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## THE OPEN COLLABORATION REVOLUTION

**EDITOR'S NOTE:**     [All for One and One for All](#) .....3  
For centuries, the life of the author, inventor or researcher has largely been solitary rather than collaborative. Just another one of those cases where the Internet really is changing everything.

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The full potential of the Internet to act as a platform for the sharing of content and information is only beginning to be explored. Many are embracing that potential, using creative tools such as Creative Commons and open source licenses. Others would circle the wagons to prevent their content from being more widely reused than in the past. It may be that they have the most to lose if they are successful.

**FEATURE ARTICLE:** [“Openness” and the Pursuit of Knowledge](#).....8  
Until the advent of the Internet, the acquisition of knowledge was a slow and linear process of discovery/review/publish/read and start the cycle once again. The legal system that evolved to support that process ranked the rights of creators over users, because society lost little in the bargain. Today, the Internet has upset that equation, and creators of all types are voluntarily relaxing their ownership rights in order to mutually enjoy the benefits of greater access, faster development, and more useful collaboration.

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Standards are the bullies of the design world, always telling every other part of a plan what it has to do. But everyone has a boss, and even standards sometimes have to kowtow to an Alpha Standard.

## EDITOR'S NOTE:

### All for One and One for All

In the [last issue](#) of **Standards Today**, I proposed the need to recognize what I called "Civil ICT Rights," which I defined as our traditional civil rights, as increasingly expressed virtually on line through information and communications technology (ICT) rather than physically and face to face. I also suggested the need to recognize the special status of the "Civil ICT Standards" needed to secure those rights.

In this issue I return to the topic of virtual expression, this time focusing on collaborative rather than individual expression. In this case, technology has provided not just an expanded reach, but a more fundamental renaissance, as communities can, and are, coalescing nationally, regionally and even globally, allowing knowledge to be shared used simultaneously rather than sequentially. The result has been an explosion of interest in "openness" of every type – in standards, in software, in hardware, in development, in content, and more.

The benefits that can be gained from such openness are bringing about a reconsideration of the proper balance to be struck between the rights of those that create and those that consume. Happily, it is the creators that are leading the drive to reset this balance, because of the gains that they can reap from this new spirit of collaboration.

I begin this examination in my **Editorial** by noting the degree of creative ferment that is ongoing in the marketplace, and suggesting that the legal system should allow this process to continue rather than try to codify its conclusions at too preliminary a state.

I do a deeper dive in this issue's **Feature Article**, placing the drive towards open collaboration in historical context, and providing an overview of the many types of open methodologies and subject matter that are being actively and enthusiastically pursued today.

The **Standards Blog** selection for this month provides a bridge between this issue and the last, announcing a human rights statement entitled **The Hague Declaration** that was issued this month by a new non-profit organization of which I am proud to be a co-founder. That organization is called the Digital Standards Organization (Digistan.org for short). You can read more about Digistan and its mission [here](#). The Hague Declaration calls upon governments everywhere to recognize Civil ICT Standards (the Declaration refers to them as "free and open standards"). Hopefully, governments will heed this call to give special treatment to those "alpha standards" upon which our human freedoms rely.

I round out this issue, as usual, with the latest installment of the **Consider This** series, which focuses on the concept of “alpha standards” from a different, and less serious perspective.

As always, I hope you enjoy this issue.

Andrew Updegrove  
Editor and Publisher  
2005 ANSI President's  
Award for Journalism

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## EDITORIAL:

# Patience and the Possibilities of Collaborative and Derivative Expression

Andrew Updegrove

Human cultures have deep roots, put down across millennia of shared experience. Over time, societies develop detailed systems of law, morality and social conduct to protect those cultures, and these frameworks properly adapt only gradually over time. In some cases, changes are enacted self-consciously (as with law), while in others they occur organically (as with evolving norms of social conduct), but in neither case are they apt to morph abruptly.

That is, until now. Increasingly, fundamental and sustaining changes are occurring in the world around us that are comparatively sudden, and therefore present greater challenges to existing systems. Because the cumulative effect of changes that occur deliberately and slowly tends to go unnoticed, we may be tempted to think of abrupt change as being, at best, a necessary evil.

And indeed, much change can be unwelcome and daunting, such as the need to deal with the pressures of increasing population and decreasing natural resources. But other transitions can be liberating and beneficial - although still daunting to embrace. When this happens, we face the dual task of applying the strengths of our historical systems and values to address new realities, while at the same time resisting our predisposition to allow historical biases to stand in the way of embracing the opportunities of the future.

One such liberating and beneficial opportunity I will call the greatly expanded potential for "collaborative and derivative expression" made possible by the Internet. By this I mean the ability to not only share and build upon ideas, but for trans-national, self-selecting communities to form to collectively instantiate them, often incorporating the work of others as quickly as those modules are created. The result can be discrete works (e.g., source code projects involving from a few individuals to thousands of developers), or more diverse, affiliated works of authorship (such as the Wikipedia, with its increasing number of largely independent language editions). Any of these efforts would have been impossible to imagine as other than geographically local, slower moving projects in the very recent past, if indeed they would have existed at all.

New opportunities, of course, are apt to raise new questions. Looked at from the outside in, if a project does not carefully record the authors of discrete contributions, who can or should be held liable for infringement or libel if unauthorized reuse occurs or defamatory statements are made (and if the answer is no one, then who can be protected from such acts?)

Viewed from the inside out, other issues emerge: who should own works of collective expression in order to maintain them into the future, and how? Are the rights of free speech of those that contribute to works of collective expressions in any way different or weaker than those of the sole author of a work of self expression? Should the rules governing fair use under copyright law be more liberal when creating Web-based, interactive "mashups," simply because the Internet enables far richer opportunities for expression than were conceivable in a world possessing only printed pages?

And in each case, absent amendment by legislatures or reinterpreting in the courts, will existing laws dictate the "wrong" answers - answers that over restrict and under deliver?

To derive the best answers to questions such as these, it is important to recognize that virtually all rules that restrict human behavior involve a balancing between the rights of the individual and those of society. In short, the specifics of many laws have been determined not empirically and universally, but subjectively and situationally, based upon the assumption that a certain amount of benefit can be gained (or harm avoided) by society in exchange for imposing a certain degree of restriction on the individual. When the facts underlying such equations change, it becomes appropriate to reexamine whether the location of the legal boundaries that evolved in the past should be relocated to better serve the best interests of all concerned in the future.

Is now such a time? The answer is both yes and no. Yes, because the benefits of both collaborative and derivative expression are becoming obvious. But also no, because the exact new locations for such historical boundaries is not yet obvious. Instead, what is most needed is patience and forbearance on the part of the traditional owners of rights in intellectual property and those charged with protecting those rights, in order to allow the rich and rapid experimentation that is ongoing today in a wide variety of projects and settings to continue.

Such patience, I believe, will be well rewarded. What we are seeing on a daily basis today is a fascinating process of organic adaptation as the marketplace explores new models. Many content owners, at first concerned by the ease with which their content can be copied, are learning to benefit from this same activity. Others are willingly embracing free and open source software licenses, Creative Commons licenses, and open content publishing models that use existing laws as a means to encourage reuse of the fruits of their labors rather than to tax or discourage such use. The result is a creative ferment of collaboration, innovation, advancement and opportunity for all concerned.

