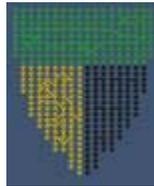


YALE ISP WHITE PAPER

OPEN DOCUMENTS AND DEMOCRACY
A POLITICAL BASIS FOR OPEN DOCUMENT STANDARDS

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I. INTRODUCTION

The modern information society depends upon an enormous variety of electronic devices in order to function on a day-to-day basis. Information and communication technology (ICT) devices are able to exchange information only if they adhere to common communication protocols, technical interfaces, and information formats. ICT “standards” are the blueprints enabling users to access, create, and exchange information regardless of their hardware or software choices.² Increasingly, governments are establishing policies to use ICT products based on standards that adhere to principles of openness and interoperability. For example, Japan instituted a policy that government agencies and ministries should procure software products that support internationally accepted “open standards.” The Brazilian federal government issued an interoperability architecture establishing the adoption of open standards, such as Open Document Format (ODF), for technology used within the executive branch of the federal government. Similarly, Belgium’s federal Council of Ministers approved a proposal to adopt open document standards for creating and exchanging office documents such as text files, spreadsheets, and presentations.

Academic analyses of open standards policies usually address economic and technical concerns. For example, in “An Economic Basis for Open Standards,” economist Rishab Ghosh suggests that open standards can be defined so as to promote full competition, and therefore innovation, among vendors developing products based on these open specifications.³ Because of this desirable economic effect, Ghosh suggests that public procurement policies should promote open standards. But technological design is also political. Technologies both embody values and, once developed, have political consequences. Rationales for government procurement policies based on principles of openness and interoperability should not be viewed exclusively through an economic or a technical lens, but through the prism of the principles that provide democratic governments with their legitimacy.

This paper employs democratic theory as a method of political and ethical inquiry into the implications of openness in information and communication standards. Our account describes four ways in which standards can have political implications:

1. Standards can have implications for other democratic processes;
2. Standards can affect the broader social conditions relevant to democracy;
3. The content and material implications of standards can themselves constitute substantive political issues; and
4. The internal processes of standards-setting can be viewed politically.

After providing examples of each of these political implications, we examine various conceptions of openness in standards and describe maximal and minimal definitions of openness as conceptual poles that anchor each end of the spectrum of potential standards

² See Bob Sutor’s definition of a standard as a blueprint in *Open Standards v. Open Source: How to Think about Software, Standards, and Service Oriented Architecture at the Beginning of the 21st Century*, (2006) Accessed at <http://www.sutor.com/newsite/essays/e-OsVsOss.php>.

³ Rishab Ghosh, *An Economic Basis for Open Standards*, (December, 2005). Accessed at <http://flosspols.org/deliverables/FLOSSPOLSD04-openstandards-v6.pdf>.

policy options. We then develop some guidelines as to the specific contexts in which democratic values require a greater degree of openness in both the substance of technical standards and their development, and consider these imperatives in the political context of electronic public documents. Finally, we describe some selected cases of government ICT procurement policies based on standards that adhere to principles of openness. Our overarching conclusion, emanating from both the theoretical and descriptive portions of this study, suggests that movements toward open standards, particularly in the context of electronic public documents, are highly beneficial for citizens who value democratic principles.

II. STANDARDS AND POLITICAL VALUES

Economic analysis is, in one sense, less complicated than political analysis, because economic examination can eschew constitutive questions about values. Economic analysis typically assumes that whatever people value, they will act rationally in pursuit of resources that will provide greater opportunities for furthering their aims. In contrast, politics often involves struggles over the nature and priority of these values. As groups adhering to different political ideologies are likely to disagree over whether any given value is universally important, some actors who view their roles as bearing some kind of duty of neutrality—and even some actors whose roles are explicitly partisan—are apprehensive about policy justifications that employ the language of values. We argue that all decisions of political significance assert some set of values, whether they are explicitly recognized or implicitly assumed. However, we hope to articulate principles of technical standards design that are general rather than partisan by grounding them in basic democratic values that we think are presumed by all major groups who accept the overall legitimacy of contemporary democratic government.

Whereas economists such as Rishab Ghosh provide a definition of standards appropriate for economic analysis, stipulating that a standard is an agreed upon or chosen technology whose use carries significant externalities,⁴ intellectual property scholar Mark Lemley more generally defines a standard as “any set of technical specifications that either provides or is intended to provide a common design for a product or process.”⁵ This paper adopts Lemley’s broader definition because Ghosh’s formulation potentially constrains the focus on “externalities.” Yet both Lemley’s and Ghosh’s definitions are general in the sense that neither stipulates the *mechanism* by which agreement on the use of the standardized technology arises or is enforced. In the real world, standards arise and remain in operation through a variety of mechanisms. A standard can arise from the voluntary coordinated action of a group of private and public actors, the imposition of a government, or the market dominance of a private actor—whether as a result of the exploitation of luck, first-mover advantages, a natural monopoly, or the less salutary exercise of market power. Similarly, standards stay in operation for a variety of reasons: because of the conservative momentum and incentives created by network effects or path dependencies, the will of a monopolist or cartel, or government enforcement. As our paper is concerned with the political and ethical implications of standards, the identity of

⁴ See Ghosh, *supra* note 2, at 4–5.

⁵ Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations* BOALT WORKING PAPERS IN PUBLIC LAW, Paper 24, 7-8 (2002).

the actors who design and control standards and the means they employ are highly relevant to our analysis.

A. DEMOCRATIC PRINCIPLES IN THEORY

Democratic theorists have managed to articulate plausible democratic principles in very broad and abstract terms, despite disagreeing significantly on their normative justifications and institutional implications. Very broadly, democratic theorists agree that democratic procedures must meet baseline standards of equal opportunity for participation by all members of a polity relevant to a decision or decision-making institution.⁶ Of course, things become more complex and a variety of questions arise when we attempt to unpack this principle.⁷ What procedures constitute adequate participation in a given decisional context? When must a decision-making institution be directly responsive to its polity's participation and input and when may it act in a representative capacity? What is the appropriate decision-rule for resolving persistent disagreement in a given decision context? Who constitutes the relevant polity for any given decision? Should certain stakeholders be privileged in decision-making? What are the duties of public authorities with regard to equalizing the resources and capacities of different parties to participate in decision-making? To what contexts do democratic procedures and values extend? Are democratic principles of equal participation and self-government primarily applicable to formal and planned forums, or are they better conceived as norms guiding informal public interactions or even the overall cultural horizon?

Rather than privileging any particular theory of democracy, this paper draws on the questions these theories raise with regard to particular standards contexts in order to identify the key democratic issues at stake. As such, this paper employs democratic theory as a method of political and ethical inquiry rather than a body of fixed normative conclusions. After we identify these democratic concerns, we can employ them to consider democracy-promoting principles of standards design.

B. THE DEMOCRATIC IMPLICATIONS OF STANDARDS

The questions the previous section listed as arising from the core principle of democratic theory suggest that democratic theory is primarily concerned with certain procedural values in decision-making. This accords with the popular identification of democracy with voting and majority rule: democracy is fundamentally a means for peacefully resolving disputes. However, democratic values are never simply procedural.⁸ The functional constraints on action, the characteristics and relationships between stakeholders, and the substantive values at stake in any decision-making context all

⁶ See Robert A. Dahl, *DEMOCRACY AND ITS CRITICS*, 106–15 (1989).

⁷ See, e.g., *id.*; Robert E. Goodin, *Enfranchising All Affected Interests and Its Alternatives*, 35 *PHIL. & PUB. AFFS.* 40, 40 (2007).

⁸ See, e.g., Jürgen Habermas, *BETWEEN FACTS AND NORMS: CONTRIBUTIONS TO A DISCOURSE THEORY OF LAW AND DEMOCRACY* 302–28 (William Rehg trans., 1996) (1992); Dahl, *supra* note 3, at 163–75; John Dewey, *THE PUBLIC AND ITS PROBLEMS* 207 (1927) (“Majority rule, just as majority rule, is as foolish as its critics charge it with being. But it never is *merely* majority rule”).

necessarily affect our judgment as to the appropriateness of different kinds of procedure.⁹ Furthermore, particularly in the context of large and diverse contemporary nation-states, the implementation of democratic values requires attention to the general social conditions necessary for the functioning democratic processes and institutions.

