie would be for naught if the non-governmental organizations and individuals involved in the FSSO felt that their knowledge and input fell on deaf ears. [161] As mentioned earlier, that is a key problem with both public and private SSOs, where adopted standards are sometimes perceived to be spurred as much by fiscal as by technological reasons.[162] If the FSSO did not address the current problem, there would be little reason for parties to join the agency; the FSSO would be virtually indistinguishable from those already in existence save for its federal affiliation. Rather, this FSSO would garner membership by: (1) allowing the *true* masses to propose

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[159] For a discussion of this rapid technological progress, *see supra* note 22.

[160] Originally found in the Declaration of Independence, this notion of authority and enforcement granted to a governing agency by the governed is one of the hallmarks of democratic society. *See* JOHN LOCKE, SECOND TREATISE OF GOVERNMENT (C.B. Macpherson ed., Hackett 1980).

[161] Peter K. Yu, *Intellectual Property and the Information Ecosystem*, 2005 MICH. ST. L. REV. 1, 12 (2005) ("Too often the interests of the 'producer' dominate in the evolution of IP policy, and that of the ultimate consumer is neither heard nor heeded. So policy tends to be determined more by the interests of the commercial users of the system, than by an impartial conception of the greater public good." (*quoting* COMM'N ON INTELLECTUAL PROP. RIGHTS, INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY: REPORT OF THE COMMISSION ON INTELLECTUAL PROPERTY RIGHTS, 7 (2002), *available at* http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf) (last visited Nov. 14, 2006).

[162] McKenzie, *supra* note 9, at 154 (A common complaint with SSOs being that they allow "one private consortium, which is made up of a subsection of the entire industry, [to] create the standards for the entire industry.").

standards, (2) recognizing equal voting power among FSSO members, (3) providing adequate protection against monopolization, fraud, and misrepresentation and, most importantly, (4) striking a common ground between promoting fair licensing of new technologies to users and protecting the intellectual property rights of the technologies' owners and the market potential of these rights. While these measures certainly would not insulate the FSSO completely from the abuse and inefficiency that exists with all SSOs, the measures would make the organization far more cognizant of these issues and proactive in remedying them.

a. Proposing a Standard

The first step in standardization for any SSO is soliciting and reviewing proposed standards, which tends to be time when the more powerful and influential members exert influence. Perhaps the most notorious example of this is Microsoft's dominance of the world's desktops, a supremacy that ultimately led to antitrust violations being levied against the Seattle-based giant.[163] For example, a 2002 report noted that Microsoft Operating Systems (OS) accounted for 93.8 percent of all client-side desktops,[164] and a 2005 survey showed that even with a number of competing browsers (Firefox, Opera, and Mozilla, among others), Internet Explorer still accounted for 85.5 percent of the worldwide market.[165] This preeminence, not surprisingly, allows Microsoft to exert substantial influence on software developers, as they must weigh the interoperability associated with writing code for the Microsoft platform against any concerns they may have about its quality and limitations.[166] This same

[163] United States v. Microsoft Corp., 253 F.3d 34, 46 (D.C. Cir. 2001).

[164] Laura Rohde, *Windows Dominates on the Desktop*, Oct. 8, 2003, http://www.pcworld.com/news/article/0,aid,112840,00.asp (last visited Dec. 12, 2006).

[165] Ingrid Marson, *Firefox achieves 10 percent market share*, Dec. 12, 2006, http://news.zdnet.co.uk/software/applications/0,39020384,39235378,00.htm (last visited Dec. 12, 2006).