If this exploration is too tightly restricted by new laws, or if courts too strictly apply old laws, this process could be inhibited, or, worse yet, brought to a halt entirely. That would be a great tragedy, as the Internet has already proven itself capable of providing an unparalleled vehicle for sharing knowledge, creativity and opportunity.

Disruptive technologies, by definition, stir the pot, upsetting the status quo and applying stress in areas where all may have seemed in balance. Until things once again settle down, that stress may be extremely unwelcome and painful. But attempts at putting the genie back in the bottle are rarely successful. Moreover, the wishes that are within the power of the same genie to grant can be lost as well.

Clearly, the Internet has much more to deliver than we have yet to experience, or perhaps even guess. Where it will take us can hardly be presumed after so few years of wide use. With so much promise, it is certainly too early to set the promise of the future in the concrete of comprehensive laws enacted today. Indeed, it may be that if traditional content owners press too hard to protect their traditional rights rather than join in the creative exploration of this far larger stage, they may lose the most of all.

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## FEATURE ARTICLE:

# “Openness” and the Pursuit of Knowledge

Andrew Updegrave

**Abstract:** *Until the advent of the Internet, the acquisition of knowledge was a linear process, with the discoveries of one innovator only becoming available to be built upon by the next after being reported to, evaluated by, and eventually published in a journal of repute. Similarly, the process of creation of collaborative works was largely limited to individuals that were physically in one location, due to the need for real time communication. Not surprisingly, the legal rules, tools and practices that evolved over time reflected this sequential and insular process of creation, tilting the balance of rights towards the creators, in part because the opportunities for societally beneficial, real-time sharing were limited. Now that those limitations have fallen away, creators of all types are voluntarily relaxing their ownership rights in order to mutually enjoy the benefits of greater access, faster development, and more useful collaboration. In this article, I review some of the many ways and domains in which this revolution is occurring, highlight some of the legal tools that innovative individuals have created in order to facilitate this process, and offer thoughts on how these important developments in the acquisition and sharing of knowledge can best be encouraged to thrive in the future.*

**Introduction:** Throughout human history, the expansion of knowledge has been linear and accretive: in pre-history, individuals acquired and shared information, and to the limited extent possible passed that knowledge along to the next generation. But since knowledge could not be recorded, it was at constant risk of loss or corruption. Moreover, this dependence on oral transmission limited the complexity of knowledge that could be transmitted through the “lowest common denominator” of understanding of each human link in the chain. Impressive advances could be easily lost – as occurred 50,000 years ago, when the descendents of the first humans to reach Australia lost the technology to make sea voyages. Some of their descendants, settling on isolated islands off shore from their new home, even lost the ability to make fire.

The invention of writing crucially allowed knowledge to expand much more rapidly, since discoveries could now not only be preserved in faithful detail and built upon by others, but also shared more widely across both space and time. Moreover, because the peoples that used writing also lived in town-based, hierarchical societies, classes of people now existed with the desire and time to learn. With some of the best minds of the times now able to stand on the shoulders of their predecessors, and in turn “speak” to the best and the brightest of the next generation, the increasing pool of knowledge could be utilized to create much more complex types of learning based upon abstractions, through reasoning and inference. Wars and catastrophes could still set knowledge back dramatically within any single society, but with the dispersion of knowledge there was greater

likelihood that some of the unique discoveries of one culture would be communicated to another, sustaining society linked through trade or alliance. The result of writing and communication was therefore that the preservation of knowledge had at last become less ephemeral, and the capacity to create new knowledge more robust.

Though the process of knowledge creation and preservation now led to great advances in complex disciplines such as mathematics, philosophy and astronomy, the process of advancement remained largely linear, slow, and accretive. This, because the utilization of information beyond small communities of scholars remained mediated by the need to write down and then physically transport the results to those that might take the next intuitive leap. The use of Latin (in the West) and Arabic (in the Islamic world) facilitated the sharing of ideas across international borders, but the limited travel infrastructure of the day ensured that even this process remained painfully slow.

In the modern era, advanced transportation systems began to hasten knowledge exchange, as postal systems became more reliable and swift, and as more scholars and experts could travel farther and more frequently to exchange and debate the fruits of their research first hand. With the invention and deployment of modern voice-based telecommunications technologies, verbal exchanges of summarized data, if not detailed research, became possible as well.

While these changes were historically dramatic, their impact was evolutionary, rather than revolutionary, since the exchange of information between geographically separate researchers and thinkers in the same disciplines was still likely to be occasional and episodic, rather than constant and seamless. As a result, researcher B would usually not have full access to the discoveries of researcher A until A's research had been submitted, evaluated, edited and at length published in a scientific journal, unless both A and B happened to be in trusted, personal communication. Thus, while the fidelity and range of knowledge transmission increased, the cycle of its reuse remained painfully slow.

A less obvious limitation of the technologies of the times was the impracticality of assembling collaborative communities across distances that could work on the same projects simultaneously. Those with the knowledge and ability to achieve impressive results through collaboration were thus constrained to work in comparative isolation, sometimes unknowingly working on the same problems, and even conducting the same experiments, that others were tackling at the same time. This separation encouraged rivalry rather than collaboration, further inhibiting the free exchange of discoveries until primacy of discovery could be established through disclosure in a respected journal.

Similarly, the roles of research and development remained largely separate, in part because those trained in the exploitation of new ideas were not likely to be direct participants in the types of communities that engaged in pure research.

With the advent of the Internet and the Web and the increasing adoption in the wired world of English as a successor to Latin and Arabic, many of these age-old logistical constraints have fallen away. Today, it is possible for individuals from

around the world to form communities large and small that are able to not only immediately share facts, research, insights and hard results, but work concurrently on the same projects as well. The benefits of such real-time access to valuable data has encouraged many in the scientific community to become more open in consequence. It has also allowed communities of like-minded individuals to form that could never have reached critical mass in the past, when the pool of similarly interested and skilled individuals from which such a community could be formed was limited to those in geographical proximity.

In this article, I will describe some of the ways in which both individuals as well as these new technically enabled communities are transforming the ways in which knowledge is acquired and shared. More importantly, I will explore how the promise of these Web-enabled processes is providing incentives to adjust traditional ideas regarding the proper balance to be struck between the intellectual property rights (IPR) of individual owners and those of collaborative communities and end users. Finally, I will review some of the new legal tools and organizational structures that have been created in order to more fully realize the revolution in knowledge sharing and advancement that modern telecommunications technologies make possible.

## **I The Needs of Linear vs. Real-Time Processes**

***Laws for a linear process:*** For most of historical times, there was no need for a legal system to protect IPR, because even if the labors of creation were great, the benefits to the creator were often low. For example, in the academic world, recognition as the originator of a discovery or theory conveyed status and opportunity, but that value could be secured simply by providing a means whereby recognition as the first to discover could be established. This could be accomplished through presentation of papers at meetings of scientific societies, and through publication in journals.

Where value was greater, as in the case of manufacturing processes, rights to practice inventions for many years was protected simply through secrecy, enforced either individually, or collectively, in guilds.

But as an industrial society began to take shape, greater profits could be lost if imitators unsaddled by the costs of research and development could swiftly and cheaply “knock off” the easily understood physical world inventions of the times. In the case of works of authorship, expanding literacy rates increased the market for written materials dramatically, a need which advances in printing technology easily satisfied. Predictably, literary piracy became rampant.