Different types of standards and standards contexts will raise different kinds of democratic concerns. In the remainder of this section, we begin our examination of standards design from the perspective of democratic values by considering four broad ways in which standards can raise political implications in democratic society. This section provides examples of these political implications in order to provide a concrete basis for formulating a democratic orientation to standards design.

Effects of Standards on Formal Democratic Processes

Technical standards have clear political implications when they are involved in the functioning of technology related to formal processes of political authorization and representation, such as periodic elections. Transparency in these formal democratic processes is crucial to maintaining an overall sense of legitimacy and civic trust in government. Electronic voting supplies a prominent example. Vote tabulation processes in elections have historically been available for public scrutiny, with volunteers gathering in a room scrutinizing election ballots. Therefore, the question of whether standards for electronic voting tabulations and information exchange are open for viewing, as well as in a format that can be readily inspected, raises political concerns.¹⁰

Impact of Standards on Conditions Relevant to Democracy

Standards are also strongly relevant to democracy to the extent they affect the conditions under which citizens engage in the democratic process. For example, Robert Dahl's influential account of fundamental democratic criteria includes not only the formal equal right to vote, but universally inclusive, adequate, and equal opportunities to participate and to understand the issues and choices under consideration. Standards that affect these conditions are particularly evident in the information technology context, which involves a host of specifications that potentially affect citizens' access to information concerning issues on, or likely to become part of, the political agenda. Such standards clearly affect democracy if they prevent or raise the cost of access to information that governments are supposed to make publicly available.

The archiving of documents is also a fundamental responsibility of democratic governments, as access to such records is important for holding governments accountable and for deliberation over the effectiveness of government institutions and policies. Standards can raise serious problems of backward incompatibility, non-interoperable proprietary formats, and rapid software and media obsolescence. Any of these could prevent government agencies from guaranteeing that electronically archived public

⁹ Dahl, *supra* note 5, at 176–209; Ian Shapiro, DEMOCRATIC JUSTICE 21–27 (1999).

¹⁰ See, e.g. Rebecca Bolin and Eddan Katz, *Electronic Voting Machines and the Standards-Setting Process*, 8 J. INTERNET L., 3 (2004), accessed at <http://ssrn.com/abstract=945288>. Also see Jason Kitcat, *Government and ICT Standards: An Electronic Voting Case Study*, INFORMATION, COMMUNICATION, AND ETHICS IN SOCIETY (2004), accessed at http://www.j-dom.org/files/Kitcat-evoting_case.pdf.

records will remain accessible in the future. Electronic archives reduce information to bits—structured collections of 0s and 1s. Interpreting what binary streams represent requires understanding the formatting structures in which the bits are arranged, software that can read the structure and access the application in which the information is stored, and hardware that can access the storage medium. Electronic information accessible today may become inaccessible in ten years because previously dominant physical media, software, and other proprietary formats are no longer supported.¹¹

Standards that impede or enable access to information and technology outside of the conventional sphere of government responsibility or control may also have significant consequences for conditions of democracy. In considering democratic principles, it is easy for political scientists and laypersons alike to focus heavily on formal democratic institutions and processes, such as parliaments, state organs, public hearings, and elections. Yet the substance of democracy in the contemporary world extends well beyond such formal sites and events, and encompasses both the informal interactions of civil society¹² and potentially a community's culture as a whole.¹³ Thus, standards that empower or restrict citizens' capacity to interact and inquire within their community's cultural horizon may significantly impact a polity's conditions of democracy broadly conceived.

Standards and Substantive Political Issues

Technical standards can also interact with democratic institutions when they have significant effects on the substantive issues of public interest that form the subject-matter of political debate. As Alan Davidson, John Morris, and Robert Courtney describe in “Strangers in a Strange Land: Public Interest Advocacy and Internet Standards,” technical standards have broad public interest consequences in areas such as property rights, individual privacy, and access to knowledge.¹⁴ Standards can also directly intersect with health care issues, such as the HL7 (Health Level Seven) specifications for electronic healthcare information exchange and management. Such effects are relevant from a democratic perspective because standards can be set by a variety of different agents. This aspect of standards is of limited relevance to the economic perspective, which typically takes little account of power issues or the value of self-governance. However, from the democratic perspective, the question of “who decides?” with regard to matters of broad public interest is the political question *sine qua non*.¹⁵ Individuals or groups who control a technical standard could potentially acquire not only market power, but also the power to make decisions that affect the lives and interests of citizens who are dependent on the technology. Consequently, if a standard poses significant consequences for an issue of

¹¹ See, e.g., Simon Davis, *Digital Preservation Strategy*, National Archives of Australia, Record keeping Issues Forum (Nov. 2002), accessed at http://www.naa.gov.au/recordkeeping/rkpubs/fora/02nov/digital_preservation.pdf.

¹² See, e.g., Jean L. Cohen & Andrew Arato, CIVIL SOCIETY AND POLITICAL THEORY (1994); Iris Marion Young, INCLUSION AND DEMOCRACY 154–195 (2000).

¹³ See, e.g., Jack Balkin, *The Constitution of Status*, 106 YALE L.J. 2313 (1997).

¹⁴ Telecommunications Policy Research Conference, Alexandria, VA (2002). Accessed at <http://www.cdt.org/publications/piais.pdf>.

¹⁵ See, e.g., Dahl, *supra* note 5, at 13–105, 112–14.

public interest, the question of whether the standard is established by a democratically responsive government, a private actor, a voluntary association, or impersonal market forces raises issues of accountability, fair treatment, and stakeholder input.

Advanced industrialized societies are accustomed to the idea that their social systems are organized using a mix of different organizational forms, with the various actors and institutions mentioned above playing different roles in various spheres of action. The desirability of government involvement in a particular sphere depends on numerous context-specific considerations, including estimates of comparative efficiency (both in terms of allocating and using productive resources and accounting for externalities), the relevance of accountability and public input, and the place of that sphere in the polity's collective self-understanding. Society often assigns a robust role to government in either regulating or carrying out a social function for a variety of reasons besides comparative efficiency: a society may view government involvement in a social function because of a sense that the state or the community as a whole has an affirmative obligation to fulfill the function; because it wants to ensure that the entire community has a fair opportunity for input into how the function is carried out; or because it believes it would be morally problematic to give particular actors unfettered discretion over how the function is fulfilled. Serious democratic questions therefore arise when non-state actors' control over a standard results in the displacement of governmental control over a social function that society views as primarily a responsibility of the state.¹⁶

Disaster response is an example of a function that we view as a paradigmatic government responsibility. Incompatible ICT standards that encumber such government services raise questions of particular political concern. For example, incompatible wireless standards for first responders impeded communications during September 11, 2001 rescue efforts in New York City.¹⁷ Browser incompatibility prevented some Hurricane Katrina victims in the United States from registering for FEMA aid online—only victims using Microsoft's Internet Explorer could initially access FEMA's online registration. This incident followed reports of various Thai agencies who, during the rescue and victim identification efforts after the 2004 Southeast Asian tsunami, were unable to exchange documents because of incompatible proprietary document formats.¹⁸

National security is another sphere in which contemporary societies ascribe particular—and usually exclusive—responsibility to the government. This is also a sphere, however, in which information technology plays a significant and increasing role. Besides those national security technologies whose development the government directly commissions to exclusive contractors, encryption, domain name system (DNS), and also addressing protocols sometimes have national security and critical infrastructure protection implications. These include information infrastructures, water control systems, electrical grids, financial markets, and air traffic control systems. Government functions,

¹⁶ See Dahl, *supra* note 36, at 114; Iris Marion Young, *State, Society, and Social Justice*, in DEMOCRACY'S VALUE 141, 156–60 (Ian Shapiro & Casiano Hacker-Cordón eds., 1999), citing Robert Goodin, *The State as a Moral Agent*, in *Utilitarianism as a Public Philosophy* 28 (1995).

¹⁷ See United States General Accounting Office (GAO) testimony of William O. Jenkins, Jr., Director, Homeland Security and Justice Issues before the subcommittees of the Government Reform Committee, House of Representatives, *Homeland Security: Challenges in Achieving Interoperable Communications for First Responders*, GAO-04-2315 (Nov. 6, 2004).