[166] Though Microsoft has since made efforts to comply with public standards, its browsers have historically not been compliant with many standards, including W3C. *See* Will Rodger, *Intel exec: MS wanted to 'extend, embrace and extinguish' Competition*, Nov. 8, 1998, http://news.zdnet.com/2100-9595_22-512681.html (last visited Mar. 10, 2006) (In 1998, charging that Microsoft "hope[d] to 'embrace, extend and extinguish' competition by substituting the company's proprietary software for the public-domain, open technologies" in many of their products.); Paul Festa, *Developers gripe about IE standards inaction*, http://news.com.com/2100-

"800-pound gorilla" scenario plays out in virtually all other facets of the software industry, with most designers choosing interoperability and licensing in light of a stiff battle for acceptance of their products. SSOs must also deal with this issue, where interoperability between adopted standards is essential not only for technical reasons, but also for public perception.[167] Unfortunately, too often interoperability stems from de facto standards that arise from quality marketing as much as from superior technology, continuing the cycle of dominance that precipitated the standards. While the notion of a common symmetry of standards-sharing is a key goal of the new FSSO, the FSSO must derive these touchstones from the widest array of technologies possible. The FSSO can only accomplish this objective if every member of the organization is able to make credible proposals irrespective of the member's market size or lineage. Luckily, most SSOs actively encourage their members to promote new technologies for review, so this will not come as a major shock to the culture of these entities.[168] What will be startling will be the acknowledgement of proposals from all members, not merely those with the deepest pockets.

Of course, one of the key concerns with this open call would be a deluge of proposals, led by the most powerful and prominent members of the consortium. At worst, task force meetings would

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1032-5088642.html (last modified Oct. 9, 2003) (From 2003, in response to Internet Explorer's inability to comply with Cascading-Style Sheet (CSS) standards, developers note that "[b]ecause it owns the marketplace, Microsoft's under very little pressure to fix remaining IE 6 bugs[.]"); Paul Festa, *W3C members: Do as we say, not as we do*, http://news.com.com/W3C+members+Do+as+we+say%2C+not+as+we+do/2100-1023_3-956778.html (last modified Sept. 6, 2002) (noting that as of 2002, only 4.6% of W3C's member's products and sites complied with the web standards they adopted); *but see* Chris Wilson, *IEBlog: Standards and CSS in IE*, http://blogs.msdn.com/ie/archive/2005/07/29/445242.aspx (last visited Dec. 12, 2006) (A blog from a lead IE developer at Microsoft trumpeting the new version of Internet Explorer and its compliance with numerous standards.).

[167] For example, if an SSO like NIST's ITL did not maintain some consistency in selecting encryption standards for Internet transmissions, not only would members be wary about adopting a technology that could prove incompatible with the next standard, but the general user public would undoubtedly perceive the SSO as an inconsistent organization with little direction and unreliable standards practices. Even if each proposed standard encompassed technology that truly was "better" than the last incarnation, the skepticism and inconsistency that swirled around the technology would probably scare away most adopters.

[168] *See* W3C, Member Submission Process, http://www.w3.org/2005/10/Process-20051014/submission.html#Submission (last visited Dec. 12, 2006).

devolve into a glorified beauty contest, with each company shilling its products in lieu of focusing on the best technology available. While such a scenario could play out (and arguably does with many SSOs), the FSSO would have a number of safeguards in place in order to combat such an occurrence, most notably the ability to remove biased or unproductive members. With the recourse to removal and the inherent inability to influence standards affecting their own industry, companies would be far more cautious about their proposals. Another safeguard would be that, in lieu of the immense R&D, testing, and marketing costs for a technology, many members would either be unable or unwilling to invest in proposed standards, instead waiting for one to be adopted and then creating derivatives and enhancements for the market.[169] Thus, while only a handful of companies produce full operating systems (notably Microsoft, Apple, and Red Hat Linux) there are thousands of businesses responsible for the cornucopia of tools and software that run on their operating systems.[170] Finally, the sanctity of the proposal process would be buttressed by the universal voting powers enjoyed by all members.

b. Universal Voting

The right to popular vote is a bedrock of American society and, not surprisingly, is common among SSOs. As one would expect from the sheer number of SSOs and their varying practices, little uniformity exists pertaining to voting qualifications, voting procedures, and level of agreement (varying among uniformity, two-thirds majority, and