The result was the development in modern times of legal systems that were concerned primarily with protecting the rights of innovators, inventors and authors, as compared to competitors and consumers. Still, in the case of inventions and works of authorship, there was recognition that the benefits to society of unfettered use were sufficiently significant that the control granted to inventors and authors over their creations should be finite rather than perpetual, with the period of

exclusive enjoyment to be somehow appropriate to the labor and creativity invested.

The rights given to creators and inventors among the various forms of intellectual property also took into account the unique characteristics of the works in question. In the case of patents and copyrights, limits were imposed on the duration of the owner's right to exclude others from free use of their invention, idea, or work. Patent rights were assigned the shortest period of enjoyment, because the scope of the protection is most broad, representing a state-granted monopoly to practice the concept of an invention, rather than to produce a single, specific implementation of the innovation.

The exclusive publication rights granted under copyright are much narrower, protecting only the actual expression of the author (e.g., the words themselves, as compared to the underlying ideas), and the duration of exclusivity protected by law was therefore permitted to be longer. But even in the case of a novel, poem or essay, law makers decided that unfettered republication rights must necessarily pass eventually into the public domain.<sup>1</sup> In contrast, it was deemed appropriate for the exclusive rights in a trademark or service mark to be perpetual, because the cost to society of granting such exclusive rights is low. Still, there are limitations on the specific words that can become a trademark or service mark,<sup>2</sup> and the rights secured by a mark are also limited to the domain in which the product or service is actually offered (e.g., computer software).

Over time, the laws that evolved to reflect this balancing of interests has become increasingly uniform throughout the world. This was achieved through the refinement and wide adoption of a succession of treaties that apply to the principle forms of intellectual property recognized at law today (copyright, trademark and patent). These international agreements that treaty parties conform their internal laws to the requirements of the treaty (e.g., the Berne Convention) and may also mandate the enforcement of those same laws against infringers (e.g., the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), which is binding on members of the World Trade Organization (WTO)).

In the main, this legal regime has served developed nations well, and emerging nations therefore generally fell in step as they joined the global economy, adopting the same legal concepts, and with time, becoming party to many of the same treaties. At the dawn of the Internet era, the IPR legal infrastructure could therefore be viewed as a comprehensive, relatively mature global system, well

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<sup>1</sup>The duration of a copyright depends in part on the nature of the work and other factors, and is additionally complicated with respect to individual works by changes to the copyright laws over the years. Most recently in the United States the duration of a copyright was lengthened by 20 years under The Copyright Extension Act. That legislation was responsive to the vigorous lobbying efforts of major content owners, and particularly of the Walt Disney Corporation, the owner of a certain iconic cartoon character that was in imminent danger of falling into the public domain. The Copyright Extension Act therefore stands out as one of the clearest examples of truly "Mickey Mouse legislation."

<sup>2</sup> For example, a trademark may not be merely "descriptive." Otherwise, a cutlery vendor (for example) might trademark a word such as "knife," leaving its competitors with no way to identify their own competing products. In contrast, a trademark may be "suggestive" of the nature or virtues of a product, allowing a knife to bear a trademark such as "Chef's Delight."

attuned to the slowly evolving realities, values and needs of the societies the framework had been created to serve.<sup>3</sup>

**The digital challenge:** The legal framework we know today evolved to serve the needs of a physical world, however. Those active in the virtual world soon found that the licenses and practices that had developed in the past seemed too constraining to serve the types of activities in which they were now technically able to engage. For example, the ability to place works of authorship on line and allow them to be manipulated collaboratively from anywhere in the world presented both opportunities as well as new issues. Such behavior had never before been contemplated in a world where single authors created complete works that were then referenced in the writings of later authors. Not surprisingly, copyright laws were in some respects at best unhelpful, and at worst limiting.

Moreover, some communities that began to form around Internet-enabled opportunities reached different conclusions about what should change, and how. This was due in part to the fact that the range of subject matter opportunities was so broad (e.g., computer code development versus scientific research), but also because the motivations of the individuals that most publicly framed the resulting dialogue varied widely as well. In many respects, this dialogue assumed the need and the justification to revise the traditional balancing of rights between IPR owners and IPR users.

The result has been a still-emerging, and often spirited, debate over whether existing IPR laws need to change. At the same time, there has been a dynamic process of reapplying existing laws in new and often imaginative ways, in order to adapt the existing rule set to meet the needs and opportunities of our increasingly on-line world without the need for amending underlying laws at all.

## II The Open Revolution

At the heart of this modern revolution in thinking is the concept of "openness." While this still-evolving term has come to mean different things in different contexts (and often even within the same context, depending upon who is providing the definition), at minimum it recognizes that a greater good can be achieved through the simultaneous or early sharing of information than by keeping it secret until formal publication, in the case of research, or perpetually, in the case of source code or other technical information. Often, it also includes free and unrestricted rights of reuse, for some, or for all purposes. The methodologies and legal tools that have been created to achieve these goals are therefore directed at enabling a greater degree of visibility, access, and reusability than in the past.

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<sup>3</sup> "Relatively mature" does not mean "final." For example, the [World Intellectual Property Organization \(WIPO\) Copyright Treaty](#) was adopted on December 20, 1996. It has since been implemented in varying forms in signatory nations such as the United States (in the [Digital Millennium Copyright Act](#), or DMCA) and in the European Union (in [Directive 2001/29/EC](#) of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society). This evolutionary process will undoubtedly continue.

The following is a sampling of some of the more prominent “open” methodologies and rule sets that have arisen in the wake of the digital revolution:

**Free software:** The concept of “free software” was conceived by Richard Stallman in 1983, before the Internet became widely used by other than academics. As proposed by Stallman, the designation “free” refers to freedom of access and reuse rather than a requirement that such rights be conveyed at no cost (although in fact most such software is also made available free of charge).<sup>4</sup> This distinction underlines the fact that something new is at issue here, rather than the traditional concerns that copyright was intended to protect. Instead of seeking to protect rights of economic exploitation, the rules that apply to free software are intended to ensure what amounts to rights of common ownership, largely independent of economic motivations. As a result, these rules are intended to guarantee the rights to use, copy, study, modify, and to share the original and any modified versions of the software in question with others.

In a sense, the software code is considered to be less a work of authorship, than a collection of ideas that can be shared, evolved and built upon, just as knowledge and research has traditionally been shared in academic circles. Intriguingly, copyright law has been repurposed to help create licenses to assure this new set of goals. That said, it is important to note that the concept of free and open software relates to the rights of developers and technically savvy users rather than everyday users that are not technically able to enjoy the rights that free software embodies.

The goals embodied by free software were codified in the “Four Freedoms” that Richard Stallman proposed and the Free Software Foundation published as a definition of free software in 1986. Those freedoms, with introductory explanation, are as follows:

Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it refers to four kinds of freedom, for the users of the software:

- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.<sup>5</sup>

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<sup>4</sup> Perhaps as a reflection of the settings in which revolutionary concepts are often conceived, this distinction is invariably articulated as follows: “free (as in speech), not free (as in beer).”

<sup>5</sup> The application of this definition in practice can be quite complex, as indicated by the supplemental notes that accompany the free software definition at the Free Software Foundation Web site, which can be found [here](http://www.gnu.org/philosophy/free-sw.html): <http://www.gnu.org/philosophy/free-sw.html>

The purpose of these rules is novel: in terms of more traditional works of authorship, it would be as if an author of a short story wished to allow any reader to rework her story and then share it with others – or even sell it – provided that those she sold it to were permitted the rights to do exactly the same thing. In short, the definition first specifies a very broad set of freedoms, but then imposes a set of restrictions on the recipient of those freedoms, in order to ensure their extension to others.