¹⁸ See Berkman Center for Internet and Society, Open ePolicy Group's *Roadmap for Open ICT Ecosystems* (Sept. 2005). Accessed at <http://cyber.law.harvard.edu/epolicy/roadmap.pdf>.

business transactions, and national economies are increasingly dependent upon the Internet. A terrorist attack on the Internet's DNS, or other essential system, could potentially disrupt some critical information exchange and communications. For example, in the spring of 2007, after Estonia removed a Soviet military monument from its capital, some of Estonia's state (and private) web sites were the target of weeks-long denial of service attacks that crippled the sites' functionality.¹⁹

Proposed standards like DNS Security Extensions designed to make the critical Internet function of root zone management and name and address resolution more secure involve questions of national security and Internet governance.²⁰ Countries not involved in the development or control of such protocols and their embedded policies or not able to transparently view the underlying specifications could be disadvantaged in their ability to ensure that such standards meet their security needs.

One sphere that is more complicated is international information exchange. When such exchanges - and the technical standards that govern them - directly affect diplomatic relations, they implicate a core governmental function. Global trade policy is a particularly complex issue: whereas the actors directly engaged in carrying out global trade are usually non-state corporations, such trade occurs within a still-emerging thicket of bilateral and multilateral treaties and institutions that governments are deeply and continuously involved in negotiating.²¹ Standards are particularly relevant in this area because they can either facilitate or impede trade. The World Trade Organization's Agreement on Technical Barriers to Trade (TBT) recognizes the important role standards play in the facilitation of international trade and asserts that standards should not create unnecessary obstacles to trade. Intellectual property rights in standards can inhibit the adoption of international standards and the development of products based on these standards.²² Christopher Gibson argues that standards are increasingly emerging as non-tariff barriers (NTBs) and cites WAPI (Wireless Local Area Network Authentication and Privacy Infrastructure), the Chinese national standard for wireless LAN encryption, as a case study in this area.²³ As such, whereas the trend of the emerging global economic regime has been to lower traditional barriers to global trade, proprietary standards are increasingly emerging as alternative, non-pecuniary technical barriers to trade.

Democratic Values in Standards-Setting Processes

The previous three examples of the political implications of technical standards implicate a fourth area. Technical specifications have democratic implications with regard to their processes of creation and maintenance. Regardless of what sphere of public interest a standard affects, if a technological specification is of significant relevance to an issue of

¹⁹ See a description in the article, "A Cyber-riot" in *The Economist* (May 10, 2007).

²⁰ See generally, Brenden Kuerbis and Milton Mueller, *Securing the Root: A Proposal for Distributing Signing Authority*, Internet Governance Project White Paper (May 2007).

²¹ See generally, Hans Van Houtte, *THE LAW OF INTERNATIONAL TRADE* (2d ed. 2001).

²² Communication from the People's Republic of China, Background paper for Chinese Submission to WTO (G/TBT/W/251), *Intellectual Property Right (IPR) Issues in Standardization*, (November, 2006). Accessed at [http://research.yale.edu/isp/osis/papers/Baisheng %20Position%20Paper1.pdf](http://research.yale.edu/isp/osis/papers/Baisheng%20Position%20Paper1.pdf).

²³ See, e.g., Christopher Gibson, *Technology Standards—New Technical Barriers to Trade?* in *THE STANDARDS EDGE: GOLDEN MEAN*, (Sherrie Bolin, ed., 2007). Accessed at <http://ssrn.com/abstract=960059>.

political relevance, then the character of the processes resulting in its formulation are relevant to democratic values. The core questions democratic theory raises with regard to such processes are the same questions it poses to all decision-making procedures of public importance: whose voices and interests are allowed input into the decision and by what procedures are they weighed? The conditions under which such procedures occur are similarly relevant: if a standard is being developed by a private actor or a voluntary organization, then whether the public can freely access a specification and the records of the proceedings concerning its adoption and modification is a question of political relevance.

Despite the public consequences of ICT standards, some standards development processes are closed, require fee-based membership, exclude non-members, disallow individuals, and provide little room for public participation or oversight.²⁴ Such barriers to broad and roughly equal participation and public input are clearly at odds with contemporary understandings of legitimacy and transparency that democratic publics expect of their governments. Governments' reliance on standards created or managed under processes that significantly deviate from basic democratic values therefore potentially raises serious questions of democratic legitimacy.

III. AN EXPANDED DEFINITION OF OPEN STANDARDS

A. CONCEPTIONS OF OPENNESS

Economic definitions of open standards specify requirements primarily in terms of the standards' effect on market competition and therefore do not consider the democratic implications of technical specifications. Other definitions of "openness" are more expansive and account for both economic and political implications. For example, the European Union's "European Interoperability Framework for Pan-European eGovernment Services" is written with the political goal of furthering European unification and includes open standards as an essential requirement toward achieving the goal of interoperability of pan-European eGovernment services. The European Interoperability Framework describes "open" as meeting the following minimum requirements:

- The standard is adopted and will be maintained by a not-for-profit organization, and its ongoing development occurs on the basis of an open decision-making procedure available to all interested parties (consensus or majority decision etc.).
- The standard has been published and its specification document is available either freely or at a nominal charge. It must be permissible to all to copy, distribute and use it for no fee or at a nominal fee.
- The intellectual property—i.e. patents possibly present—of (parts of) the

²⁴ See, e.g., Alan Davidson, John Morris, and Robert Courtney, *Strangers in a Strange Land: Public Interest Advocacy and Internet Standards* 5-7 (September, 2002). Accessed at <http://www.cdt.org/publications/piais.pdf>.

standard is made irrevocably available on a royalty-free basis.²⁵

It is notable that this definition includes openness criteria for a standard's development process rather than exclusively focusing on the standard's economic effects following its development. The development process must be open to all, maintained by a non-profit institution, and embody democratically-oriented criteria of transparency and a majoritarian or consensual decision-rule. The implication is that the standards development *process*, which might include public policy decisions, is as pertinent to definitions of openness as the material *effects* of a standard. Another distinguishing characteristic of this definition is the requirement that any underlying intellectual property be made irrevocably available on a royalty-free basis.²⁶

The IPR policies of some standards setting organizations have asserted that intellectual property rights should be available under royalty-free terms but many also have adopted policies that the standard be available on a so-called “reasonable and non-discriminatory” (RAND) basis. Lemley's study, “Intellectual Property Rights and Standards-Setting Organizations,” describes the diversity of approaches to how standards bodies treat intellectual property, but finds that RAND licensing approaches are the most prevalent.²⁷ Although RAND licensing approaches are well-intentioned, their implementation can be problematic due to a lack of clarity over the meaning of “reasonable” and “non-discriminatory.” Lemley notes that most organizations with RAND licensing requirements do not specifically define RAND.²⁸ Undefined variables include whether IPR holders are obligated to license universally or just to other standards body members; what constitutes a reasonable royalty fee; and what constitutes reasonable and non-discriminatory substantive licensing terms. In practice, the requirement for RAND licensing often lacks a consistent or clear meaning—sometimes even within the same standards setting organization.

In addition to citing this definitional ambiguity, critics of RAND licensing practices usually question whether the Internet would have experienced such growth in numbers, geographic scope, and technological innovation if its underlying protocols (e.g. FTP, HTML, HTTP, and IP) had been controlled by a single vendor or group of vendors under RAND terms rather than made available on a public access basis. The World Wide Web Consortium (W3C), citing the objective of promoting ubiquitous adoption of web standards, has established a policy of issuing recommendations only if they can be implemented on a royalty-free basis, although there is a mechanism for allowing exceptions.²⁹ Ghosh notes that royalty-free policies—which may conflict with defensive suspension clauses in F/LOSS (Free/Libre Open Source Software) licenses—may too strict in some markets like mobile telephony and not stringent enough for office applications. In the case of *irrevocable* royalty-free terms, such rules could produce

²⁵ IDABC Working Document, *European Interoperability Framework for Pan-European eGovernment Services*, Version 4.2 9 (Jan. 2004). Accessed at <http://ec.europa.eu/idabc/servlets/Doc?id=1674>.

²⁶ Many irrevocable royalty-free policies include protections such as reciprocity and defensive termination clauses. See, for example, Lawrence Rosen, *Defining Open Standards*. Accessed at <http://www.rosenlaw.com/DefiningOpenStandards.pdf>.

²⁷ Mark Lemley, *Intellectual Property Rights and Standard-Setting Organizations* 7–8 (BOALT WORKING PAPERS IN PUBLIC LAW, Paper 24, 2002).

²⁸ *Id.* at 109.