[169] While on paper this might sound simple, note that the terms for licensing these base technologies are some of the most scrutinized elements of an SSO's by-laws. "SSO IP rules have important implications for IP policy, particularly patent policy... it should be clear that we cannot design an optimal patent policy without paying close attention to how patents are actually used and licensed in practice. SSOs are a large piece of that puzzle." Lemley, *supra* note 8, at 1971. *See also* U.S. Dep't of Justice and Fed. Trade Comm'n, Antitrust Guidelines for the Licensing of Intellectual Property (1995), http://www.usdoj.gov/atr/public/guidelines/0558.pdf (highlights many of the issues SSOs must grapple with when defining their licensing policy) [hereinafter *IP Guidelines*].

[170] One of the key concerns of any company promoting or adopting a standard is that "[t]he competitors who have spent their time and money adopting the 'obsolete' standards will lose their sunk costs and will have to pay to license the new standard." McKenzie, *supra* note 9, at 155. The FSSO would combat this scenario by refraining from adopting any standard for a particularly competitive technology, allowing the market to adopt a de facto standard.

simple majority).[171] In general, most SSOs push their subcommittees and task forces to adopt proposals with uniformity or a substantial majority with few abstentions.[172] The minimization of dissent flows from the mantra of SSOs, which is to adopt the best technologies in the industry while remaining above the disputes that arise from pecuniary interests and competition.[173] Unfortunately, while compromise and uniformity may work with petulant children, there is simply too much at stake financially to expect many members of an SSO to reach such accords consistently. Instead, as the IEEE recently found out, "in some cases some standards lend themselves to corporate entity voting rather than individual voting."[174]

This commercialized voting is an inherent problem with any SSO that derives most, if not all of its membership from companies involved in the industry, especially when combined with yearly dues that place an even greater financial stake in the organization's decisions. In contrast, the FSSO will feature a substantial portion of its membership drawn from users and experts who do not have any direct corporate allegiances, as these members will be more capable of detaching themselves from the product's source and focusing simply on the best technology. Furthermore, these members will be granted the same voting rights as the corporate members, with the same "one

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[171] *See* W3C, General Policies for W3C Groups, § 3.4 Votes, http://www.w3.org/2003/06/Process-20030618/policies.html#Votes (last visited Dec. 12, 2006) (outlining the process and requirements for voting in groups, which should occur only if discussion and compromise fail to reach a consensus) [hereinafter *W3C Votes*]; Institute of Electrical and Electronics Engineers, Inc., IEEE Standards Association Operations Manual, § 6.3 Membership Privileges at 21 (2006), http://standards.ieee.org/sa/sa-om.pdf (last visited Oct. 22, 2006) (discussing various benefits and requirements of membership, including the ability to vote "on an unlimited number of proposed IEEE draft standards, and on the reaffirmation or withdrawal of existing IEEE standards"); *JEDEC Manual*, *supra* note 135, § 5 Voting (outlining when two-thirds and three-fourths majorities are necessary and affirms the "'[o]ne company, one vote' wherein all formal, binding votes will be restricted to one vote per company.")

[172] *See W3C Votes*, *supra* note 171, at § 3.3 Consensus; *IEEE Manual*, *supra* note 166, § 5.4.3.1 ("For a standards ballot to be effective, at least 75% of the ballots shall be returned. In the event that the 75% return from the balloting group cannot be obtained, the balloting process is considered to have failed.").

[173] A good analogy would be non-profit institutions, whose focus is less on the bottom line than on providing endowments and support for certain causes.

[174] Mark Hachman, *Could IEEE Voting Changes Break Tech Stalemates?*, EXTREMETECH, Nov 9, 2004, http://www.extremetech.com/article2/0,1697,1730403,00.asp (last visited Dec. 12, 2006) (quoting Eric Broockman, chief executive of Alereon and member of the Multiband OFDM Alliance).

company, one vote" limitation found in the JEDEC's policy.[175] While unity and compromise will always be sought, the official method for adopting a proposal will be through a formalized vote initially requiring a two-third majority of the committee's membership for ratification.[176] If a proposal fails to garner the necessary votes, committee members will provide suggestions to improve the proposal, and then the members will vote on the revised proposal. Since one of the goals of the FSSO is efficient adoption of standards, this process will continue only for a reasonable period of time,[177] at which point the required votes will drop to a simple majority.

