

FEATURE ARTICLE

THE ROLE OF GOVERNMENT IN ICT STANDARDIZATION

Andrew Updegrove

Abstract: *Governments interact with standards in many ways: as developers, when they draft regulations; as adopters, when they reference private sector standards in laws and regulations; as influencers, when they exercise their vast procurement powers in the marketplace, and when they send representatives to participate in private sector standard setting organizations; and as end-users, when they utilize standards-based products. The role that a given government decides to play in relation to standards varies, depending upon the subject matter of the standard, and also among governments, and over time. To date, governments have not as often acted as developers or adopters in the area of information and communications technologies (ICT) as they have in traditional areas of interest, such as public health and safety. However, with the redeployment of a vast range of essential services (including government services) over the Internet, the digitization of public records, and the increased use of information technology in the work place, it is incumbent upon governments to reevaluate their relationship to ICT standards, and decide what roles they wish to play in ensuring that standards development and uptake best serves the public interest. In this article, I seek to facilitate that process, by reviewing the various roles that government can play, using accessibility standards (broadly construed) as an example.*

Introduction: Over the last hundred years, a fairly predictable allocation of responsibility for standards has emerged among government and industry. Typically, government assumes primary responsibility in areas such as health, public safety and ensuring the equality of access to basic rights and opportunities. When a government acts, it provides laws and regulations defining minimum standards, specifies consequences for failing to meet those standards, and enforces those standards through the courts. The common theme among these standards is that government generally concerns itself with those areas where the potential harm to the citizen from non-compliance can be highest.

Private industry tends to be most active in what might be considered to be elective standards, or specifications that are used where the non-commercial stakes are much lower. For example, the physical dimensions of a light bulb socket in a lamp, and the gauge of the electrical wiring in the wall that supplies the current to that lamp, are all physical standards developed by accredited standards development organizations (SDOs). Most aspects of the light socket standard are intended solely to ensure that a light bulb purchased from one manufacturer can be used in a lamp fabricated by another (an interoperability standard), and vendors comply with the standard not because they must, but because it makes good commercial sense for them to do so. In contrast, the gauge standards for the wiring in a wall have been created (again by SDOs) in order to provide reliable reference points for determining the load that can be placed on that wiring without generating dangerous amounts of heat. In the United States, gauge standards achieve the force of law when they are incorporated by reference into local building codes from coast to coast.

Government and industry thus often work hand in hand, with governments taking advantage of the efforts of SDOs and unaccredited organizations (consortia) to develop useful and appropriate standards, and adopting those standards as the reference points for regulation. As a result, standard setting organizations that are both accredited as well as unaccredited (collectively, "SSOs") fulfill a kind of quasi-public role in supporting government. This occurs not only in areas such as health and safety, where governments adopt the standards that SSOs create, but also in more elective situations, where society

benefits from the development and broad adoption of interoperability and performance standards for use in less critical areas, and government plays no part at all.

But where should the lines be drawn between these three layers of standard setting? How should governments determine when they should preempt the field entirely (e.g., in setting automotive safety standards), where they should adopt industry standards (e.g., by incorporating SSO standards into building codes), and when they should leave everything to the SSOs themselves (as is the case with almost all information technology standards)? And how should governments decide when the boundary lines between those three layers should change, as technology, societal practices, and other variables evolve over time?

Moreover, are there limits that governments should apply to their ability to impose standards? Conversely, are there situations where governments should use standards, not to protect the populace, but to advance social agendas, or to encourage certain types of behavior?

One area where questions such as these are being asked with increasing frequency may be loosely referred to as "accessibility," a domain that involves a broad array of practices that until very recently have always involved face to face communications and paper-based records. Now, these same communications are increasingly being transacted via the Internet, and the resulting records are archived in electronic media. This transformation creates enormous opportunities and efficiencies, but at the same time gives rise to new concerns of significance, and can exacerbate traditional risks and concerns as well.

For example, when a doctor created a typical paper-based record a decade ago, that record existed only in that physician's file cabinets, except to the extent that she sent a photocopy to a known recipient, that in turn maintained physical custody of the record, or destroyed it. Today that same record, which might contain not only highly confidential medical information, but also the name, birth date and social security number of the patient, will likely be created in electronic form on the physician's server (hopefully protected by a robust firewall), and then rapidly propagate to the servers of a hospital, a radiologist, an oncologist, an insurance company – and perhaps others. Moreover, if the patient needs urgent medical attention while on a skiing vacation, a doctor in Vail, Colorado may need immediate, secure access to that same record. Fifty years later, the same data may be wanted for diagnostic purposes by a descendant of the same patient.

In this article, I will review the direct and indirect roles that governments have historically played in relation to standard setting, and how these roles may relate to the differing challenges that ICT presents on an ever-evolving basis today. I will then use the example of accessibility standards to explore what types of roles government might choose to play in connection with ICT, both from the traditional perspective of protecting health and safety, as well as in new or more elective roles related to advancing social agendas. Finally, I will recommend specific actions that government might take to maximize its effectiveness in these roles.

I. Direct Government Involvement

Governments can influence the development and uptake of standards in a variety of ways. The following are the most important modes of engagement that government has traditionally employed.

Procurement: The most obvious ways that governments can influence standard setting are first, through its enormous procurement power, and second, through direct participation in consensus based standards organizations. In the United States until 1995, the former was by far the dominant role at the federal level, with the latter being far less important. Most United States federal government agencies fulfilled many of their purchasing requirements by requiring that bidders build to "government unique" specifications. However, these specifications did not necessarily become adopted outside of the government domain, due to factors such as differing levels of cost consciousness between the public and private sectors, design features that are unique to government needs, and more rigorous performance requirements that were not always of equal appeal in the general marketplace.