²⁹ See the W3Cs patent policy at <http://www.w3.org/Consortium/Patent-Policy-20040205/>.

undesirable results such as potentially excluding Adobe's PDF as an open standard because of its revocable royalty-free terms.³⁰

Other definitions of "open standards" also focus on the standards setting process and issues of public participation, transparency, and accountability. The International Telecommunications Union (ITU) has defined open standards as those that are "made available to the general public and are developed (or approved) and maintained via a collaborative and consensus driven process."³¹ The ITU's openness definition also states that the standards setting process should not be dominated by any one interest and that a standard's specification should be articulated in detail sufficient to enable the development of heterogeneous competing products that implement the standard.

Ken Krechmer's frequently cited paper, "Open Standards Requirements," expands the definition of open standards further to include not only economic effects resulting from an open standard's implementation and openness in the process of standards setting, but also the concept of openness in use.³² Krechmer's requirements include openness criteria for development criteria such as participatory openness, due process, and consensus. He also includes requirements for the implementation of openness, including public document availability and IPRs that are not cost prohibitive, do not favor one competitor over others, and do not inhibit further innovation. Krechmer's definition also addresses openness requirements directed at technology users, including choice of vendor implementation, ongoing support for the standard over the life of the product implementing the standard, and backward compatibility with previously purchased implementations.

Open source advocate Bruce Perens further defines open standards by the *principles* he believes should underlie the development and adoption of technical specifications.³³ One of the principles Perens cites is maximization of user choice in that an open standard does not lock users into a single vendor's products. Another principle underlying open standards is non-discrimination. Institutions establishing open standards should not favor a particular vendor over other vendors. Perens also suggests that open standards should be ubiquitously available and capable of implementation on a royalty-free basis.

B. A MAXIMAL DEFINITION OF OPENNESS

These previous efforts at drafting openness requirements allow us to consider a definition of *maximal openness* for technical standards. We should state up front that we recognize that it would be impractical or implausible to impose the full requirements of maximal openness on most contexts. The point of stipulating this maximal definition is not, therefore, to advocate its implementation universally, but rather to fix ideas by defining one pole in the spectrum of potential standards policy options.

³⁰ See Ghosh, *supra* note 3, at 11.

³¹ See the ITU-T's Definition of Open Standards at <http://www.itu.int/ITU-T/othergroups/ipr-adhoc/openstandards.html>.

³² See Ken Krechmer, *Open Standards Requirements* (2005). Accessed at <http://www.csrstds.com/openstds.pdf>.

³³ See Bruce Perens, *Open Standards: Principles and Practice*. Accessed at <http://perens.com/OpenStandards/Definition.html>.

The most expansive definition of an open standard would encompass 1) requirements of maximal participatory openness and transparency in development; 2) the absence of hindrances to full competition and multiple competing implementations; and 3) requirements of maximum technical interoperability among heterogeneous systems and therefore user choice. In this context, an open standard is one that exhibits openness in development, openness in implementation, and openness in use.

Openness in Development

The most open standards development processes incorporate participatory openness, procedural fairness and transparency, and a maximally representative decision procedure.³⁴ Open membership organizations make participation available to all interested parties without regard to corporate affiliation, credentials, or government backing and without requiring membership fees. Procedural fairness and transparency include well-defined, published procedures for the standards development process and a public process for recording dissent, appealing decisions, or dealing with procedural violations. Such decisions must meet universal norms against self-dealing and procedural abuses. Transparency also includes disclosure of intellectual property, disclosure of organizational affiliations, and making electronic discussions, drafts, and meeting minutes part of a public record. As the ITU's definition of openness indicates, the decision-procedure should not allow a single interest or small subgroup to dominate decision-making, but instead require that any decision obtain broad representative agreement among participants.³⁵

Openness in Implementation

Standards are maximally open in implementation if they meet three criteria. The specifications are made available to those interested in implementing the standard and to the general public. There is no fee for accessing the specification. Finally, the standard is made available on an irrevocable commitment by its owner to refrain from charging royalties or otherwise enforcing patent claims to exclude anyone from using the standard in accordance with the principles of maximal openness, as has historically been the case with key Internet standards. If IPR relative to the implementation of a standard has not been disclosed during the development process, the IPR holder is prohibited from enforcing the patent against the standard's implementation. As Ghosh notes, the result

³⁴ The following requirements for maximal openness encompass many of the requirements described in the previous section, as well as Eddan Katz & Laura DeNardis, *Best Practices in Internet Standards Governance*, White Paper Submission to the Internet Governance Forum (Aug. 2, 2006). Accessed at http://www.intgovforum.org/Substantive_1st_IGF/BestPracticesforInternetStandardsGovernance.pdf.

³⁵ Although some groups have suggested a requirement of consensus, such a requirement is anti-democratic in many situations because it potentially enables minority dominance in favor of the status quo. Although Democratic theorists have long recognized that there exists no general solution for designing a decision-procedure that is perfectly immune from strategic behavior. See, e.g., Adam Przeworski, *Minimalist Conception of Democracy*, in *DEMOCRACY'S VALUE* 23, (Ian Shapiro & Casiano Hacker-Cordón eds., 1999). As such, we view do not view the concept of maximal openness as stipulating any particular democratic decision-procedure, but rather as embracing the norm of democratic representativeness generally.

of open standards can be multiple competing products based on the standard, and therefore maximal innovation among vendors developing these products.

Openness in Use

A completely open standard allows maximum technical interoperability between heterogeneous products. As Parens suggests, this openness maximizes user choice and precludes users from being locked into a single vendor's products.³⁶ Open standards provide backward compatibility in that ongoing changes to the same set of technical specifications do not require users with products based on previous versions of the standard to upgrade to new product suites in order to retain their existing level of functionality.

C. A MAXIMAL DEFINITION OF A CLOSED SPECIFICATION

In contrast to the many attempts to define an open standard, there have been fewer efforts to define a completely closed specification. First, we opt to not use the term "closed standard" because it would be somewhat misleading. A standard, by definition, is a blueprint that enables users to access, create, and exchange information regardless of their hardware or software choices. A completely closed "standard" is really a specification that is proprietary, meaning it is developed and owned by a single company that controls the development, use, and ongoing changes of the specification. Hence, we choose to use the term "closed specification" rather than closed standard. A closed specification is not made available for industry adoption and is intrinsically not interoperable with competing products. The following stipulates a definition of a closed specification to fix the antithetical pole of non-openness in the spectrum of potential standards policy options.

Closed in Development

A completely closed development process is one in which a technical specification is established by a single vendor with no avenue for the participation of other parties or the general public. In this single vendor development environment, issues of procedural fairness, recording dissent, or dealing with procedural violations are irrelevant. A completely closed development process also has no transparency. Meeting proceedings, minutes, and intra-company electronic discussions are not published and do not become part of a public record.

Closed in Implementation

Once a specification is developed, it is maximally closed in implementation if it is not made available for other vendors, even for a fee, to use to develop interoperable and competing products based on the specification. A closed specification is also not made available for public scrutiny. The specification's developer owns all intellectual property

³¹ See Parens *supra* note 29, at 1.

rights and does not license IPR to any other vendor under any terms. The result of this proprietary approach is that other companies are unable to develop interoperable, competing products based on the specification.

Closed in Use

In a completely closed environment, users become locked into a single vendor's products. To continue accessing, developing, or exchanging information based on a closed specification, users must rely on the single vendor to continue developing products based on that specification or that provide adequate backward compatibility.

IV. WHEN OPENNESS MATTERS MOST

The most plausible economic analyses of open standards employ a narrower definition of openness in terms of a standard's implications for competition and conclude that open standards are generally desirable for promoting competition. As the preceding discussion revealed, democratic political discourse gives rise to a range of values and potential concerns far broader than efficient competition and implicates a far broader range of social contexts than market exchange. Section III demonstrated that "openness" implies a number of social and economic dimensions. However, as we noted, these definitions indicate two poles in the spectrum of potential standards options that vary contextually. The key question in considering the appropriate standards design requirements is not "open or proprietary?", or "how much openness?", but rather "what openness requirements are appropriate to *this* context?" In this section, we aim to set down some guidelines as to the contexts in which democratic values require a greater degree of openness in both the substance of technical standards and their development, and then consider these imperatives in the particular context of government documents.