Once the committee adopts a proposal, it will be presented to the general FSSO membership for ratification. The same voting scenario would apply here as in the committee, with ratification initially requiring a two-thirds vote, revisions being made to the proposal where possible, and a simple majority ultimately being required if the FSSO leadership faced a stalemate. Finally, since the FSSO adopts the standards, the standards would be published and made public for review. Parties would then have anywhere from 30 to 60 days to file grievances addressing perceived deficiencies with the standard, which could delay finalization of the standard depending on the severity of the complaint or fault.

c. Protection Against Fraud, Misrepresentation, and Hidden Patents

In addition to promoting "fair" standards that experience little

[175] In other words, if a user or expert is involved with multiple SSOs, user groups, and/or non-profit institutions, she will still be limited to a single vote. Just as with corporations, though, determining the degree of involvement and influence this user exerts over other members would be determined on a case-by-case basis within the FSSO.

[176] Many SSOs require that a quorum be established prior to any voting, and specify in their by-laws what constitutes a quorum. *See JEDEC Manual*, *supra* note 135, § 3.5 Quorum; *W3C Votes*, *supra* note 171 (specifies that a "group charter should include formal voting procedures (e.g., quorum or threshold requirements) for making decisions about substantive issues.") (emphasis in original). Because of the uncertainty in group size and composition, the FSSO would leave the quorum determination to the committee, which would specify it within its by-laws, similar to the W3C.

[177] This is a subjective standard that will be determined by the head of the committee, based on factors such as the number of revisions, the timeliness of the standard, and the feasibility and utility of these improvements in relation to the standard's purpose. In general, though, 30 to 60 days would be adequate.

outward commercial influence, this proposed voting system would also help protect both FSSO members and general users from the fraud and "submarine" patents[178] that give pause to all SSOs, exemplified in the aforementioned GIF and *Rambus* situations. While *Rambus* highlighted many of the flaws that existed in SSOs' patent policies and led to widespread hand-wringing, the case also cast a refulgent light on this long-overlooked element of the standard-setting process.[179] Instead of using boilerplate language for patent disclosure and optimistically expecting all members to comply, SSOs began to explicitly impose an "obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking."[180] SSOs have since become quite proactive in identifying and addressing this issue of disclosure of both patented and pending technologies, though this effort could be further improved.[181]

In line with private SSOs, the FSSO would have an explicit policy concerning patent disclosures, both issued and pending, but would improve on the existing policies with unambiguous language defining what a member must divulge to a committee and its members. Instead of nebulous terms such as "related to" or "involved with," the FSSO would use definitive language requiring a member to disclose "any patents or pending patents *currently* incorporated, or which *may*

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[178] Submarine patents concern a patented technology that is unknowingly incorporated into a product or standard, either because no patent had been issued at the time of the technology's adoption or the patent owner refrained from informing users of his claim, and then not found until the product has matured. *See* Perens, *supra* note 78. This practice is closely related to patent farming, in which a patent holder pushes the inclusion of a patented technology in a product or standard and, once it germinates, demonstrates ownership. *Id.*

[179] *See Updegrove Hard Cases*, *supra* note 109.

[180] *JEDEC Manual*, *supra* note 135, §8.3. *See also Updegrove Hard Cases*, *supra* note 109 (discussing how this case spurred many SSOs to reevaluate their patent policies).