Over time, the inefficiencies of government unique specifications-based procurement became obvious, in comparison to buying products in the open market that were based upon consensus standards. In response, Congress decided to both improve its own purchasing practices as well as bolster the private

development of standards through the passage of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), which explicitly promotes voluntary consensus standards for regulation and procurement by the U.S. government.¹

Following the passage of the NTTAA, Federal agencies were required to use non-government unique standards whenever possible, and also to actively participate in the development of those standards. As a result, the long-standing roles of the federal government came to be reversed. Thereafter, its specification drafting influence dramatically diminished, while its level of participation in the consensus standard setting process as dramatically increased. In 1998, the Office of Management and Budget (OMB) updated its already issued Circular A-119 to provide additional guidance to the Federal agencies on implementing the NTTAA.²

Whether or not the overall impact of the federal government increased, decreased or stayed the same as a result of the passage of the NTTAA would be difficult to determine without an empirical study. On the one hand, procurement of products built to government-unique specifications dramatically decreased. On the other hand, government procurement of consensus standards based products increased by a roughly proportionate amount, and its direct participation in SSOs increased by orders of magnitude.³

Despite the fact that the United States federal government now sets standards with far less frequency, its direct participation and buying power can nevertheless have a significant impact on the success or failure of a given standard. For example, when a government agency adopts a new standard, it can convey additional credibility to that specification, resulting in broader and more rapid uptake of the standard than might otherwise occur.⁴

Legislation: The most decisive role that a government can play in the standards space is to intervene by imposing its own standard (i.e., a law or regulation). One would expect that this is most likely result when new technologies replace old ones in areas of traditional government concern. In the case of ICT, this has already occurred as legislatures struggle with issues such as spam, where the analogies to junk mail, junk faxes and telemarketing are obvious and the legislative precedents are comparatively clear. Similarly, responding to identity theft via the Internet can rely to a significant extent on earlier decisions based on the theft of credit card and other data by more traditional means. But setting laws to control behavior (e.g., by setting criminal penalties for phishing) is different than intervening to influence the technical standards that can lower crime by augmenting security (i.e., by making phishing more difficult).

Some areas of actual communications technology (such as radio and televisions frequencies) have been the subject of domestic regulation (in the United States, via the Federal Communications Commission, FCC). Regulation of the multiple new types of wireless standards that are now regularly emerging therefore arises naturally within existing regimes and systems.

International treaties: Most international collaboration on ICT standards occurs through non-governmental entities, such as the Joint Technical Committee 1 (JTC 1) of ISO and the IEC. But there are exceptions, such as the International Telecommunication Union (ITU), a venerable organization with a more than century long history that now operates as a treaty organization under the auspices of the

¹ National Technology Transfer and Advancement Act of 1995, 15 U.S.C. § 3701 (1995).

² OMB, Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities, Circular A-119, Revised (Feb. 10, 1998), *available at* <http://www.whitehouse.gov/OMB/circulars/a119/a119.html>.

³ In assessing the impact of direct participation by government SSOs, it is worth noting that while government participation in consortia and SDOs has increased, government agencies rarely if ever join a consortium at the higher and more influential levels of membership that usually control strategy. Even when government representatives do take board seats, they frequently abstain from voting.

⁴ An excellent current example is provided by the near-contemporaneous announcement by both Wal-Mart and the United States Department of Defense that each would require certain of its suppliers to adopt and deploy RFID technology in their deliveries. For more on the recent evolution of United States government standards policy, see Updegrave, Andrew, [A Work in Progress: Government Support for Standard Setting in the United States: 1980 – 2004](#), ConsortiumInfo.org, Consortium Standards Bulletin, Vol. IV, No. 1, January 2005, at <http://www.consortiuminfo.org/bulletins/jan05.php#feature>, and sources cited therein.

United Nations. Participation in the ITU is by institutional representatives appointed by national governments.

Treaties can also utilize, bolster or regulate activity in relation to consensus-based standards. The most powerful example of this activity is the Agreement on Technical Barriers to Trade (ATBT), enacted under the World Trade Organization in 1995. Under that treaty, governments are prohibited (among other restrictions) from using unreasonable conformance testing or unnecessary national standards as tactics to impede or prevent the import and sale of foreign products.⁵

II. Indirect Government Involvement

Standard setting is time consuming, and requires expert input. Some nations (such as China) pursue a so-called "top down" approach and maintain extensive standard setting infrastructures at the national level. Others, such as the United States, rely heavily on the private sector to do the work of prioritizing projects and designing standards, through a "bottom up" process utilizing SSO to achieve their goals. Among the nations that follow this approach, greater influence is given to commercial players, resulting (proponents of this approach believe) in more timely, responsive and effective standards. An added benefit of this approach is the fact that tax dollars are saved, because the costs of standards production are shifted to industry.⁶

Areas of standards concern: When a government decides that it will not set the standards in certain domains that are nonetheless of significance to policy or traditional governmental roles (I will call them "areas of standards concern"), many questions arise. From a practical perspective, how should government staff and maintain expertise and lines of communication in areas in which it does not have direct involvement? Also, how can government still influence the standards that are set in those sectors? For nations that prefer the top down approach, should exceptions to that approach be made, and if so, how will decisions to do so be made, and by whom?

For example, if the private sector is to predominate in areas that are not sufficiently crucial to warrant regulation, but are nonetheless significant enough to warrant government concern, should government intervene if needed standards do not materialize within a reasonable period of time? If government does intervene, should it do so as a catalyst to nudge the private sector into action, or should it preempt the field entirely, developing the needed standards itself, and then enacting them into law?