A. DEMOCRATIC IMPERATIVES FOR OPENNESS

Our observations in Section II concerning the various ways in which technical standards potentially raise democratic implications can help us determine when democratic values require greater openness. As that Section noted, *any* standard with a potential impact on an issue of potential public concern can raise democratic concerns with regard to the publicity and inclusiveness of the standard-setting procedure. The more a standards development process or organization fulfills the desiderata of participatory openness, representativeness, transparency, and procedural fairness, the greater degree to which it promotes democratic values with regard to that technical context, since these norms make it more likely that a decision process will fairly and effectively incorporate the perspectives and interests of a greater number of stakeholders. However, the benefits of open and democratic procedural values can also entail costs—for example, the time and logistical costs of organizing and engaging in democratic deliberation and decision-making, as well as the cost of acquiring enough information to participate—and such values may not be relevant to every context, or relevant enough to overcome the costs.³⁷

³⁷ Borrowing from Ian Shapiro's theory of democracy, democratic procedures and the values they fulfill

Furthermore, the democratic values that the requirements of openness promote are far more relevant to some contexts than others.

Section II points to several areas in which respect for democratic values clearly demands a high degree of openness. With regard to a technical standard that concerns a *formal democratic process*, openness in the specification's implementation and in the public's ability to access and amend potential problems with its implementation are absolutely crucial. The integrity of democratic processes also requires openness in such a standard's development process so as to ensure that the government has the capacity to oversee and correct any potential means of abusing the process that is affected by the technical standard. For example, the integrity of voting processes is absolutely crucial to an elected government's legitimacy. Transparency with regard to such standards is necessary to maintain the polity's faith that the government that prevails in an election is actually the one that won the most votes. Requiring a fee for access to the standard's specification would limit some citizens' ability to verify the integrity of electronic voting, therefore resulting in unequal opportunities for oversight over and trust in such procedures. Such inequality is unacceptable, as formal democratic processes concern the very basis of legitimate authority in a democratic regime. Royalties with regard to *use* of standards in this area may be acceptable so long as they do not give rise to inequalities between jurisdictions with regard to the kind of voting technology they can use, or provide citizens with different incentives for voting. Ensuring full competition in this area is important if the technology involved in a specification interacts with consumer technologies that citizens are expected to possess then openness in the economic sense of allowing for full competition becomes very important. On the other hand, if the technology does not involve any interface with other technologies and there exist strong reasons for concentrating control over the production of such technologies, then competition effects may be irrelevant.

With regard to standards that directly affect conditions relevant to democracy, the most prominent examples consist of standards that affect citizens' access to information concerning government decisions as well as standards concerning government records. The importance of accountability renders openness of implementation and use similarly important in this context. Equal and open access to government information serve to legitimate the exercise of formal government power, even though such access may have only an indirect relation to the operations of such processes. The retention of government records serves the same purposes over the long term.

Some requirements of openness of use may be broader for standards that affect conditions of democracy: whereas standards relevant to formal democratic processes tend to come into play on discrete occasions, standards relevant to the *conditions* of democracy are continually relevant. Consequently, the standards that affect such conditions must be continuously free of barriers to the widespread use of the relevant access technology. Democratic values are inconsistent with differential costs in the form of royalty fees or interoperability barriers that potentially result in unequal citizen access to such information. Openness in development is also very important, as the effect of the

and promote are, in many circumstances, goods "subordinate" to the activities and values arising from the subject of the decision itself. See SHAPIRO, *supra* note , at 21–24. We do not, however, necessarily agree with Shapiro's conclusion that democratic participation and the values arising from it are *never* intrinsic or constitutive goods.

specification's design potentially affects the ability of all citizens to engage in the democratic process and therefore constitutes a fundamental concern of the community. And as with standards concerning formal democratic process, if the technology involved in a specification interacts with citizens' consumer technologies, then openness in the economic sense is similarly important. On the other hand, although it is similarly important that the public possess the capacity to oversee, access, and modify technical specifications concerning the conditions of democracy, the general concern is less exigent. This is because the potential for manipulation or cataclysmic failure does not exist in the same way it does for discrete formal democratic processes.

On a broader cultural level, standards concerning technologies and structures involving large-scale communication or interaction can significantly shape a population's orientation toward social interaction, political critique, and technological innovation. For example, Yochai Benkler has provided an account of how policy choices in America during the 20th century, including licensing and standards decisions, contributed to the development of mass industrial media structures that tended to promote a relatively passive and frequently uncurious political culture among a large swath of the general population.³⁸

In contrast, the spectacular innovation and flourishing discursive sphere that have arisen during the Internet's early development can be significantly credited to the open standards that comprise the network's sinews. Standards such as TCP/IP (Transmission Control Protocol/Internet Protocol) and HTML (Hypertext Markup Language), which have been openly available to access and use, have provided individual citizens with the opportunity to contribute to this innovation and flourishing discursive sphere. These open standards have therefore helped give rise to a culture that simultaneously promotes individual freedom, communal collaboration, and creative innovation—values that are helpful to sustaining both democratic and economic progress.

With regard to standards that do not directly affect democratic processes or conditions, but instead affect issues of potential political concern, the root question is *who* appropriately controls the standard's development and its potential effects on the public interest. The greater degree to which an issue involves a core government function, either because the public views it as a public obligation or demands broad citizen input, the more important openness of development becomes. Mission-critical domains such as national security and disaster response should not depend on standards that potentially allow private interests to trump public interests in shaping the standard and its consequences or to encumber a standard's implementation. Once the polity has established the appropriate level of public input with regard to a standard, the resulting procedure will presumably give appropriate weight to the openness values to be embodied by the standard. For example, assuming that the public sufficiently participates in the development of standards for technology relevant to defense or disaster response, its representatives will, after considering all of the relevant cost-benefit and risk factors, presumably demand that these standards meet interoperability requirements to an appropriate degree.

³⁸ THE WEALTH OF NETWORKS 176–210 (2006).

B. THE IMPORTANCE OF OPEN GOVERNMENT DOCUMENTS

With our theoretical framework in place, we can now consider the particular function of documents and document formats for a democratic regime and the reasons open document standards are important for democratic governments.

As instruments of communication, documents play a crucial role with regard to several conditions of democracy. Their relatively fixed form gives them a particular place in the exercise and justification of formally authorized power. Individual citizens' capacity to access government documents significantly affects their capacity to participate in and critique public decisions. It is impossible to engage in successful public debate or reasoned critique of government action without firm knowledge of the content and implications of these actions, the latter of which is usually most efficiently assessed either by the government authorities themselves or by other public authorities tasked with oversight responsibilities.

Beyond their role in disseminating information, documents also give government decisions and their justifications concrete and objective reality, which allow the citizenry common points of objective reference for public debate and critique. The same information might not as effectively serve as a resource or subject of debate if not fixed in a document, as it would be costly or perhaps impossible to obtain agreement concerning the precise content of a decision or its justification. It is no coincidence that when government officials engage in unscrupulous activity, they usually aim to minimize or obscure their paper trails.

The relatively fixed nature of documents also serves the valuable role of promoting the values of transparency and accountability in several connected ways. First, a written record of government action greatly lowers the costs of conducting public oversight. By providing a fixed record, documents also commit government officials to prior justifications. Second, a fixed record makes it possible for citizens to re-examine the justifications and implications of prior decisions and to reconsider them when making future decisions.

It is evident that document formats have significant democratic implications, depending on the application's context. In general, the format of publicly accessible documents serves as an important condition of democracy. As we argued above, it is therefore necessary that standards relevant to accessing government documents and records generally remain free of barriers to the format's widespread public use. Due to the information technology revolution, citizens commonly access electronic documents through the use of personal computers and other consumer electronic devices. Such access cannot be restricted by potentially discriminatory barriers in the form of royalty fees or interoperability barriers. Technical specifications for government documents must allow for full competition in the manufacture of products for accessing and using such documents. Given the importance of documents to the communicative processes that constitute the lifeblood of both formal and informal democratic activities, it is clear that the entire polity has a stake in the implications flowing from the government's technical specifications for its documents.

These concerns may be intensified with regard to documents used in formal democratic processes, or documents that play a central role in the execution or maintenance of functions for which government possesses a particular responsibility.

Regarding formal democratic processes, if a government implements a system of formal political participation—for example, electronic voting or voter registration—that requires citizens to access and complete electronic documents, it is absolutely necessary that such access does not discriminate among users based on their choice of systems, as such discrimination would constitute a direct affront to basic equality of citizenship.