[181] *See Updegrove Rambus Meaning*, *supra* note 135 (noting that the disclosure "specification...continues to be disturbingly common in the policies of many standard setting organizations today, some of which use words such as 'related to', 'involved in' and other formulations to a similar effect without establishing clearly what those words are intended to mean"). The W3C is an exception, though, as it has a very detailed process for adopting a standard, including a review by the Patent Assessment Group (PAG) for submarine patents and a strict policy of royalty-free licensing of any patented elements of an adopted standard. Perens, *supra* note 78. In fact, "W3C's policy is to withdraw a standard if a submarine patent affecting the standard is revealed and the patent holder is not amenable to royalty-free licensing." *Id.*

be incorporated in the future, in a proposed standard." This would not require the member to disclose proprietary or previously-unknown technologies that could injure the future value of the technology to the member. Instead, the FSSO would require members to discuss only enough of the technology as described in the proposal *and* enough to put other members on notice of its inclusion.[182] The policy's goal would be to provide notice as early as possible in the adoption process, and these disclosures would add to the transparency required under the APA of government agencies like the NIST.

In addition to this stringent disclosure, the FSSO would require that any patented technology incorporated into a standard be made available to users under a RAND license determined by the committee that made the proposal.[183] That way, the affected member would have a say in determining the value of the technology, the other members would be able to proffer educated suggestions (compared to a static licensing value irrespective of the technology or those suggested by members not familiar with the industry), and some consistency could be maintained since the same members would be voting in each instance. This monitored licensing would also prove useful in enforcing the disclosure requirement, since the FSSO would impose liability irrespective of whether the company disclosed the patented technology prior to the standard's adoption. That decision, though, would have ramifications during the licensing deliberations, when the committee could punish the offending member by licensing the technology at a reduced rate or for free, depending on the egregiousness of the offense. Beyond this financial safeguard, offending members could be removed from a committee by vote, and since members of the FSSO would be required to sign contracts acknowledging the policies of the FSSO, could be held liable for contract violations as well as additional torts. Finally, because members would be involved in a governmental entity and would be subject to statutory rules, criminal charges could be brought against the members in extreme circumstances, similar to those imposed by the Department of Commerce's Bureau of Industry and Security.[184]

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[182] In other words, if member X has a pending patent on a database protocol incorporated in a proposed database standard, the member would be required only to divulge its existence and its role in the standard. The member would not be required to make its internal operations or code publicly available until the patent was issued.

[183] For a sizable list of SSOs and their licensing policies, *see* Lemley, *supra* note 8, at 1973-75 (Appendix).

[184] *See* Bureau of Indus. and Sec., U.S. Dep't of Comm., Export Enforcement, Prosecuting Violators,

d. Bringing It All Together: Joining the FSSO

With strict disclosure requirements, robust voting rights, and stiff penalties for non-compliance, what incentive would a company have to join the FSSO compared to any of the less-stringent but equally-relevant private SSOs? Though an answer exists, it depends on the member's size, goals, and willingness to cede some authority to the agency. Furthermore, since membership in the FSSO would be voluntary, a party could simply opt not to join. That said, the FSSO would provide options comparable to those offered by private SSOs, as well as benefits that can only be supplied by a governmental agency.

For smaller companies or even single entities, the FSSO's "one party, one vote" system would provide a sense of protection from oppression and control that does not always exist in other SSOs, where larger companies are able to impose their will simply based on their size and number of subsidiaries. Under the FSSO, Microsoft, for example, would have the same number of votes in adopting spreadsheet standards as Dan Bricklin, the inventor of the spreadsheet.[185] This might be troubling initially, as a single user could cancel out the vote of the biggest player in software. However, the strict requirements imposed on membership, as well as the lessened voting requirements in the event of a stalemate, should help mollify these concerns. Along those same lines, the ability for any member, irrespective of size or pedigree, to propose a standard would likely galvanize users to invent and bring these ideas to market. Instead of being silenced by the larger companies who tend to overlook the technology's benefits in lieu of market considerations, the smaller companies would at least have the opportunity for their product to be considered as a standard. In combination with the voting system, these new technologies would have a chance for adoption, stimulating creativity and progress in the industry while providing some equality in an otherwise market-driven industry.