Examples of areas of standards concern are not hard to find. Three current standards domains in which government has decided to become more actively involved are first responder standards, data sharing standards, and electronic healthcare standards.

⁵ The text of the ATBT can be found at < http://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm > (accessed March 3, 2007). For more on the WTO's activities to prevent technical barriers to trade, see its [activity page](#) on that topic, and the many links and resources that can be accessed there, at <http://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm> (accessed March 3, 2007).

⁶ Where, of course, they are passed on to consumers and other end-users. The net result is therefore that the costs are not avoided by taxpayers, but simply reallocated through a different formula. The top-down vs. bottom-up debate is long-standing and energetic. For a discussion of the two philosophies, as manifested by the United States and China, see Updegrave, Andrew, [Top Down, or Bottom Up? A Tale of Two Standards Systems](#), ConsortiumInfo.org, Consortium Standards Bulletin, Vol. IV, No. 4, April 2005, at <<http://www.consortiuminfo.org/bulletins/apr05.php#trends>>. A recent example of the approach in action with respect to a single product area is provided by the paths taken to develop and deploy cellular phone technology. In Europe, a "top down" approach led to the early adoption of a single standard that came to be adopted almost everywhere in the world (except in the United States), providing seamless geographic services to those using phones compliant with the resulting GSM standard. In the United States, a market driven approach led to competing standards and near-term incompatibilities between carriers, but also to the eventual adoption of a standard that some believe to be technically superior to the GSM standard. The cellular phone example has been widely examined from this perspective. For an alternative view of the same history – contending that results are more likely to be based upon openness of architecture – see Rice, John and Galvin, Peter, [The Development of Standards in the Mobile Telephone Industry and Their Effect on Regional Industry Growth](#), 2000, at <<http://www-i4.informatik.rwth-aachen.de/%7Ejakobs/siit99/proceedings/Rice.doc>>.

First responder standards: Five and a half years ago, the 9/11 attacks exposed the tragic lack of effective standards to permit first responders to communicate with each other. Multiple efforts were launched within many SSOs to address this gap. The American National Standards Institute (ANSI) created the [Homeland Security Standards Panel](#) in February of 2003 to help coordinate standards activities in this and related areas with the efforts of the newly formed Department of Homeland Security. On May 19, 2004, Secretary of Homeland Security Tom Ridge highlighted the lack of appropriate standards in his [testimony to the 9/11 Commission](#).⁷

But despite these activities, enormous gaps remain in the ability of police, fire and other emergency forces in adjacent communities to communicate effectively when coordination is essential.

Data sharing standards: The failure of the FBI and the CIA to share key data has been identified as one failing that helped to enable the events of 9/11 to occur. In an effort to avoid future lapses in the of integration of intelligence and actions among relevant agencies, a new cabinet-level agency named the Department of Homeland Security was created to oversee, and improve coordination between, agencies able to assist in defending homeland security.

But inter-agency rivalries were not the only cause for poor data sharing. In fact, the federal government maintains information in a very large number of IT "silos" that have been created through non-coordinated IT purchasing. The result is great difficulty in data sharing among, and even within, individual agencies. An example of the challenges that result from the historical creation of such disparate systems can be appreciated from the following elementary, data formatting example:

The task of bridging hundreds of formerly stove-piped systems is enormous. Every system has its own way of formatting data and defining the meaning of database terms. For instance, one system may use the term "FirstName" and another the term "FName" to specify a person's first name in a database. In other cases, different systems may use an identical label to represent different data. "CNum" may mean "case number" in one system and "catalog number" in another.⁸

eHealth standards: The enormous costs of medical care have focused attention on deriving ways to gain efficiencies and cut costs. In December 2003, Congress passed the Medicare Prescription Drug, Improvement, and Modernization Act,⁹ under which the Commission on Systemic Interoperability was created, with the charge of developing a strategy to make healthcare information instantly accessible at all times, by consumers and their healthcare providers.¹⁰ One mechanism adopted to further that goal was the creation in late 2005 of the Healthcare Information Technology Standards Panel (HITSP), which operates under a contract administered by the Office of the National Coordinator for Health Information Technology (ONC). HITSP is administered by ANSI in cooperation with strategic partners including the Healthcare Information and Management Systems Society (HIMSS), the Advanced Technology Institute (ATI) and Booz Allen Hamilton.¹¹

⁷ American National Standards Institute, [9-11 Commission Hearing Calls for Standards in Areas of Emergency Response](#), May 19, 2004, at

<http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=687>.

⁸ Kurlander, Neil. [Out of Step - NIEM and N-DEx: Two national data-sharing initiatives face major challenges](#).

XMLJournal.com, January 25, 2007 at <<http://xml.sys-con.com/read/175403.htm>> (accessed February 27, 2007). Efforts are ongoing to bridge the gaps between these islands of data. Two initiatives discussed in the same article are the National Information Exchange Model (NIEM) and the National Data Exchange (N-DEx).

⁹ [Law No. 108-173, 117 Stat. 2066](#). The full text of the Act can be found at <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_bills&docid=f:h1enr.txt.pdf> (accessed March 3, 2007).