The imperatives arising from core government functions in which documents and their formats play a core role varies contextually. However, given that such domains are typically those that involve long-term recordation and archiving—for example, the maintenance of national archives or vital personal records related to basic aspects of a citizen’s social identity, such as birth, citizenship, and health—it appears we can say that ensuring sufficient backwards compatibility and interoperability are crucial to these domains. If such records are ones that citizens or the general public legitimately expects to be able to access, then the non-discrimination principle also applies. Finally, security concerns of the highest order arise with regard to documents that record basic aspects of a citizen’s social identity. Citizens have a right to hold their government accountable for ensuring the highest order of security, privacy, and reliability for such documents. Such accountability is not possible if the government employs a proprietary or otherwise closed document specification whose security vulnerabilities cannot be fully considered by the public.

V. GOVERNMENT PROCUREMENT POLICIES BASED ON OPEN STANDARDS

Governments are increasingly establishing policies mandating that ICT technologies used to create, exchange, view, and store government documents meet various criteria of openness in their specifications. The following sections examine the rationales for open standards policies within a few of the local and national jurisdictions that have instituted these policies. Specifically, we describe the open standards policies of the Commonwealth of Massachusetts, the National Archives of Australia, Belgium, and Brazil.

A. THE COMMONWEALTH OF MASSACHUSETTS

The first prominent government policy addressing open document standards emerged in the United States in the Commonwealth of Massachusetts. In January, 2004, the Massachusetts Information Technology Division (ITD) published an “Enterprise Open Standards Policy.” The policy emphasized that open standards promoted government efficiency and cost effectiveness, helped ensure compliance with agencies’ technical requirements for interoperability, and advanced the interest of citizens. The Massachusetts policy stated that an open standard has the effect of enabling multiple competing and interchangeable products:

Open Standards [are] [s]pecifications for systems that are publicly available and are developed by an open community and affirmed by a standards body. Hypertext Markup Language (HTML) is an example of an open standard. Open standards imply that multiple vendors can compete

directly based on the features and performance of their products. It also implies that the existing information technology solution is portable and that it can be removed and replaced with that of another vendor with minimal effort and without major interruption.³⁹

Accordingly, the policy stipulated that prospective IT investments in the Commonwealth adopt the open standards described in the state's Enterprise Technical Reference Model (ETRM), an architectural framework identifying the standards that should be used in Massachusetts state government information technology architectures. In 2005, the Commonwealth released an ETRM listing technical standards required for all subsequent information technology investments. The architectural framework divided technology areas into six categories: access and delivery, information, application, integration, management, and security. Within these categories, most of the specified standards were those already in widespread use in the Commonwealth or globally. For example, the reference model specified 128-bit encryption and X.509 v.3 digital certificates for web browsers and universal protocols such as Hypertext Transfer Protocol (HTTP)/1.1, Secure HTTP (HTTPS), Simple Object Access Protocol (SOAP) v. 1.2, Hypertext Markup Language (HTML) v. 4.01, and Extensible Markup Language (XML).⁴⁰ Within an "open format" subcategory of the information domain, the model specified the use of OASIS Open Document Format for Office Applications (ODF) v. 1.0, Plain Text Format and Hypertext Document Format v. 4.01. Portable Document Format (PDF) v. 1.5 was listed in a category of other acceptable formats.

The Commonwealth's inclusion of ODF in the lengthy list of required technical standards for new government IT procurements engendered strong reactions from various interests. Also referred to as OpenDocument, ODF is an XML-based document file format for office applications such as word processing documents, spreadsheets, and presentations. ODF is not a software application but a technical blueprint establishing common rules for structuring information contained within documents so they can be created, exchanged, and stored by any ODF-compliant application. This is somewhat analogous to the widespread ability to exchange audio files among applications adhering to MP3 or other audio formats. A standards institution called the Organization for the Advancement of Structured Information Standards (OASIS) ratified the ODF specification in May of 2005, and assumed responsibility for maintaining and updating the technical specification.⁴¹ The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) ratified OpenDocument as an international standard (ISO/IEC 26300) in 2006.⁴²

³⁹ Information Technology Division of the Executive Office for Administration and Finance, Commonwealth of Massachusetts, Enterprise Open Standards Policy (Policy #: ITD-APP-01) (Jan. 2004). Accessed at http://www.mass.gov/Aitd/docs/policies_standards/openstandards.pdf.

⁴⁰ For a complete list of specified standards, see the Enterprise Technical Reference Model—Version 3.5, Effective Date Sept.21, 2005. Accessed at http://www.mass.gov/Aitd/docs/policies_standards/etrm3dot5/etrmv3dot5intro.pdf.

⁴¹ OASIS Press Release, *Members Approve OpenDocument as OASIS Standard*, (May 23, 2005). Accessed at http://www.oasis-open.org/news/oasis_news_OS_23_05.php.

⁴² International Organization for Standardization (ISO) Ref.:1004, *ISO and IEC Approve OpenDocument OASIS Standard for Data Interoperability of Office Applications*, (May 8, 2006). Accessed at <http://www.iso.org/iso/en/commcentre/pressreleases/2006/Ref1004.html>.

The Massachusetts government primarily used Microsoft Office applications and other software based on proprietary standards for text, spreadsheet, and presentation documents. The formatting structures underlying office products like Microsoft Office have historically been proprietary—they are unpublished specifications not available for other vendors to create competing, interoperable software products. Rather than continue to use proprietary structures, the Commonwealth selected the OpenDocument specification, which is available for anyone to access gratis from the OASIS web site.⁴³ Additionally, the standard can be implemented on a royalty-free basis, presumably producing the effect of enabling competing vendors to manufacture and sell interoperable products and providing the possibility of heterogeneous software choice for users. Recall that one of the criteria for openness that Massachusetts stressed was multiple, competing products based on the standard to avoid predicating future access to public documents on a single vendor's proprietary specification. In the case of ODF, some examples of software applications compliant with the standard included Google Docs, IBM Lotus Symphony, StarOffice 8, and the open source and freely available OpenOffice 2.0.

According to Eric Kriss, then Massachusetts' Secretary for the Executive Office of the Administration of Finance, the state's reasons for adopting ODF included not only economic and technical concerns, but also the political justification of eliminating the potential implications of giving a single corporate interest, in this case Microsoft, the capacity to limit access to state documents through proprietary formats and intellectual property restrictions. Kriss often described the political aspect of document standards in terms of government sovereignty. In a public statement about the importance of open document formats in the context of the government's obligations to provide long-term accessibility to public records, Kriss argued:

It should be reasonably obvious for a lay person who reflects on the concept of public records that the government must keep them independent and free forever. It is an overriding imperative of the American democratic system that we cannot have our public documents locked up in some kind of proprietary format, perhaps unreadable in the future, or subject to a proprietary system license that restricts access.⁴⁴

The Massachusetts ODF decision, on the surface a recommendation involving an esoteric technical standard, attracted considerable attention and controversy, including a strong reaction from Microsoft, which had an obvious economic stake in retaining the large installed base of Office products in the Commonwealth. At the time, Microsoft was also in the process of introducing a new version of its Office suite, Office Open XML (called OOXML or Open XML), based on an XML document standard rather than the proprietary binary formats underlying previous versions of Office.

According to one historical account of the ensuing melee, criticisms of the

⁴³ The Open Document Format for Office Applications (OpenDocument) v1.0 specification can be downloaded from <http://www.oasis-open.org/committees/download.php/12572/OpenDocument-v1.0-os.pdf>.

⁴⁴ Eric Kriss, Secretary for the Executive Office of the Administration of Finance for the Commonwealth of Massachusetts, *Informal Comments on Open Formats* (January 14, 2005). Accessed at <http://consortiuminfo.org/bulletins/sep05.php>.

Commonwealth's decision included questions about migration costs, the standard's functionality, the potential to disadvantage proprietary products in procurement bids, the standard's ability to address the accessibility needs of disabled workers, and the extent to which the decision was reached in an open and democratic manner.⁴⁵

In the ensuing political turmoil of the Commonwealth's decision, three critical leaders resigned their posts, all amid controversy. These included Kriss; Peter Quinn, the CIO of the ITD; and later the new CIO of the ITD Louis Gutierrez. In the meantime, Microsoft's Open XML format was approved by the standards consortium Ecma International, which would make the standard freely downloadable from its web site. Some of the criticisms of this format include the following: that areas of the standard are undocumented to the extent that others would not be able to reproduce key features; that the standard does not take advantage of existing and relevant global standards; that it is ultimately controlled by a single vendor; and that Microsoft's patent protection promise not to sue only pertains to explicit components of the standard and not undocumented and implied components of the standard.⁴⁶

Following a series of resignations, administration changes, and mounting political pressure, the end result was that the next iteration of the Enterprise Technical Reference Model, ETRM v. 4.0, expanded the specifications for Massachusetts' "open formats" category to include OOXML, now called Ecma-376, as well as OpenDocument v. 1.1.⁴⁷ In *Inventing the Internet*, historian of technology Janet Abbate describes how "standards battles can bring to light unspoken assumptions and conflicts of interest. The very passion with which stakeholders contest standards decisions should alert us to the deeper meanings beneath the nuts and bolts."⁴⁸ The Commonwealth of Massachusetts' open standards case illustrates how politics and technical standards can potentially collide.