Another advantage of the FSSO for smaller companies would be the protection the agency provides them from the hidden patents

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http://www.bis.doc.gov/ComplianceAndEnforcement/EnforcementHome.htm (last visited Dec. 12, 2006) (outlining punishment for violating federal laws associated with exportation of technology, including up to 10 years in prison and $1 million in fines per offense).

[185] For a brief discussion of Bricklin's accomplishments and current research and development, *see* Dan Bricklin, Dan Bricklin's Web Site, http://www.danbricklin.com/ (last visited Dec. 12, 2006).

and licensing issues that arose in connection with GIF and *Rambus*. While large companies tend to pay just the licensing fee and continue to use the standard, these smaller entities may not have the resources to do so. With the FSSO's licensing requirements, the smaller users would have the ability to mold the fees to a manageable amount and, hopefully, still be able to use the technology in the future. Plus, the lowered fees would make it possible for smaller developers to gain access to technologies the developers may not be able to afford otherwise, which would no doubt spur derivative developments.

As for the larger companies, the FSSO offers the possibility of substantial market growth if their standard is adopted, as it would then become the "official" standard adopted by the federal government.[186] Both public and private parties would undoubtedly be amenable to utilizing the standard in their business, especially if the standard is an essential tool such as data encryption. While this might lead to cries of antitrust violations and collusion between government and private entities, the transparency of the FSSO and its freedom not to adopt any standard at all in particularly competitive markets would certainly be relevant. As for the voting system, while it might injure the company when it is seeking adoption of its standard, it can also be a powerful weapon against a competitor, as it gives the company a chance to halt a monopoly before it might materialize. Additionally, from a somewhat Utopist mindset, the adoption of the best technology should probably fall to those who use it every day, the relatively-impartial users and small developers in the FSSO.

Finally, the disclosure requirement could actually benefit these larger companies because it would provide them with the same protection from submarine patents as the users, while at the same time not require overly-broad disclosures of their patent portfolios. Thus, the possibility of an *Eolas*-style[187] scandal rocking a company like Microsoft, which would naturally be a target of those hoping to cash in on a patented technology adopted by a giant, would be greatly diminished. Because these larger companies would be licensing the technology in the same way as all other FSSO members, the price

[186] This would immediately open the door for governmental adoption under the National Technology Transfer and Advancement Act of 1995, which requires the federal government to use non-proprietary technologies adopted by SSOs. *See* National Technology Transfer and Advancement Act of 1995, Pub. L. No. 104-113, 110 Stat. 775 (1996).

[187] Eolas Tech., Inc. v. Microsoft Corp., 2004 U.S. Dist. LEXIS 534 (N.D. Ill. 2004), *vacated in part*, 399 F.3d 1325 (Fed. Cir. 2005), *cert. denied*, 126 S. Ct. 568 (2005).

would be less than on an individualized basis, while at the same time costly litigation would be eliminated. As for required disclosures, the larger companies are already likely to be under intense scrutiny due to their prominence, so little if any new knowledge could be culled from the limited information they would divulge.

V. CONCLUSION

As the legendary football coach Bill Parcells once said in response to a perceived inability to draft players he wanted for his team, if "[t]hey want you to cook the dinner, at least they ought to let you shop for some of the groceries."[188] A similar statement can be made about the current standard-setting process in the computer industry, where prominent corporations exert immense influence on both public and private SSOs to adopt their products as standards, forcing users and, at times, developers, to passively accept the standards or risk non-interoperability. Though this system has proven adequate in most instances, it has done so in spite of some glaring issues that have hampered its efforts to provide true industry input. Thus, while this proposal for a true public SSO with government powers and regulations may at first appear a mere pipe dream, the fact remains that it would remedy a number of the chief failings of the current regime while still providing enough flexibility to address any present or future concerns.

[188] Upton Bell and David Chanoff, *Settling the Score*, BOSTON MAGAZINE, Dec. 2001.