¹⁰ On October 28, 2005, the Commission announced the release of a report, making many standards and certification based recommendations, titled *Ending the Document Game: Connecting and Transforming Your Healthcare Through Information Technology*. These recommendations may be found at <

<http://endingthedocumentgame.gov/report.html>>, and the [complete report](#) at <

<http://endingthedocumentgame.gov/report.html>>

¹¹ On January 23, 2007, U.S. Department of Health and Human Services (HHS) Secretary Michael O. Leavitt announced his acceptance of thirty (30) consensus standards recommended by HITSP. See: [HHS Secretary Leavitt Accepts Recommendations from Healthcare Information Technology Standards Panel \(HITSP\)](#), ANSI.org, January 25, 2007 at

As the examples above demonstrate, government has not hesitated to engage with the standard setting infrastructure through a variety of means when it became convinced that achieving an ICT standards solution was important. Regrettably, the examples given also demonstrate how the progress of such efforts can be slow indeed, as often as not.

III ICT Standards and Social Agendas

Just as governance occurs at multiple levels (local, state, federal, and to a limited but growing extent, internationally), the ability to pursue social agendas arises at the same levels as well. Many of these agendas could, but thus far usually have not, embraced or utilized ICT standards, although the opportunities of doing so are increasing. But as our dependency on the Internet and digitized information continues to increase, it may prove to be difficult or impossible to advance such agendas at all without using standards as tools.

As noted above, governments have begun supporting and influencing the development of ICT standards in new ways. To date, most such action has been oriented towards achieving generic technical, as compared to specific social goals, but the initiatives directed towards eHealth standards noted above are one example of a turn in this direction.

Where standards can be shown to be relevant to achieving identified social goals, how great a departure would it be for governments to employ them to this purpose? After all, from one perspective, there is a great deal of vacant space between attending an arcane technical meeting and (for instance) increasing the value of distance learning for K-12 students. Why should governments consider digging so deep?

In truth, this is not as strange or unusual a concept as it may at first seem. Consider the following examples of government action in one area that is intended to achieve results in another:

- **Tax credits, deductions, and other special provisions:** Federal and state tax codes have been used to influence more types of social goals than could be summarized in a paper many times the length of this article, from the development of alternative energy, to supporting tax exempt entities of all kinds, to promoting home ownership. More locally, municipalities frequently give tax abatements to provide incentives to build job-creating facilities in their areas.
- **Government contracting:** Federal and state regulations have been used to preferentially create opportunities for minority owned, women-owned, and other types of entities.
- **Loan programs:** Federal and state loan, and loan guarantee, programs help provide financing to the same types of businesses, as well as to support small businesses generally.
- **Employment:** Affirmative action hiring policies can be found at many levels of government.
- **Research and development:** Governmental agencies provide billions of dollars of support for basic research in universities and other venues that is not directed at achieving immediate, identified government goals. In contrast, direct economic support by government in the United States for standard setting activities is almost non-existent. Indeed, participation by government representatives in consortia is almost invariably at discounted rates, as compared with the fees required for participation by private industry.

In contrast, direct economic support by government in the United States for standard setting activities is almost non-existent. Indeed, participation by government representatives in consortia is almost invariably at discounted rates, as compared with the fees required for participation by private industry. As a result, government participation in consortia is in fact subsidized by the other members of these SSOs, rather than the reverse.

Given the above examples, why should government not consider utilizing ICT standards to achieve social goals as well, and dedicate an appropriate amount of resources to that result? Assuming that the

<http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=1413&source=whatsnew020507> (accessed February 27, 2007).

questions of "why" and "whether" have been addressed adequately, attention should then logically turn to the questions of "when" and "how."

IV Accessibility standards

One area where government interest in ICT standards would be particularly apt falls under the category of "accessibility," broadly defined. Increasingly, the ability to use all functions of whatever computer system (operating system, browser and applications) an individual citizen may own or have access to in order to utilize the Internet is becoming essential to virtually all aspects of modern life. Not only is this true with respect to managing one's personal affairs, but also to obtain information from, and interact with, government as well. Similarly, gaining access to the job market on an equal basis with others increasingly requires the ability to utilize ICT.

In short, a person is severely impacted in living in a modern first-world country if she does not have access to, and the physical ability to use, ICT of many types. For someone in the third world, the inability to access or use such technology may foreclose the only available hope of benefiting from the broader opportunities of the wider world.

To date, many governments have been largely uninvolved in such questions, even where there are clear analogs to traditional government action. Consider from this perspective the following differential examples between the regulation of ICT practices and other types of conduct:

Access for those with disabilities: In the United States, buildings with public access are subject to federal and state rules intended to ensure that those with disabilities can enter, pass between floors, and use essential services such as rest rooms, all without undue difficulty.¹² In contrast, there has thus far been little legislation or court action directed at ensuring that those with disabilities will not be the subject of discrimination and unequal opportunity when it comes to utilizing ICT to access essential information, services and opportunities. Indeed, governments themselves have sometimes been slow to assign a high priority to accessibility in their procurement of ICT for use by their own employees. The following are examples of recent events that highlight the evolution of thought in this area:

Procurement: In Massachusetts, the most significant argument leveled against adoption of a rule requiring the procurement of products supporting the OpenDocument Format (ODF) was that such products did not provide the same degree of accessibility for those with disabilities as Microsoft Office. This charge was acknowledged by the Information Technology Division (ITD), and a variety of efforts were mounted in cooperation with leaders of the community of the disabled to address the issue. As a result of these actions and the efforts of private sector developers, Massachusetts was able to meet its originally planned conversion date (January 1, 2007) and begin deploying ODF-compliant software, using "plug ins" to permit those with disabilities to continue to use Office until ODF-compliant products had closed the accessibility gap with their Microsoft product complements.¹³

Private Industry: In February of 2006, the National Federation of the Blind brought suit in California against retail giant Target Corporation, charging that Target.com Web pages did not support available accessibility standards. As a result, the blind could not successfully make purchases at the Target Website, because (for example) images could not be identified and described using screen reader software, nor could a purchase be completed without the use of a mouse. The suit was brought under the California Unruh Civil Rights Act, the California Disabled Persons Act and the federal Americans with Disabilities Act, and immediately commanded nationwide attention. Not long after, a Federal District

¹² Building owners are not as a rule required to upgrade their facilities upon the passage of these laws. However, modifying such a "grandfathered" structure subjects the building to the upgrading requirement, and all new buildings subject to these laws are required to be in compliance with accessibility regulations at the time that they open for public use.