B. THE NATIONAL ARCHIVES OF AUSTRALIA

The National Archives of Australia (NAA) selected ODF as the standard for its digital preservation of public documents and similarly linked the open standard with conditions relevant to democracy such as transparency, openness, and public accountability. The NAA preserves federal government records dating back to the 1901 inception of the Commonwealth of Australia, and includes some nineteenth century documents. The Archive's holdings include Prime Ministers' records, cabinet documents, and federal

⁴⁵ Rajiv Shah and Jay Kesan, *Open Standards and the Role of Politics*, THE PROCEEDINGS OF THE 8TH ANNUAL INTERNATIONAL CONFERENCE ON DIGITAL GOVERNMENT RESEARCH, Philadelphia, Pennsylvania, vol. 228, 7 (May, 2007).

⁴⁶ See, for example, Sam Hiser, *Achieving Openness: A Closer Look at ODF & OOXML* (June, 2007). available at http://fussnotes.typepad.com/Achieving_Openness_1point0.html; and the ODF Alliance's "The Technical Case Against DIS 29500/OOXML" available at www.odfalliance.org.

⁴⁷ See the Commonwealth of Massachusetts' Enterprise Technical Reference Model—Version 4.0, Effective Date August 1, 2007, available at [http://www.mass.gov/?pageID=itdterminal&L=4&L0=Home&L1=Policies%2c+Standards+%26+Guidance&L2=Enterprise+Architecture&L3=Enterprise+Technical+Reference+Model+-+Service-Oriented+Architecture+\(ETRM+v4.0\)&sid=Aitd&b=terminalcontent&f=policies_standards_etrmv4_etrmv4dot0intro&csid=Aitd](http://www.mass.gov/?pageID=itdterminal&L=4&L0=Home&L1=Policies%2c+Standards+%26+Guidance&L2=Enterprise+Architecture&L3=Enterprise+Technical+Reference+Model+-+Service-Oriented+Architecture+(ETRM+v4.0)&sid=Aitd&b=terminalcontent&f=policies_standards_etrmv4_etrmv4dot0intro&csid=Aitd).

⁴⁸ Janet Abbate, *Inventing the Internet*. Cambridge: The MIT Press (1999), page 179.

government files related to such areas as national defense, intelligence, and immigration. The NAA describes its mission as “help[ing] government to account to the public, [and] ensuring that evidence is available to support people’s rights and entitlements and that future generations will have a meaningful record of the past.”⁴⁹

In March of 2006, the NAA announced it would update its digital preservation software to support ODF. A significant consideration in the NAA’s ODF decision was how best to ensure the longevity of electronic public records, as many government agencies in Australia have unreadable electronic records.⁵⁰ Digitally stored information can become inaccessible for many reasons: the physical storage medium, whether mechanical, magnetic, optical, or electronic, may no longer be easily accessible; the software application required to read a proprietary document format may no longer be available; and newer applications, even based on the same proprietary product family, may not be backward compatible with previous formats. The NAA, like other digital archives, has acknowledged that these barriers to electronic storage longevity have created a situation in which paper storage, in practice, outlasts electronic storage. The NAA selected ODF because it believed this open standard, in contrast to proprietary formats, would support its obligation to ensure the durable and accessible archival of digital public information. The presumption is that an open standard that is publicly accessible, developed and maintained by multiple interests in an open institutional process, and ratified as an international standard, would have greater longevity, product availability, and ongoing backward compatibility. An interesting aspect of the NAA’s standards strategy is that the agency is both a user and developer of the standard—the NAA actively participated in the format’s development in conjunction with the OASIS standards group. This opportunity for participation by an expanded circle of stakeholders clearly demonstrates an advantage of standards developed through open processes.

As part of its standards policy, the NAA would still receive information in all file formats but would use its Xena preservation software, along with OpenOffice 2.0—open source software supporting the ODF standard—to convert documents into ODF. Xena, short for XML Electronic Normalizing of Archives, is XML-based open source software the Archives have made available for use or comment by any interested party.

Government agencies contributing electronic archives to the NAA’s electronic repository submit documents in numerous formats and one of the NAA’s policies is to accept any document format rather than mandating a single standard. The NAA’s archiving strategy also includes storing the electronic documents in their original formats.⁵¹ This would give citizens the choice of viewing the electronic files with an ODF compliant application or using the application that originally created the file. Those users who want to access a file in the ODF format have the option of deploying one of two free solutions—either OpenOffice or Google Docs—to view, edit, and save documents in ODF.

⁴⁹ National Archives of Australia’s web site, *accessed at* http://www.naa.gov.au/about_us/about_us.html.

⁵⁰ Australian Government, National Archives of Australia, *Digital Preservation: Illuminating the Past Guiding the Future* (June 2006,) p. 13. *Accessed at* http://www.naa.gov.au/recordkeeping/preservation/digital/XENA_brochure.pdf.

⁵¹ National Archives of Australia, Open Source Digital Preservation Software from the National Archives of Australia, <http://www.xena.sourceforge.net/index.html>.

C. BELGIUM

In June 2006, Belgium’s federal Council of Ministers approved a proposal to adopt ODF as Belgium’s standard document format for exchanging office documents such as text files, spreadsheets, and presentations within the federal government.⁵² The proposal suggested that all federal administrations would be able to read ODF files beginning in September 2007, and be equipped to use ODF for document exchange by September 2008. Individual departments within the federal government would determine how they would meet these requirements—for example, agencies might indirectly fulfill the requirements by using software translation tools to convert existing formats, and as such continue to use their choice of productivity suite, or they could directly fulfill it using ODF compliant software such as OpenOffice.

Belgium had previously (2004) developed an “open standards” framework (including definitions and guidelines) designed to promote national interoperability and to facilitate access to digital public information. The Belgian Government Interoperability Framework (BELGIF) initiative, a collaboration between federal and regional governments, was a first step towards defining the “open standards framework” scope and governance model. The interoperability framework divided technical standards into four categories: data presentation and exchange; data integration and middleware; interconnection services; and security services.

Belgium defined an “open standard” as being available online (freely or at minimal cost) and in sufficient detail to develop a fully functional implementation; as having no legal restrictions; and as recognized by an international standards body.⁵³

The Belgian Interoperability Framework itself adhered to principles of openness in development in that it provided a direct avenue for public participation, oversight, and consultation. The interoperability framework’s initial list of standards was made available for public comment and consultation on a BELGIF wiki website based on MediaWiki software and available in French, Dutch, and English.⁵⁴

Belgium’s rationale for adopting ODF had technical, political, and economic elements. The strategy sought to solve technical incompatibility between office applications used throughout the government. Office documents had historically been created and stored in incompatible office suite formats such as Corel WorldPerfect Office, Microsoft Office, and OpenOffice. The federal government had previously experienced incompatibility problems when attempting to exchange documents stored in multiple formats. As collaboration among government agencies continued to become more interactive, interoperability became increasingly important. The decision to adopt ODF was a proactive step to avoid problems in the future with incompatible office suite formats, to avoid single vendor lock-in, and to guarantee long-term access to information independent of the application that created the information.

⁵² Belgian Federal Council of Ministers, *Open Standards: Belgium’s Federal Council of Ministers Approves ODF*, Press Release (June 7, 2006). Accessed at <http://presscenter.org/repository/news/264/en/2648eda677208241081d4d8e02c22975-en.pdf>.

⁵³ Belgian Federal Public Service ICT (FedICT) eGov Report, Update on Open Standards Initiatives in Belgium (2005). Accessed at http://www.siiia.net/govt/docs/pub/Belgium_FEDICT_OpenForumEurope_060704.pdf.

⁵⁴ See the archives of the public wiki consultation for the Belgium Interoperability Framework (BELGIF) at http://www.belgif.be/index.php/Main_Page.

