

The Importance of a Neutral or Multiple-Standards Policy in Document Format Standards – ABRIDGED

This paper is intended to guide or supplement government policies and evaluations around document format standards. This compilation of best practices, references, studies, and examples can be used by policymakers and those who evaluate policies around country or state positions and mandates to ensure that they minimize disruptions and maximize value. Production of this compiled paper is made possible by Microsoft Corporation.

Also see more detailed paper by the same name

EXECUTIVE SUMMARY

Governments worldwide are committed to providing reliable citizen services and ensuring the effective use of document formats to create, modify, and archive electronic documents to:

- Ensure that **government workers** can send and receive documents in formats that meet the needs of the situation.
- Ensure that **citizens and businesses** have freedom of choice in their communication with the public sector. Citizens and businesses must also have access to publicly-stored historical documents in heterogeneous environments using a format that can be opened and read by all for perpetuity.
- Ensure that **software developers and companies** of all kinds deliver interoperable products and services that add value to any platform. This encourages software procurement policies that promote healthy competition by preventing the use of asymmetric tactics that can disrupt markets.

With these goals in mind, governments work to minimize disruptions and maximize value around demands to interact with documents, effective internal government processes, and grow the economic opportunities in their country or state.

Today, efforts are underway to ensure that government documents use formats that will remain available for decades into the future, regardless of the applications used to access them. Because governments and organizations use data and documents in different ways, most have embraced a public policy of neutrality that uses multiple standards including both ODF and Open XML, allowing government agencies to choose the document formats that best serve their needs.

This policy of choice fosters greater innovation, enhanced customer options, and lower costs. Plus, it allows governments and citizens to achieve the essential goal of document exchange, while not being limited to one technology, one standard, or one company. When determining standards, governments should consider the longevity of the standard, and the interoperability and choice for government workers, especially around scenarios of accessibility, archiving and access to historical documents.

Governments choosing their path of involvement typically take one of the following paths:

1. standardize on a single format
2. create policies that accept multiple formats, such as ODF and Open XML
3. remain format neutral, enabling the entry of emerging standards over time, and simply creating principles around which document formats standards are acceptable

This paper presents the framework for multiple standards and neutral policies as an optimal long-term, cost conscious solution. Throughout the paper, we discuss factors in the decision and examples of various governments and policy makers, sampling today's policy landscape by country with examples of neutral and dual policy countries and lessons learned from single-standard adoption.

Mandating specific technology locks out innovation. Rather, neutral policies with respect to competing technologies and business/licensing models allow for choice of document formats based on the document tool best suited for a particular job.

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THE BENEFIT OF A NEUTRAL OR MULTIPLE-STANDARD POLICY

There are many benefits of a neutral or multiple-policy for document format standards and they can be categorized as: choice, interoperability, compatibility and innovation. Together, these benefits lead to the long-term durability of our global knowledge through documents.

Choice. It's important that governments, and the people they interact with, have the necessary choice in document formats to meet their specific needs today while supporting the life of the document for years to come.

Document interoperability and compatibility. Both open standards, Open XML and ODF, prioritize features that retain the integrity of data between applications and across versions of a particular product. This co-existence benefits customers around data fidelity, ease of use and productivity.

Innovation: Multiple standards also help foster greater innovation and consumer choice. It is quite common to have standards (including multiple ISO/IEC standards) whose scopes overlap, but that address distinct user requirements. Examples include digital media formats, wireless communication standards, and digital TV Formats. These points also apply in the case of Open XML and ODF standards. The fact that both are sanctioned by standards bodies validates their importance in the range of document formats.

A sophisticated standards ecosystem is set up to keep pace with changing technology and market. In the context of a sophisticated, well-established standards ecosystem in the IT industry, policy-makers can heartily rely on the standards process to keep pace with the ever-changing, volatile environment of technology and emerging standards.