¹³ While ODF-compliant products were justifiably criticized by members of the community of the disabled when the ITD announced its initial support of ODF 1.0 in 2005, that situation had changed dramatically by February 2007, due to actions taken by OASIS working groups, the ITD, and the developers of plugin software, as reported in the February 13, 2007 OASIS press release announcing the adoption of ODF version 1.1. See, [OpenDocument Version 1.1 an OASIS Standard](http://xml.coverpages.org/OpenDocumentV11-Announce200702.html), at <<http://xml.coverpages.org/OpenDocumentV11-Announce200702.html>>.

Court judge denied Target's motion to dismiss, holding that such a suit could be properly brought under existing law.¹⁴

The prospect of widespread liability for inaccessibility of Websites may seem novel in the abstract, but in fact the World Wide Web Consortium (W3C) has already created a variety of standards that can be implemented to bring Websites to a greater level of accessibility – either voluntarily, or perhaps with time, as a result of government regulation.¹⁵

Will specific regulations be required to ensure appropriate Web accessibility? Using the United States as an example, the Target case is of special interest, as the plaintiffs brought suit under existing anti-discrimination laws, and the judge in the Federal District Court in which the case is being tried has, as a preliminary finding, concluded that this is appropriate. Accordingly, it may be that existing laws may prove adequate to the task.

On the other hand, reaching ultimate certainty in that regard can take years, if different courts reach different conclusions. If that occurs, it would require action by the Supreme Court to ultimately resolve such inconsistencies – which it could decline to do for some time. Even if the Supreme Court were to intervene, it may choose to limit its holdings to the specific facts and issues presented, which might or might not prove to be dispositive on broader questions.

As a result, action by Congress could serve to shortcut the process by conclusively amending existing laws to provide specific guidance, or by passing new laws extending current protections to relevant ICT-based settings.

Technical Accessibility: Prior to the ICT revolution, government facilities and information were available to all, either by visiting or calling a government office, or by writing to the government and requesting information. In each case, the means to do so (whether they be public transportation, the mails or the telephone) were available to all. But with government enthusiastically embracing the Web, new questions arise, such as what obligation governments should have to make their information and services available to all, regardless of the technical platform and applications that citizens may choose to use?

The most common questions that arise in this area involve browsers and text applications. Government Web sites that provide information that can only be read easily (or at all) in Internet Explorer (and not, for example, Firefox), or opened in Word (and not Apple applications or ODF-compliant software) provoke angry responses from happy users of those products. When the information in question is vital and needed on an urgent basis – as occurred following the Katrina disaster on the Gulf Coast of the United States – this question transcends convenience, and goes to the core of a government's responsibilities to its citizens.

Document Accessibility: The decision of the Massachusetts ITD to adopt ODF (and not the Microsoft OfficeOpen XML format, also known as OOXML) in August of 2005 immediately brought the question of long-term accessibility of documents before the public eye. At the heart of the matter was the responsibility of government to ensure that public records should be available not only in the near term, but over long periods of time, regardless of whether the proprietary products in which they were originally created maintain backwards compatibility, or remain in existence at all.

Following the ITD's decision, a variety of state, local and federal governments around the world took up the issue, and an increasing number of governments and others are either investigating, or have already moved to purchase or require ODF-compliant products.¹⁶ The level of government interest in ODF has

¹⁴ National Federation for the Blind v. Target Corporation, Northern District of California Case No. C 06-01802 MHP. The order can be [found](#) at

< http://www.dralegal.org/downloads/cases/target/062_order_deny_PI_grant_part_MTD.txt>. An overview, the complaint, a press release, and other information can be found at the NFB's Website at [this page](#):

< http://www.dralegal.org/cases/private_business/nfb_v_target.php>.

¹⁵ The [W3C Accessibility Initiative Web page](#) can be found at: < <http://www.w3.org/WAI/>>.

¹⁶ In response to the growing interest in ODF by governments, particularly in Europe, Microsoft announced in the fall of 2005 that it would contribute the OOXML specification to Ecma, a European standards organization. ODF (originally developed by OASIS, a consortium) was preliminarily approved by ISO/IEC in May of 2006, and became

been augmented in part by the formation of an organization called the [ODF Alliance](#), which was formed for the specific purpose of educating policy makers about ODF, and promoting its uptake.¹⁷ The Alliance was announced on March 3, 2006, with 36 founding members. As of the date of this writing, its membership has swelled to several hundred members around the world, including government representatives at all levels, non-profits, open source software organizations, corporations, and others.