The utilization of this definition was intended to create a sort of public commons of software. That goal has been impressively achieved, in part because unlike many types of historically shared property, free software is protected by licenses that prevent the public engaging in the type of behavior that too often results in the “tragedy of the commons” (that is, a tendency among those entitled to share in the commons to overexploit it for their own advantage until the resource is exhausted, before someone else does). A free software license is therefore self consciously both a social contract as well as a set of legal rules.<sup>6</sup>

**Open source software:**<sup>7</sup> Open source software embraces most of the same objectives as free software, but emphasizes its attributes in a somewhat different fashion. Like the Free Software Foundation, there is a non-profit organization (in this case the Open Source Institute<sup>8</sup>) that controls the definition of open source software, and which also maintains a (near identical) list of licenses that OSI has approved as meeting its own definition. These licenses provide a wide range of rule sets from which a developer may choose when making software available.

**Open hardware:** In a few cases, “open hardware” is also being created. Current examples include semiconductor designs (Sun’s SPARC architecture and the Power.org architecture)<sup>9</sup> and even mobile telephone handsets (OpenMoko is creating a line of fully open source mobile phones, based upon both a mobile Linux operating system as well as handsets of its own design).<sup>10</sup>

**Open development:** Just as vendors realized long ago that open standards could help create larger markets faster, platform vendors are now realizing that making their platforms as open as possible can foster the development of a wide range of products and services by independent software vendors (ISVs) to the mutual

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<sup>6</sup> The novelty of the goals propounded by Stallman are reflected in the name he gave to the license intended to secure his four freedoms, which he named a “copyleft” license. The most prominent copyleft license is the GNU General Public License (GPL), utilized by Stallman’s GNU project, and thousands of other software development projects around the world, including the Linux kernel. Version 3 of the GNU Public License was released in 2007 after extensive input, discussion and debate.

<sup>7</sup> There are various nuances and variations in the terminology used to describe open software, including “free and open source software” (FOSS) and “free/libre open source software” (FLOSS).

<sup>8</sup> OSI was founded in 1998 by Bruce Perens and Eric S. Raymond, in part in an effort to make the concept of open source software less threatening to the commercial marketplace. The current, lengthy list of licenses (many rarely used) that have been submitted and approved by OSI may be found [here](http://opensource.org/licenses/alphabetical): <http://opensource.org/licenses/alphabetical>

<sup>9</sup> Sun open sourced the SPARC architecture in March of 2006. Interested engineers can participate in the further evolution of the architecture through the [OpenSPARC Initiative](http://www.opensparc.net/), which maintains a Web site here: <http://www.opensparc.net/> [Power.org](http://www.power.org/) was established by IBM and supporting companies in 2004 to develop open standards, guidelines, best practices and certifications to support IBM’s Power Architecture. Its Web site is here: <http://www.power.org/home>

<sup>10</sup> [OpenMoko](http://www.openmoko.com/) was announced by First International Computer (FIC) in 2006. Its Web site can be found at: <http://www.openmoko.com/>

benefit of all, and most particularly of the platform vendor itself. As a result, even traditionally closed and controlling vendors, such as telecommunications companies, are now competing to open up their (often Linux-based) mobile telephone operating systems in order to encourage ISVs to make the use of mobile phones more interesting and attractive. Already, several major vendor as well as community efforts have been launched, each with a different approach, and with a different member composition:<sup>11</sup>

- **LiMo (for Linux Mobile) Foundation**, formed in January 2007 primarily by handset vendors. LiMo was founded to “create an open, Linux-based software platform for use by the whole global industry to produce mobile devices...enabling a rich ecosystem of differentiated products, applications, and services from device manufacturers, operators, ISVs and integrators.”<sup>12</sup>
- **Open Handset Alliance**,<sup>13</sup> announced on November 5, 2007. OHA is spearheaded by Google, and was supported by 33 additional members at launch, including mobile handset makers, application developers, some mobile carriers and chip makers. Like LiMo, OHA is developing a Linux-based open mobile platform, in this case called Android.
- **Moblin.org**,<sup>14</sup> the Mobile and Internet Linux project, launched by Intel in July of 2007 as an open source project. Moblin is focused more broadly than LiMo and OHA, focusing on “mobile Internet devices,” a more heterogeneous category than simply handsets. Canonical, the developer of the Ubuntu Linux distribution, is working on an operating system in support of the project.
- **GNOME Mobile & Embedded Initiative**,<sup>15</sup> announced in April of 2007, and focused on the GNOME Linux-based operating system

**Open standards:** The definition of open standards is at once the oldest as well as the (currently) most disputed. In traditional standard setting circles, “openness” was achieved through a rule set that sought to ensure that all “stakeholders” (i.e., not only those that implement standards, but also governments and those affected by standards as well) had access to the process, that consensus would drive decisions, that an appeals process would be provided, and that the IPR of a single stakeholder would not unreasonably stand in the way of the common good whenever that result could be achieved.

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<sup>11</sup> On March 6, 2008, Apple’s Steve Jobs announced his own, more limited and controlled effort at attracting ISVs to the iPhone platform. Under the Apple plan, ISVs can gain access to the necessary technical information to create applications to run on the iPhone, which Apple will then market through a new “App Store” that it will host. I have doubts whether this more controlling effort will be as successful as the other, more open mobile efforts, as I discussed in a March 7, 2008 blog entry at The Standards Blog titled [Steve Jobs Endangered Second Act](#), at <http://www.consortiuminfo.org/standardsblog/article.php?story=20080307054430261&>

<sup>12</sup> “Welcome to LiMo,” at: <http://www.limofoundation.org/welcome-to-limo.html> accessed May 28, 2008.

<sup>13</sup> The home page for the [Open Handset Alliance](#) can be found here: <http://www.openhandsetalliance.com/>

<sup>14</sup> The [Moblin.org Web](#) site can be found at: <http://www.moblin.org/>

<sup>15</sup> The [Gnome Mobile](#) Web site can be found at: <http://www.gnome.org/mobile/>

With the rise of the information and communications technology, however, this rule set began to become more constraining, for a variety of reasons, and particularly so in the case of software. Those reasons include the proliferation of patent “thickets,” the convergence of technologies in single devices (such that a mobile telephone, for example, may infringe upon hundreds of patents as a result of complying with necessary standards), and the increasing deployment of open source software under licenses with terms that may not be satisfied when standards are implemented that were developed under traditional IPR policies.