Economically, the strategy projected that adherence open standards would reduce IT costs by avoiding single vendor lock-in. It would also provide cost savings to citizens who would have a choice of products, including freely available products, with which to access government documents. Presumably, the availability of competing products based on the same standard would lower user costs. Finally, the strategy includes the political rationales of providing ubiquitous and equitable public access to electronic government documents and ensuring that citizens are not compelled to purchase a proprietary product.

Finally, Belgium's interoperability strategy, while specifying ODF, stated that it might in the future recognize other standards, such as Office Open XML (OOXML), as meeting with its approval, as long as the alternative standard is compatible with the previously selected standard, as long as there are multiple implementations based on the standard, and as long as the standard is recognized by the ISO.⁵⁵ Open XML was, however, initially rejected as an ISO standard in September, 2007 in a fast-track approval process by ISO national member ballots, with a ballot resolution meeting scheduled for February, 2008.

D. BRAZIL

In late 2006, the Brazilian federal government introduced an interoperability architecture establishing the adoption of open standards, making Brazil the first South American country to officially recommend ODF. Brazil's conception of interoperability addressed internal government communications and information exchange with citizens, as well as the more global objectives of interacting with businesses and governmental trading partners and competing in global economic markets. The government established interoperability as a requirement for effective governmental provisioning of public services and for efficient economic stewardship of public ICT investments. Three agencies within the federal government spearheaded the development of Brazil's interoperability architecture: the Ministry of Planning, Budget, and Administration's Secretariat of Logistics and Information Technology; the National Institute for Information Technology of the Presidency of the Republic; and the Federal Data Processing Service, a public company within the Treasury Department.⁵⁶

Brazil modeled its definition of interoperability on conceptions that other governments and institutions had already developed.⁵⁷ Brazil defined interoperability primarily in terms of a specification's effects: a structure is interoperable if it ensures the capacity to exchange information among heterogeneous systems and provides users with a choice between multiple competing and compatible technologies. This definition is based on principles of diversity, heterogeneity, and choice, in contrast to architectures that result in single vendor lock-in.

With interoperability as the overarching requirement, the federal government established general policies to guide its selection of specific technical standards. These

⁵⁵ See Presentation by Peter Strickx, *Technical Aspects of Standards* (Feb. 2, 2007). Accessed at <http://ec.europa.eu/idabc/servlets/Doc?id=27858>.

⁵⁶ Brazil's e-PING architecture (English translation), at 12.

⁵⁷ Brazil's interoperability definition draws upon frameworks developed by the British government, the Australian government, the ISO, and the European Institute of Computer Science.

policies can be summarized as follows: technical specifications must comply with the dominant standards underlying the Internet, including the World Wide Web, and use browser software as the preferred information access mechanism; specifications should be XML-compliant where applicable and adopt standardized metadata approaches based on internationally accepted standards; the specifications should have market support and be scalable to changing demands and uses; the e-PING documentation should be transparently available to the public and have some mechanism for public evaluation and feedback; and the technology underlying electronic government services should provide user privacy and respect legal restrictions on information access and dissemination.

Finally, the Brazilian federal government established the following overarching technical policy:

Preferential adoption of Open Standards—The e-PING defines that whenever possible open standards will be adopted while establishing technical specifications. Proprietor [sic] standards are accepted until there are migration conditions. The situations where there is a need to account for information safety and integrity requirements will be dealt with appropriately. When available, free software solutions will be considered preferential, in keeping with the policies defined by the Electronic Government Executive Committee (CEGE).⁵⁸

Brazil's e-PING interoperability framework recommends specific technological standards on the basis of their compliance with these overarching policies, including the open standards requirement. Rather than imposing a strict binary categorization of standards as either "accepted" or "rejected," the Brazilian interoperability framework classifies specifications into one of five categories of compliance. *Adopted* standards are compliant and have passed through a formal review process; *Recommended* standards comply with Brazilian policies but have not yet passed a formal review process; *In Transition* standards are specifications that are widely used but do not comply with policies and will eventually be replaced unless they become compliant with policies; other standards are classified as *Under Evaluation* or, if not yet appraised, classified for *Future Consideration*.

Some of the interoperability framework's recommended standards, among pages and pages of technical recommendations, include well-known interconnection protocols such as HTTP/1.1, SMTP/MIME, SIP, SMS, TCP, and UDP. In the category of technical specifications for document files, the interoperability framework recommends OpenDocument (.odt) as well as other standards such as PDF and Rich Text Format (RTF). It assigns the in transition classification to Microsoft's proprietary Word (.doc) format, up to MS Office version 2000. The technical specifications similarly recommend OpenDocument .ods for spreadsheet files, .odp for presentation files, .odb for data files,

⁵⁸ Brazilian Government Executive Committee on Electronic Government, e-PING Standards of Interoperability for Electronic Government, Reference Document Version 2.0.1 (Dec. 5, 2006) at 9, (translated by the Brazilian government). Accessed at http://www.governoeletronico.gov.br/governoeletronico/publicacao/down_anexo.wsp?tmp.arquivo=E15_677e-PING_v2.0.1_05_12_06_english.pdf.

and .odg for graphic information.⁵⁹

In short, Brazil selected OpenDocument as the preferred format for federal government documents while assigning defining its installed base of Microsoft proprietary formats as in transition. The e-PING standards are mandatory for new information system procurements and for updates to existing systems within the executive branch of the federal government. Brazil's policies explicitly state that they cannot be imposed upon citizens or on government entities outside of the federal government, but call for voluntary adherence to the interoperability framework.

VI. CONCLUSION

This paper has considered democracy-promoting principles of standards design ranging from concerns with certain procedural values in decision-making to the effects of standards design on political authorization and representation. Economic definitions of open standards view openness as generally desirable to promote competition. Democratic political discourse implicates a far broader range of social contexts and concerns. As our preceding discussion indicated, democratic inquiry into standards leads not to the binary question of “open versus proprietary” but to the question of what openness requirements are appropriate in any given context. Openness is crucial for technical standards addressing a formal democratic process or affecting issues of potential political concern such as national security and disaster response. Openness is also essential for standards that directly affect conditions relevant to democracy. In our analysis, we emphasized the particular importance of open document standards for democratic governments.

Furthermore, our selected case studies provided examples of governments establishing requirements that technology used to create, exchange, view, and store documents meet various criteria of openness. Our examination of these open standards policies reveals several themes. First, each government entity that has established an open standards policy cited expressly political rationales as well as economic and technical reasons in its justification for preferring technologies based on open standards. The political rationales emanated from the desire to promote the democratic values of transparency, openness, user choice, and public accountability, as well as the imperatives flowing from distinctly public obligations such as the digital archiving of public records. Economic and technical requirements of course also shaped these open standards policies: the government entities were concerned with improving interoperability between heterogeneous systems, reducing ICT expenditures by avoiding vendor lock-in, and promoting economic competition through selecting standards with multiple competing product implementations. Second, the selection of open standards occurred most expeditiously when undertaken in a generally transparent and open manner with avenues for public review and comment. Many government open standards policies also emanate from broader “interoperability frameworks,” which establish guiding principles for openness and interoperability in government interactions with citizenry. Third, the governments in all four scenarios took the same general role in promoting open standards. In promoting the use of open standards, governments potentially could act in one of three possible roles—as a regulator, developer, or procurer of standards. In all of

⁵⁹ These specifications all fall under the ISO/IEC 26300 standards.

the cases we investigated, the government entities opted for the limited role of procuring technology based on open standards. The partial exception was the National Archives of Australia, which served as one of many participants in the development of ODF. Finally, governments' open standards policies stressed the importance of the availability of multiple, competing products as an evidential criterion of openness, such as ODF's status as the common standard for competing products such as Google Docs, IBM Lotus Symphony, StarOffice, and OpenOffice.

Both the theoretical and applied sections of this paper make it clear that document standards have political implications for democratic governments. Free and open access to many types of government documents is crucial for democratic government, either because ensuring dependable, equal, and free access constitutes a condition of democracy, or because the provision or recordation of certain documents constitute core public duties. It is evident that the government document standards policies we studied in this paper acknowledge the political reasons for open standards, as they did not only focus on cost-efficiency or other purely economic imperatives, but were significantly concerned with promoting distinctly political values—either invoking the specific values of democratic equality of access or public responsibility that we articulated in this paper, or closely related values, such as the principle of citizen choice or government independence from proprietary control. We can conclude that in the present context, movement towards openness in technical standards by both governments and vendors is highly beneficial for citizens who care about democratic values.