International equality of access: The ability to gain access to the Internet and the Web (and with the ever-expanding data density of interactive Web content, broadband access) is becoming increasingly significant on a national as well as an individual basis. In part, such access is a matter of national investment and priority setting, but it is also a matter of international action (or inaction) as well: large sections of Africa, for example, cannot yet gain broadband access, because the international fiberoptic cables needed to provide it have not yet been laid.¹⁸

Accessibility issues are not uniquely the province of national governments, however. Globally, an entirely different set of issues comes into play, some of which are infrastructural, and some of which are uniquely standards-dependent. The following are standards-based examples of ways in which international commercial and government collaboration are needed in order to ensure provision of equal access to all citizens of the world:

Document Name Support: The allocation of domain names and the control of the root directories of the Internet has been a topic of heated discussion almost from the creation of the Internet Corporation for Assigned Names and Numbers (ICANN). While the root directories are insignificant in size, they offer the technical ability to literally turn off a country's access to the Internet. Similarly, ICANN plays a role in deciding how many unique Website addresses are available to any given nation.¹⁹

Character Support: Information that is entered in one character set needs to be convertible into other character sets in order for that data to be exchanged internationally without limitation. At the most basic level, all currently utilized written languages must be supported by the infrastructure of the Internet in order to guarantee equal access to all. This need is particularly acute at present, given that the great majority of data currently on-line has been input in first-world languages, and in particular in English. In order to permit full academic and historical collaboration, the character sets of archaic languages (e.g., Babylonian) must be digitized as well. One of the great unsung teams of heroes of the Internet labors for

an official standard later the same year. Meanwhile, OOXML was approved by Ecma in early December, becoming Ecma-376, and weighing in at over 6,000 pages (in contrast to ODF's c. 800 pages). As this article is being written, Ecma-376 is under consideration by the ISO/IEC JTC 1 under the "Fast Track" process. For much more on the competition between ODF and OOXML, see the September 2005 issue of the Consortium Standards Bulletin, titled [Massachusetts and OpenDocument: The Commonwealth Leads the Way](#) (Updegrove, Andrew, Vol. IV, No. 9), at > <http://www.consortiuminfo.org/bulletins/sep05.php>>, and the many blog entries that can be found in the [OpenDocument file](#) at Updegrove, Andrew, ConsortiumInfo.org, [The Standards Blog](#), September 17, 2005 to date, at < <http://www.consortiuminfo.org/standardsblog/index.php?topic=20051116124417686>>. Links to virtually all primary resources can be found in these blog entries.

¹⁷ The mission of the ODF Alliance is more specifically stated in part as follows: "...To enable the public sector to have greater control over and direct management of their own records, information and documents, the ODF Alliance seeks to promote and advance the use of OpenDocument Format (ODF) as the primary document format for governments. The alliance works globally to educate policymakers, IT administrators and the public on the benefits and opportunities of the OpenDocument Format, to help ensure that government information, records and documents are fully and natively accessible across platforms and applications, even as technologies change." [Mission Statement of the ODF Alliance](#), at < <http://www.odfalliance.org/mission.php>> (accessed March 3, 2007).

¹⁸ Perhaps the starkest current example of disparities in access among countries due to the decisions of local governments can be found by comparing conditions in the two Koreas. While South Korea currently has one of the highest per-capita broadband access rates (ranking number 4 globally, with 26.4% of all inhabitants enjoying broadband access as of June 2006), North Korea has one of the lowest. A list of most-connected countries and related data can be found at Organization for Economic Co-operation and Development (OECD) at [this Web page](#): < http://www.oecd.org/document/9/0,2340,en_2825_495656_37529673_1_1_1_1,00.html>

¹⁹ Address allocation is also a matter of some sensitivity. In the days before address needs began to grow explosively (and before ICANN was created), IBM was assigned 33 million addresses, Stanford was awarded 17 million, and the entire Peoples Republic of China was magnanimously awarded just 9 million. The situation was later rectified by ICANN, but the continuing indirect control of ICANN by the United States through the oversight power reserved to the US Department of Commerce continues to generate concern among some nations, and annoyance among others. For a fuller discussion of the ICANN controversy, see Updegrove, Andrew, [WSIS, ICANN and the Future of the Internet](#), ConsortiumInfo.org, Consortium Standards Bulletin, Vol. IV, No. 11, November, 2005, at < <http://www.consortiuminfo.org/bulletins/nov05.php#feature>>, and sources cited therein.

the relatively unknown Unicode Consortium, which has worked for years to accomplish the Herculean task of digitizing all existing and historical character sets.²⁰

Language support: Like countries (which are identified by three letter codes under a standard maintained by ISO), languages need identifiers as well. And like character sets, codes are needed for lost languages as well as for those that are spoken today. Or, as described by the registrar of ISO 639-3, *Codes for the representation of names of languages*, "ISO 639-3 attempts to provide as complete an enumeration of languages as possible, including living, extinct, ancient, and constructed languages, whether major or minor, written or unwritten."²¹ These codes are used, among other purposes, for specifying languages at Websites, identifying interpreter needs, and for research cross checking. The latest revision of ISO 639-3 (released in February of 2007) increased support from just 478 languages to 7,546 – although this number is still short of the ultimate goal.

V The Future

Representative governments, being the servants rather than the masters of their citizens, tend to be reactive rather than proactive by nature. It is therefore hardly surprising that governments have not yet given great attention to the new realities and challenges of ICT at the level of the standards that in part enable these technologies. But as the importance of ICT increases and public interest groups take ever-greater notice of this reality, governments will need to be increasingly knowledgeable about the role of ICT standards, and the mechanisms by which they are created.

How should government react to this anticipated reality? And should its reaction be different when using standards to advance social policy, as compared to technical, goals?