The result has been an ongoing debate over the definition of what should constitute an “open standard,” and particularly over what the IPR terms of the policies should be under which such standards are developed.<sup>16</sup>

**Open content:** The concept of open content is in many ways similar to open source and free software, but made generic to serve any type of copyrightable work, whether it be text, graphic, audio or video. As with software, a set of legal terms serving this concept has been proposed and become widely adopted as a result of the efforts of articulate visionaries that have (once again) created a non-profit entity to serve that vision. The most prominent advocate in this case is Stanford Law School professor [Lawrence Lessig](#), and the resulting institution is called the Creative Commons.<sup>17</sup>

The goal of the Creative Commons is to encourage wider reuse of copyrightable works by providing easy to use, free legal tools that creators can use to provide such rights, for such purposes, and to such types of users, as they wish. This is accomplished through a series of plain language licenses (now translated into 43 languages) that make it easy for creators to make their work as freely and easily available as they wish. As explained at the Creative Commons Web site:

In the words of Thomas Jefferson, “He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening me.” An idea is not diminished when more people use it. Creative Commons aspires to cultivate a commons in which people can feel free to reuse not only ideas, but also words, images, and music without asking permission — because permission has already been granted to everyone.<sup>18</sup>

We use private rights to create public goods: creative works set free for certain uses. Like the free software and open-source movements, our ends are cooperative and community-minded, but our means are voluntary and libertarian. We work to offer creators a best-of-both-worlds way to protect their works while encouraging certain uses of them — to declare “some rights reserved.”<sup>19</sup>

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<sup>16</sup> One of the most cited discussions of open standards attributes is [Open Standards Requirements](#), by Ken Krechmer, at <http://www.csrstds.com/openstds.pdf> *The International Journal of IT Standards and Standardization Research*, Vol. 4 No. 1, January - June 2006. Krechmer’s lists of attributes is sufficiently comprehensive, however, that very few standards organizations would likely to satisfy it.

<sup>17</sup> The [Creative Commons](#) Web site can be found at: <http://creativecommons.org/>

<sup>18</sup> Excerpted from “[Legal Concepts](#),” Creative Commons, accessed May 18, 2008, at [http://wiki.creativecommons.org/Legal\\_Concepts](http://wiki.creativecommons.org/Legal_Concepts)

<sup>19</sup> Excerpted from “[About](#),” Creative Commons, accessed May 18, 2008, at [http://wiki.creativecommons.org/Legal\\_Concepts](http://wiki.creativecommons.org/Legal_Concepts)

The licenses themselves are visually coded to symbolically indicate the significant terms that each contains, making it easy for anyone to select the licensing approach most to their liking. The terms and their associated symbols are as follows:



**Attribution.** You let others copy, distribute, display, and perform your copyrighted work — and derivative works based upon it — but only if they give credit the way you request.



**Noncommercial.** You let others copy, distribute, display, and perform your work — and derivative works based upon it — but for noncommercial purposes only.



**No Derivative Works.** You let others copy, distribute, display, and perform only verbatim copies of your work, not derivative works based upon it.



**Share Alike.** You allow others to distribute derivative works only under a license identical to the license that governs your work.<sup>20</sup>

Because the Creative Commons has created and maintains the source documentation for the licenses in three forms - plain language, legal “fine print,” and machine-readable code that can be detected by search engines - a creator can place her work under the Creative Commons license of her choice in a matter of minutes.

The licenses provided by the Creative Commons have been very widely adopted, not only with respect to specific works, but also to all of the material at individual blogs, in photo collections at sites such as Flickr, and in many other situations on the Web. As a result, the Creative Commons has helped facilitate not only the reuse of much of the most easily available content, but also the workings of collaborative projects. Other projects, such as the Wikipedia, utilize the GNU Free Documentation License, which was created for a similar purpose.<sup>21</sup>

**Open data:** The concept of open data is intended to encourage and enable broad availability of non-textual data of various, usually scientific types (e.g., genomic and mapping data). Due to the high economic value of much data of this type, and the fact that scientific data tends to be created in non-profit institutions and for-profit labs that are in each case subject to ownership policies relating to IPR, the articulation and adoption of open data is thus far less advanced. However, the value of making data rapidly and widely available on the Internet in formats allowing it to be rapidly searched and integrated is obvious.

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<sup>20</sup> Excerpted from “[License Your Work](http://creativecommons.org/licenses/by/2.0/),” Creative Commons, accessed May 18, 2008, at <http://creativecommons.org/about/license/>

<sup>21</sup> The [text of this license](http://www.gnu.org/copyleft/fdl.html) may be found at the GNU Project Web site at <http://www.gnu.org/copyleft/fdl.html> (accessed May 18, 2008). There are a number of other, less widely used open content licenses.

**Open access:** Open access is a practice that relates to both open data and open content. The term was coined at a meeting held in Budapest in December of 2001 that led to the issuance of a call to action referred to as the Budapest Open Access Initiative.<sup>22</sup> Those that drafted the Initiative document recognized that there was great opportunity to be gained by returning to the historical practice of freely sharing scientific data and learning, so that the academic and scientific communities at large could benefit from, and build upon those contributions. In order to achieve those goals, the Initiative recommended both self publishing by researchers and authors (which it called Self-Archiving)<sup>23</sup> as well as the conversion of journals to on-line, searchable resources (which it referred to as Open Access Journals).

This call to action was met with enthusiasm. As of this writing, the Directory of Open Access Journals lists 1151 journals searchable at the article level, exposing a total of 184,817 articles in all to search engines and direct searches.<sup>24</sup>

### III Lessons Learned and Next Steps

As can be appreciated from the high level overview of open methodologies offered above, the very brief existence of the Internet and the Web has led to broad appreciation of the benefits that can arise from greater visibility and collaboration. The examples given also demonstrate a great deal of creativity in using traditional legal tools in an effort to facilitate and encourage such activity. In each case, these tools have been created to address a desire to rebalance the traditional rights of creators and inventors with those that wish to build upon their efforts.

It is important to note that while this willingness to share is to some extent based upon moral or ethical grounds, it is also firmly rooted in self interest. In every case noted above, those that are willing to give more also anticipate getting more, with this new potential made possible by the global reach of the Internet and the searchable nature of the Web. In consequence, it would appear that the trend towards openness is likely to be fundamental and sustaining, rather than a passing fad.

It is important to recognize the magnitude of this revolution, because it indicates that another fundamental shift – this time in law, or at least in legal tools – is both warranted as well as desirable, in order to capitalize on the benefits that increased sharing can offer. To date, these benefits have sometimes been trivialized, with proponents of legal change pointing only to (for example) pop cultural “mashups” of audio and video clips on YouTube. While such activities are certainly not trivial to those involved in the arts, they do not represent the examples most likely to head off the legions of lobbyists that could be expected to descend upon legislators if changes were feared that would apply equally to semiconductor chip designs, the text of best selling novels and the formulations of blockbuster pharmaceuticals.

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<sup>22</sup> The [text of the Initiative](http://www.soros.org/openaccess/read.shtml) can be found at <http://www.soros.org/openaccess/read.shtml> (accessed May 18, 2008).

<sup>23</sup> Self-Archiving has been facilitated by the formation of the [Open Archives Initiative](http://www.openarchives.org/), which develops standard for that purpose. The home page of this organization can be found at: <http://www.openarchives.org/> (accessed May 18, 2008).

<sup>24</sup> The [index](http://www.doaj.org/) of the Directory of Open Access Journals can be found at <http://www.doaj.org/> (accessed May 18, 2008).

**What can be gained:** Changes of any nature to existing laws will require strong justifications. It is therefore useful to summarize some of the ways that a liberalization of laws and practices can benefit society, as well as provide off-setting benefits to IPR owners as well. Consider, for example, the benefits that can accrue from the following:

- **More rapid development of projects of all types**, due to the ability of more like-minded individuals to join in collaborative communities than before, and from greater freedom to reuse and incorporate the work of others
- **More rapid scientific discoveries**, because information can be accessed and searched immediately upon disclosure on line, and then used as the basis for further discoveries
- **Greater opportunities for those in emerging societies**, as a result of a more level playing in research and development, through free and unrestricted access to more data, software and open content
- **Greater ease of entry for new businesses in developed societies**, resulting from lower barriers to entry through use of open technologies, data, content and other material
- **Reduced prices and greater profits**, as a result of widely shared development costs

Many of these benefits are already being realized. But some impediments remain, chiefly in the area of patents, but also under copyright law.