Areas of standards concern: Using the examples already explored in this article, here are some of the situations that governments will need to consider:

Document formats: There are billions of electronic documents in existence today, some of which are no longer easily accessible due to abandonment of the applications in which they were created. What guarantee will there be that documents created today will be accessible tomorrow, and what role should governments play in achieving that goal? More specifically:

- **Procurement:** The allocation of domain names and the control of the root directories of the Internet has been a topic of heated discussion almost from the creation of the Internet Corporation for Assigned Names and Numbers (ICANN). While the root directories are insignificant in size, they offer the technical ability to literally turn off a country's access to the Internet. Similarly, ICANN plays a role in deciding how many unique Website addresses are available to any given nation.²²
- **Social policy:** Should governments concern themselves only with their own information needs, or should they take an interest in the long-term accessibility of information generally, and therefore seek to influence the behavior of information users generally?

²⁰ The [Unicode Consortium](http://unicode.org/) Website can be found at <http://unicode.org/>. Two appreciation of the Unicode Consortium and its mission that I have written previously are [Savoring the Unicode](http://www.consortiuminfo.org/consider-this), ConsortiumInfo.org, Consider This, October 29, 2003, at < <http://www.consortiuminfo.org/blog/blog.php?ID=4>> and [The Unicode Standard 5.0: An Appreciation](http://www.consortiuminfo.org/standardsblog/article.php?story=20061017163856508), the Standards Blog, October 17, 2006, at < <http://www.consortiuminfo.org/standardsblog/article.php?story=20061017163856508>>.

²¹ [SIL International Website](http://www.sil.org/), at < <http://www.sil.org/iso639-3/default.asp>>, accessed March 4, 2007. For more about ISO 639-03 and SIL International, see Updegrove, Andrew, [Language Codes and a "Philosophy of Three-Part Service."](http://www.consortiuminfo.org/consider-this) ConsortiumInfo.org, Consider This #46< <http://www.consortiuminfo.org/blog/blog.php?ID=46>>.

²² The topic of address allocation has some sensitivity. In the days before address needs began to grow explosively (and before ICANN was created), IBM was assigned 33 million addresses, Stanford was awarded 17 million, and the entire Peoples Republic of China was magnanimously awarded just 9 million. The situation was later rectified by ICANN, but the continuing indirect control of ICANN by the United States through the oversight power reserved to the US Department of Commerce continues to generate concern among some nations, and annoyance among others. For a fuller discussion of the ICANN controversy, see Updegrove, Andrew, [WSIS, ICANN and the Future of the Internet](http://www.consortiuminfo.org/bulletins/nov05.php#feature), ConsortiumInfo.org, Consortium Standards Bulletin, Vol. IV, No. 11, November, 2005, at < <http://www.consortiuminfo.org/bulletins/nov05.php#feature>>, and sources cited therein.

- **Public accessibility:** What document formats should governments make available to its citizens? Does supporting a proprietary format represent an endorsement of that format and its e-vendor-owner? Does the failure by a government to support a format fail that portion of the citizenry that utilizes that format? How can such concerns be balanced with economic and other resource issues?

Accessibility for those with disabilities: Clearly, ICT accessibility is of crucial and increasing importance to full participation in society. But how should governments respond to this emerging reality? Consider the following questions:

- **Analogs:** Are ICT accessibility issues different in meaningful, as compared to simply mechanical, ways from their analogs in the physical world? If they are not, then existing laws may serve to meet the need. If they are in fact different, then amendments to existing laws, and/or new laws, will be needed.
- **Cost/benefit ratios:** Are the costs associated with accommodating the needs of those with disabilities in the virtual, as compared to the physical world, significant (in either direction)? If so, should this indicate the need for any differences in laws or penalties?
- **Coverage:** Should ICT-related standards requirements be more broad or narrow in their coverage than existing laws?
- **Responsibilities:** Who should create the standards upon which ICT-related regulations rely? Should they be regulators, SDOs, or any SSO with domain expertise?

Issues of standards concern: In addressing areas of standards concern, subsidiary issues will also need to be considered, including the following:

Definitions: If governments are to take greater interest in standards, what type of standards should they find to be acceptable? This gives rise to additional questions:

- **"Open standards:"** Current government procurement law in the United States, as codified in OMB Circular A-119, favors the use of widely adopted standards, but does not state a preference between those adopted by stringent consensus processes and those specifications that become *de facto* standards purely as a result of wide usage. Should only standards that meet certain threshold requirements of process, lack of proprietary control, or other criteria be used for certain purposes, and if so, which purposes? If so, what should the requirements be, given that opinions vary widely on what an "open standard" should mean?
- **Uniformity:** If every state and national government were to adopt its own definition of an open standard, it would defeat the purpose of having standards at all, since vendors would simply not bother to meet so many disparate requirements, other than in the non-elective case of procurement – with the result that governments would simply be reverting to the use of "government unique specifications."²³

Standards infrastructure: If governments conclude that ICT standards are of increasing significance to the public interest, how can they ensure that an adequate and timely supply of such

²³ In the case of open document formats, several American states are obviously collaborating on a common definition of an open standard. Bills have been introduced in the current legislative sessions in Minnesota, Texas and California that would require that documents be created and archived only if they are created in applications that support XML-based formats that are:

- (1) Interoperable among diverse internal and external platforms and applications.
- (2) Fully published and available royalty-free.
- (3) Implemented by multiple vendors.
- (4) Controlled by an open industry organization with a well-defined inclusive process for evolution of the standard.

For more on these bills and to find links to their texts, see Updegrove, Andrew, [And California Makes Four](#), ConsortiumInfo.org, The Standards Blog, February 28, 2007, at <
<http://www.consortiuminfo.org/standardsblog/article.php?story=20070228080638136>>.

standards is available, without undertaking to develop such standards themselves? And under what criteria should SSOs be differentiated, if at all?