**What may need to change:** As already demonstrated by the development and widespread use of FOSS, open source and Creative Commons licenses, a great deal of creativity has already been invested in adapting old tools to serve new uses. But there are limits to how far this process can be taken. The following are examples of areas in which legislative action, organic evolution through the courts, or additional non-profit organizations might be useful:

**Fair use:** Traditional fair use doctrines have permitted only extremely limited reuses of copyright material. Currently, only a few words can be safely reused in most situations, and not a great deal more even where (as in literary reviews) more extensive excerpts can be incorporated. At the same time, the degree of tolerance for reuse in the breach is changing, in some cases dramatically, as content owners often reap indirect financial rewards as a result of such borrowing. Examples of such practices include news links at blogs that include news article outtakes that often exceed fair use length, but then provide a link back to the content owner's site, thereby driving traffic and enhancing revenues. In some cases, such reuse is even desired and encouraged as part of modern marketing campaigns.

**Software patents:** The current state of U.S. patent law as it relates to software seems to please just about no one, although there is a wide variety of

opinion on how the law and the operations of the United States Patent and Trademark Office (PTO) should change. Leaving aside calls to abolish patent protection for software entirely, there is consensus that patents are too easy to get, and too hard and expensive to challenge when they have been improperly granted. Any progress in cutting down on the density of so-called "patent thickets" would provide at least some incremental relief.

***Increased use of non-assertion covenants:*** A commitment made by a patent owner that it would not assert its "essential claims" against compliant implementations of a given standard has been a permissible alternative to agreeing to providing an implementation licenses on RAND terms in some standards organizations for many years. More recently, such pledges have been made in connection with FOSS and open source software as well. In principle, such promises are much better than a commitment to license, since no action on the part of the beneficiary of the pledge is required at all, and because it is apparent to all that everyone benefits to exactly the same degree (as compared to the licensing situation, where specific terms are usually known only to the parties on a license by license basis).

But pledges, like license commitments, do have some limitations, such as variations in terms, and difficulty of enforcement against later owners of the patents in question. These weaknesses could be solved, in the first instance, by an organization that maintained a list of pledges that had been found to meet minimum standards for FOSS licensing, and in the second instance, by setting up a registry with the PTO that would allow a patent to be permanently encumbered with the obligation assumed, much as a mortgage filed with a registry of deeds enables an enforceable obligation to be imposed on a successor owner of real property.

#### **IV Summary**

During the years of the Internet Bubble, it was fashionable to observe that the Internet had "changed everything." That observation seemed naïve and without basis by 2001. But with time it has become apparent that the Internet really has changed some things in a fundamental and permanent way. One of those things is the way in which knowledge can be created and shared.

There is ample evidence that this more limited observation is sound, and that much can be gained by taking appropriate action to encourage and facilitate the ways in which the Internet can be utilized for the purpose of sharing information as widely and quickly as possible, and collaboratively building upon that information in as unrestricted a fashion as possible.

This process is already well along, through the organic efforts of a wide variety of both visionaries as well as lesser mortals, who together are creating and promoting new tools that have already enjoyed wide and successful adoption. This grass roots process will no doubt continue, and may in fact be best suited to realizing the potential of a wired world for some time to come. While this experimental process continues, restraint on the part of legislatures, and a willingness to be open minded on the part of the courts, may provide the best route to eventually settling on a

new balance between the IPR rights of creators and inventors, on the one hand, and re-users and end-users on the other.

When that process is complete, the more traditional process of law making and treaty drafting can step in to memorialize and formalize the solutions worked out in the trenches, based on the wisdom gained through the rough and tumble of the marketplace.

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## STANDARDS BLOG:

# Introducing the Hague Declaration

Andrew Updegrove

**Date:** May 13, 2008

**Views:** 2,048

When one thinks of international human rights, one thinks of The Hague - home of the International Court of Justice and the International Criminal Court, and the situs of an increasing number of Tribunals chartered to redress the assaults on human dignity that inexcusably continue to plague this planet. It is therefore appropriate that The



Hague has been chosen to witness yet another announcement in defense of human rights. That pronouncement has been titled [The Hague Declaration](#) by the new international group, called the [Digital Standards Organization](#) ("Digistan," for short), that crafted it. In this blog entry, I'll talk about what the Declaration is all about, and what it is intended to achieve.

The basic premise is that as more and more of our basic freedoms (speech, assembly, interaction with government, and so on) move from the real to the virtual world, care must be taken to ensure that our ability to exercise these freedoms is not inadvertently eroded or lost. On the opportunity side, the Internet and the Web provide incredible and unique ways to bring the benefits heretofore enjoyed only in developed countries to those struggling for equality of opportunity in emerging countries.

But our freedoms can only be preserved, and these benefits can only be extended, to the extent that everyone has affordable, unrestricted access to the Internet. Just as we should be free to choose our newspapers, radio stations and political parties, we should be able to choose how we log on to the Internet, and the tools we use to interact there. For the less advantaged, this should be achievable at the lowest possible cost.

In order to achieve this end at the technical level, we need the type of free and open digital standards that can ensure adoption in many different competing products, prevent vendor capture, and enable implementation in free and open source software as well as proprietary products. If we are successful in creating such standards and achieving their ubiquitous adoption, then we can assure lowest cost solutions and the greatest breadth of choice. And we can also thereby help preserve what I have previously called our "Digital Information and Communication (ICT) Rights." These are issues that I've written on frequently of late, most thoroughly in [this issue](#) of [Standards Today](#).

The Declaration expresses these goals this way:

Considering that all countries are moving, at different rates and from different starting points, towards a society in which full and effective participation in government and society, and access to public services, education and opportunity, are increasingly dependent upon access to electronic communications;

Considering more specifically that:

- Government information, services and resources are increasingly provided virtually rather than physically;
- Freedom of speech and association are increasingly exercised on line rather than in person;
- The Internet and the Web provide an unprecedented avenue to equality of education and opportunity for all peoples throughout the world;

Considering that the benefits of the Internet may only be guaranteed, and our hard-won human rights may only be preserved as we make the transition to a digital society, by ensuring affordable, equal access to the Internet, and if the openness of the Internet is also preserved;

Considering the unique role that free and open digital standards can play in ensuring this result by fostering competition and innovation, lowering costs and increasing choice;

Because governments have the authority to protect human rights and the moral obligation to promote equal economic and educational opportunities, the Declaration also recognizes the need for governments to recognize and support free and open standards. As a result, the Declaration concludes as follows:

We call on all governments to:

1. Procure only information technology that implements free and open standards;
2. Deliver e-government services based exclusively on free and open standards;
3. Use only free and open digital standards in their own activities.

I personally believe that The Hague Declaration is an important statement that articulates essential values and goals in a way that is easily understood. My hope, and that of the other founders of Digistan, is that it will be useful in helping both citizens and legislators understand something that many have already sensed, but might not have been able to find the right words to wrap around their concerns.

It is difficult to advocate for something that is difficult to describe. With this Declaration, I believe that we have found the words we need to recognize and protect something that has been hard won, and is too precious to lose through inadvertence: our basic human rights, as expressed and exercised in the virtual

world.

I'd encourage you to read the full Declaration (the text also appears at the end of this blog entry). If you agree with what you read, please consider [adding your name](#) to the growing list of signatures (the Declaration was posted publicly just a few hours ago at the Digistan site). *[As of May 29, a total 1963 individuals have signed the Declaration]*

The Hague Declaration will be officially issued on May 21 in The Hague at a workshop to be held by Digistan. That meeting (like Digistan) is open to all, and you can read more about it [here](#).

In my next blog entry, I'll tell you about Digistan itself - and how you can become involved.

For further blog entries on Standards and Society, click [here](#)

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\* \* \* \* \*

## **The Hague Declaration**

*Adopted and proclaimed  
by the founders of the Digital Standards Organization  
in The Hague on 21 May 2008.*

Whereas almost 60 years ago the [Universal Declaration of Human Rights](#), established in international law these rights and freedoms:

1. Freedom from discrimination by government or law (Article 2, Article 7).
2. Freedom of movement within the borders of each state (Article 13.1).
3. The right to participate in government (Article 21.1).
4. The right of equal access to public services (Article 21.2).

Whereas these rights and freedoms are today accepted by every democratic government and [backed by the constitutions](#) of most states;

Considering that all countries are moving, at different rates and from different starting points, towards a society in which full and effective participation in government and society, and access to public services, education and opportunity, are increasingly dependent upon access to electronic communications;

Considering more specifically that:

- Government information, services and resources are increasingly provided virtually rather than physically;
- Freedom of speech and association are increasingly exercised on line rather than in person;

- The Internet and the Web provide an unprecedented avenue to equality of education and opportunity for all peoples throughout the world;

Considering that the benefits of the Internet may only be guaranteed, and our hard-won human rights may only be preserved as we make the transition to a digital society, by ensuring affordable, equal access to the Internet, and if the openness of the Internet is also preserved;

Considering the unique role that free and open digital standards can play in ensuring this result by fostering competition and innovation, lowering costs and increasing choice;

Considering that governments, through example and procurement, are uniquely able to ensure that all people achieve the benefits that free and open digital standards can provide;

Considering that these benefits are of particular importance to the economically, socially, and geographically disadvantaged peoples of the world;

Considering that [there is increasing consensus](#) on the attributes of a free and open digital standard;

We call on all governments to:

1. Procure only information technology that implements free and open standards;
2. Deliver e-government services based exclusively on free and open standards;
3. Use only free and open digital standards in their own activities.

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## CONSIDER THIS:

### #54 All Standards are Created Equal (but some are more equal than others)

Andrew Updegrave

Standards are rather authoritarian creatures, gaining their value by bullying their way around the physical or virtual landscape, telling every other part of a design what it has to do, and sometimes even how. Just about everything in the world must kowtow before their insistence, whether it be a wine bottle conforming its shape to match the provenance of its contents, a light bulb limiting its appetite to a specified amount of power, or a WiFi chip petitioning a router for attention.

In a sense, such subservience is counter intuitive. Why would one company want to give up its freedom to design its products as it wishes, and (worse yet) agree to do something the same way as its competitor, thereby decreasing the distinctiveness of its own products? The answer, of course, is that the same company expects to gain more than it gives up when it agrees to cede a few parameters to a standard, while remaining free to differentiate its offerings in all other ways.

The result is an army of fascistic specifications that rules much of just about every discipline, from product design to professional certification to ensuring our safety and health. Most often, the power of these requirements derives simply from market forces, rather than any underlying force of law. We should all be so powerful, but rarely find ourselves so, even in our own homes.

Thus it may come as some small comfort that there are standards, and then there are, well *Standards*. Put another way, there is a pecking order among some types of standards, just as there seems to be in just about everything else in life. The fact is, some standards enjoy more clout than others.

How can that be? After all, if standards have value only to the extent that they are unassailable, how can one be "more assailable" than another?

The answer is actually rather simple. Consider, for example, what the following common objects have in common:

*A 4' X 8' sheet of plywood*

*A cargo container*

*The distance traveled by light in an absolute vacuum  
in  $1/299,792,458$  of a second*

*A 45 RPM single record (assuming you're old enough to  
know what I'm talking about)*

Got it? No? The answer is that each is an example of what I'll call an "Alpha Standard."

What makes a plain, ordinary, garden variety standard an Alpha Standard? In fact, the answer to that question is often "nothing," other than the fact that many standards are derivative, or based upon, other standards to some extent, and you need to start somewhere. Sometimes that "somewhere" has an empirical reason for being what it is or has historical antecedents that lend logic to the selection. But in others, the choice can simply suit the whim of the person (or more likely committee, this being standards we're talking about) making the decision.

Once the decision has been made, however, the standard at the hub of the wheel becomes more powerful with the addition of each new standards spoke. As this occurs, the Alpha Standard becomes more entrenched, and the marketplace becomes increasingly locked in through the adoption of the spider like webs of related standards that grow up around the might Alpha Standard at the center.

Let's take a look at each one of the examples noted to see how this dynamic takes shape:

**Plywood:** Why 4 X 8? For starters, it's a size that's manageable to carry, but large enough to fill up a large space quickly with a minimum number of sheets. It's also about the right size, when placed on edge, to sheathe one story of a building. We'll also pause to note that both its width and length are a multiple of the same number - 2. But let's stop there and just say "why not," and focus instead on the influence that these gross dimensions have on design.

The first thing that we'll notice is that the less unique a building may be, the more likely it will be to have as many of its overall dimensions, as well as internal room sizes, expressed in multiples of 2 feet. If the building in question is a prefabricated house or one of hundreds of "tract houses" built to a limited number of designs in the same development, you'll be surprised how true to form this observation will be. The reason of course is that each is built to the lowest price possible, which means that the designer wants it to be built in the smallest amount of time possible, and with the least wastage of materials.

Obviously, the more you can lay that plywood down and nail it without cutting it off at the edges, the better you'll do on both scores. As a result, simply changing from the traditional practice of using planks to sheath walls and nailing slate to lathe applied to rafters to finish off a roof resulted in housing becoming more uniform in shape and dimensions.

So now we have the dimensions of house, and as many of the rooms as possible, fixed. What next? Well, obviously we'll want all other sheet materials to be the same dimensions, whether we're talking about sheetrock or faux wood paneling for the interior walls, foam panels for the drop ceilings, or flakeboard for the floors. And let's also think about the size of that tile, and the width of that roll of linoleum as well. They all cost money and take time to cut as well. And so it goes, until changing the dimensions of a stock sheet of plywood is about as likely to happen in

our lifetimes as George W. Bush and Donald Rumsfeld are to share the Nobel Peace Prize in theirs.

**Cargo containers:** While the dimensions of a sheet of plywood have helped reshape our houses, cargo containers have literally reshaped the global transportation of goods. In this case, the dimensions of the box approximate the requirements of two pre-existing elements: rail cars and the trailers attached to the cabs of 18 wheel tractor trailer rigs (articulated lorries, to those on the other side of the pond). Once these dimensions had been fixed (at 20 feet in length, 8 in width, and 8 1/2 in height) and "containerization" caught on, every other element of the end to end process of shipping conformed itself to those dimensions – including other standards.