The traditional standards infrastructure evolved around national standards bodies that created standards that were in turn adopted by quasi-governmental, global standards organizations. However, in information technology, most standards are set by non-accredited rather than accredited organizations, and in communications technology the number is increasing as well.

Historically, many governments around the world have preferred, or required, the use of standards approved by global standards bodies, such as ISO and IEC. Happily, ISO/IEC JTC 1 offers the Publicly Available Standards (PAS) process as an avenue for consortium-based standards to advance to approval as ISO/IEC standards. But given that consortia are usually global in membership to begin with, is there a need for a second layer of global approval that adds time and effort, but may or may not add additional quality control?

Representation: The accredited standards world espouses equality of access to all stakeholders in the standards process. However, that ideal is often hard to achieve in practice, due to the time and resources needed to participate in the standard setting process. Lack of consumer interest can provide a challenge to broad representation of stakeholders as well. If standards are to be used to further social agendas, should some greater level of attention be given to achieving broader participation in SSOs? Or perhaps some other form of safeguard is needed to vet standards at the legislative level?

Certification: If ICT standards become more legally significant, a greater need will arise for effective certification of compliant products. However, as a generalization, compliance with information technology standards is less frequently, and less stringently, tested than compliance with other types of products where (for example) safety is a concern. This is in part due to lack of demand, and in part due to the high costs of creating industrial strength compliance tests relative to the funds that vendors are willing to invest in standards-related collaborative activities.²⁴ If compliance becomes a legal necessity, then testing and certification will become more important. The costs of such added activities will presumably impact product prices.

Funding: Standards development, conformity assessment and participation costs in the United States are currently borne almost entirely by SSO participants and vendors. If governments that endorse the bottom up process want non-profits and the public sector to continue to provide needed standards, then such governments should consider whether some measure of public funding should be supplied to help support this process.

VI Summary and Recommendations

Summary: Ensuring that appropriate ICT standards are available to meet the needs of modern society, and that those standards are in fact adopted, is a legitimate (and perhaps overdue) area of concern for governments to consider. While private industry may in many, or even most, respects voluntarily act to provide the standards needed, it does not necessarily follow that this will occur in all cases, or as quickly as may be needed, or in as effective a fashion as may be needed to achieve appropriate social goals.

ICT "areas of standards concern" are many, including eHealth, homeland security, accessibility, public records, emergency response, and much more. Moreover, standards-related work and regulations that have already been accomplished in the physical world must now be replicated in the virtual world. This task needs to be informed by, but not limited to, using the existing body of laws, regulations and standards and the decisions underlying them as guidance. Where necessary, amending old regulations, and in some cases, the passage of new laws or the launching of new programs will likely be necessary.

²⁴ For a more detailed explanation of compliance, certification and branding in the ICT industry, see the Certification Testing and Branding section of the ConsortiumInfo.org Essential Guide to Standard Setting Organizations and Standards, at <<http://www.consortiuminfo.org/cb>>.

Recommendations: As a result, federal, state, and local governments should reevaluate what their roles and responsibilities in relation to ICT standardization should be. The following recommendations are intended to assist in embarking upon such a study.

Recognition: Governments should affirmatively recognize the importance of ICT standards in many areas, including ensuring full participation in, and access to government, and achieving equality of opportunity in education and employment.

Public records: Governments should ensure that all public records are created, available, and archived in formats that ensure, to the greatest extent possible, practical long-term preservation and access.

Competence: Legislators, regulators and Congressional and agency staff need to be aware of ICT technologies, realities and needs. Existing government resources may not be adequate to this task. Increased funding for the National Institute of Standards and Technology (NIST), relevant Congressional subcommittees and personnel in some agencies may be needed in order to properly support decision makers and administrators.

Infrastructural support: Virtually no money trickles from the top down to support the bottom up standards development process upon which US society and commerce depends today. A small amount of funding could have very significant impact, if directed at discrete projects, such as funding testbeds upon which standards can be based, the creation of best practices, and other inexpensive projects.

Underwriting certification testing: Conducting certification tests can provide revenues to SSOs, but only after the test suites upon which the tests are based have been funded and created. A modest "evergreen" fund (perhaps \$40 million) could provide low-interest loans to SSOs that could be used to create test suites. The loans could then be repaid, using profits derived from certification testing using the test suites so created.

Standards availability: Consortia charge high membership fees and make their standards available for free, while SDOs charge less to participate, and sell their standards. Where the input of consumers and/or the availability of standards without charge is important to the public interest, government should consider a process whereby an SSO could apply for offsetting funds, in order to allow consumers and others to participate in consortia without charge, and to make SDO standards available without cost.

Open standards definition: A common definition of open standards should be developed that would ideally be used by all governments, both federal and state, for procurement and social agenda purposes. This would enable vendors to efficiently create and support standards processes that meet the common definition. Such a definition should be high-level and not detailed, to avoid gratuitous and harmful restriction on flexibility where flexibility is needed, and should be agnostic as to nature of SSO (i.e., accredited or nonaccredited), so as not to exclude the consortia that set the majority of ICT standards.

The list of recommendations is hardly exhaustive of the actions that governments should consider. But it should be sufficient to facilitate the commencement of a dialogue on that topic. Hopefully, such a discussion among interested parties may be launched in the not too distant future.

Bookmark the Standards Blog at <http://www.consortiuminfo.org/newsblog/>
or set up an RSS feed at: <http://www.consortiuminfo.org/rss/>

Comments? updegrove@consortiuminfo.org

Copyright 2007 Andrew Updegrove