Even standards that had given long and useful lives of service were callously felled by this nouveau Alpha Standard upstart. Let us therefore pause to remember the faithful and timeless ton, now put to pasture in much of global commerce by the TEU, a new kid on the block with an acronymic name deriving from "20 foot [container] Equivalent Unit." And this is just the tip of the iceberg (for the rest of the ice, consult an earlier *Consider This* piece, titled [Thinking About Standards Inside of the Box](#), occasioned by the 50th anniversary of the Birth of the Box).

**Light:** MIT and Stanford graduates will, of course, have immediately recognized this as the internationally recognized method of establishing the basic unit of length in the metric system: the metre (or meter, on *this* side of the pond). But this method is not the original formulation for determining the exact length of this Alpha Standard. That honor belongs to a 90% platinum, 10% iridium bar upon which were etched marks at a distance established at a conference titled, appropriately enough, the Convention du Mètre. A limited number of "prototype metre" bars were later fabricated for distribution to appropriate repositories around the world for reference purposes. These reference bars were etched while stabilized in temperature at "the melting point of ice."

But how was the distance between those two marks determined? To answer this, one must know that it was the French government that first adopted a metric system, and not a Royalist government, but a Republican government, in 1799. The distance selected to serve as the determinant of the metre was therefore intended to approximate, in true rationalist fashion, 1 millionth of the length of an imaginary line drawn between the North Pole and the equator, passing through (of course) Paris. Once that distance had been determined to the greatest precision enabled by the science and mechanical means of the times, the exact length of the meter could be assigned, a new Alpha Standard sprang into being, from which all other decimal extensions, both great and small, could be derived.

Still, even platinum-iridium bars can become tarnished, and they do insist on expanding and contracting. As early as 1893, almost before the new prototype bars had settled in to their new homes, efforts commenced to find some invariable natural phenomenon that could serve as a reference point. Not until 1960, however, was such a natural measure agreed upon, with the laurel wreath being awarded to 1,650,763.73 wavelengths of the orange-red emission line in the electromagnetic spectrum of the krypton-86 atom (yes, of course, in a vacuum!)

Well done! But not, of course, well done enough. Why, after all, settle for less than the ultimate invariable, as discovered by Albert Einstein in his own relativistic way? Why not base the metre *upon the very speed of light itself*? The [Wikipedia entry](#) for the metre provides the last bit of explanatory precision on how this was conceived as follows:

Note that this definition had the effect of fixing the speed of light in a vacuum at precisely 299,792,458 metres per second. Although the metre is now *defined* in terms of time-of-flight, actual laboratory realizations of the metre are still *delineated* by counting the required number of wavelengths of light along the distance. An intended byproduct of the 17<sup>th</sup> CGPM's definition was that it enabled scientists to measure the wavelength of their lasers with one-fifth the uncertainty. To further facilitate reproducibility from lab to lab, the 17<sup>th</sup> CGPM also made the iodine-stabilised helium-neon laser "a recommended radiation" for realising the metre. For purposes of delineating the metre, the BIPM currently considers the HeNe laser wavelength to be as follows:  $\lambda_{\text{HeNe}} = 632.99139822 \text{ nm}$  with an estimated relative standard uncertainty ( $U$ ) of  $2.5 \times 10^{-11}$ .<sup>[3]</sup> This uncertainty is currently the limiting factor in laboratory realisations of the metre as it is several orders of magnitude poorer than that of the second ( $U = 5 \times 10^{-16}$ ).<sup>[4]</sup> Consequently, a practical realisation of the metre is usually delineated (not defined) today in labs as 1,579,800.298728(39) wavelengths of helium-neon laser light in a vacuum.

Pretty impressive stuff, huh? Query, though, whether something may not be missing from this picture of precision, for while the speed of light is absolute, the passage of time is relative. Should our determination of the metre not therefore take place at sea level, given that time passes more slowly at altitude?

Be that as it may, the Mighty Metre, however established, remains the Alpha Standard of length, and the mother of all measurements from here to there, a living legacy of the Age of Reason.

**45s:** Once upon a time, few bedrooms inhabited by teenage girls lacked a cheap portable "record player," next to which would sit a stack of 7" diameter vinyl "records," each in a paper sleeve, and upon which two songs had been recorded, one on the "A" side and one on the other, or (yes, that's right) "B" side (these were not very imaginative times). These records were also referred to as "singles," to distinguish them from the larger vinyl records, called "albums," "LPs" (for "long play," comparatively speaking), and sometimes "33s" (because they spun at 33 1/3 revolutions per minute on the "turntable" found within the "record player" (45's spun at a faster speed - 45 RPMs, and hence the name). Are those of you under 45 (that's age, now) still with me?

Singles could be about three minutes long, because that's about what a 45 could hold under then-available technology. Each 45 (on its A side) held a song that a band or performer hoped DJs would play on the radio, thereby creating demand primarily for the more profitable albums. Albums played for about 45 minutes to an

hour, and were made up of singles, B side tracks, and previously unreleased material.

With that as background for those not alive during prehistory, we can now get back into the Alpha Standard business.

The first and foremost impact of the 45 RPM vinyl format was the enshrinement of the Three Minute Single Standard, the moral authority of which might best be illustrated by paraphrasing the introduction to the Killer Rabbit vignette in Spamalot:

**Station Owner** (Examining the first new 45 single, turning it over in his hands.) Why is it....Why is it this size?

**DJ:** I know not, boss.

**Station Owner:** Consult the book of Payola!  
(Record Agent steps in)

**DJ:** Payola Chapter One, verses nine through twenty-seven:

**Record Agent:** And Saint Phillip Spector raised the 45 up on high saying, "Oh RCA, Bless us this Single, and with its Wall of Sound smash my competitors in MoTown to tiny bits."

And the Chairman of RCA did grin, and the people did feast upon the lambs, and stoats, and orangutans, and breakfast cereals, and lima bean-

**DJ:** Skip a bit, brother.

**Record Agent:** And then did David Sarnoff spake, saying: "First, shalt thou place a plastic spider on thy 33 spindle.

Then shalt thou place upon it and record a single, which shall be three minutes in length. No more, no less.

\*Three\* shall be the length of the single, and the length of the single shall be three.

\*Four\* shalt thou not record, and neither record thou two, excepting that thou then goest on to three.

Five is RIGHT OUT.

Once the number three, being the third number, be reached, then lobbest thou the single at the record stations of the land, who, being in my pay, shall play it. Amen.

**All:** Amen.

**DJ:** Right! (finally gets to put single on turntable)

All right, maybe that's a bit over the top. But suffice it to say that for years, singles were required to be within seconds of three minutes in length in order to make it on the air. For years, the reality of popular music, whether A side, B side, or other, conformed to this norm until the musicians of the late 'Sixties began to rebel against the three minute single standard (just as they, and their listeners, did everything else), at least on albums. The final act of rebellion was committed by the Beatles, who finally broke the three-minute standard rule decisively with the release of their hit "Hey Jude" in August of 1968. As if to rub it in, a good portion of the over 7 minutes of air play is a repetition of that most timeless of all derisive sentiments, "Na, na na, na-na-na-na."

All of which, to be sure, does not in the least disprove the existence of Alpha Standards. Why? Because as everyone knows (or at least those old enough to

remembers 45s), the Beatles in their prime provided the Alpha Standard by which all else was judged.

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