There are several challenges incurred by adopting a single standard. Over the years, standards have changed and they will continue to change. Limiting document formats to a single standard increases the risk of document obsolescence. This is a critical factor in extending the life of a document, especially as it is used for historical purposes. Document integrity encompasses the preservation of content around billions of existing documents.

CHOICE

The overall benefit to governments adopting multiple standards is to allow government workers to choose the document standard that best fits each different business need while still providing for the perpetual availability of document data.

Governments that standardize on a single document format may be at risk. While the two standards may seem to meet the same needs at a high level, there are differences that are important to understand. These differences include the maturity of the standards and their ability to deliver interoperability between different implementations.

With ODF and Open XML, governments can adopt a wider-array of choices around accessibility, archiving and extensibility of applications available on each platform.

A paper published in the Stanford Law and Policy Review ¹ explains the benefits of a neutral government policy around technology standards and provides a framework by which policy makers can consider specific cases. The paper shows why government should be reluctant to intervene in the setting of information technology standards (and particularly to mandate a specific standard that has not been developed and/or widely adopted by the market). Reasons include:

- The relevant industries are sophisticated in regard to standards setting and have many well-developed types of standards, and forums in which to develop standards.
- The U.S. government has a strong preference for market-developed information technology standards and promotes this preference as a matter of both domestic law and policy and foreign trade policy.
- International trade agreements limit the degree to which participating governments can mandate standards.
- In contrast to the sophistication of the marketplace, government is rarely as informed or as sophisticated in its understanding of the market, or nimble enough to respond to market changes.

For these reasons and more, Microsoft supports and makes possible the use of multiple document formats in its software products in the form of Office Open XML, the default standard format for Microsoft Office (.docx, .xlsx, .pptx). It is important to point out that Open XML, Microsoft Office's default standard, is used across hundreds of applications including Office 2010. Many in the IT ecosystem have used Open XML to build business productivity applications and developer tools, making Open XML a mainstream standard.

INTEROPERABILITY

Interoperability is perhaps the most important attribute for today's technology decisions in both government and business.

Open XML can be implemented in an interoperable manner across multiple applications and multiple platforms.

Examples of Open XML interoperability in the marketplace today include:

- Apple's support of Open XML in their iWork desktop productivity suite, TextEdit for the OS-X operation system and iPhone platform, and the Microsoft Office for Mac product line.
- Support for Open XML on the Linux platform, in products from OpenOffice.org, IBM, Novell, Gnumeric, and many others.
- Open XML implementations on the Windows platform that provide sophisticated interoperability with Microsoft Office, including Corel WordPerfect Office X-4, Nuance's OmniPage, Datawatch's Monarch, Altova's XMLSpy, and many others.
- Cloud-based Open XML implementations including Google Docs, Zoho Writer, and Microsoft Office's Web Application Companion versions of Microsoft Word, Excel and PowerPoint®.

"Interoperability is a key priority of the government in the e-governance paradigm. Our ability to meet the needs of citizens will be greatly increased by the interoperability and integration of open, XML-based standards. It also empowers citizens to use the software of their choice. So, we are very pleased to see Microsoft take a responsible and open, yet practical, approach to our interoperability requirements."

M. Moni, deputy director general of the National Informatics Centre (Spearheading the process of e-government standards in India)

These implementations demonstrate the broad reach of Open XML, which has been successfully implemented by multiple vendors on multiple platforms. For users who need to collaborate with others in heterogeneous computing environments, Open XML is an excellent choice.

Open XML has seen broad adoption across multiple technology platforms and support by numerous vendors and organizations. Thousands of developers, organizations, governments, and professionals spanning 67 countries and six continents have already expressed public support for Open XML and for its approval by ISO/IEC. (See www.openXMLcommunity.com/community.aspx and <http://openXMLdeveloper.org/posts.aspx>)

Breaking Down Digital Barriers: When and How ICT Interoperability Drives Innovation.² This study, jointly conducted by The Berkman Center at Harvard Law School and the Research Center for Information Law at University of St. Gallen, demonstrates that private sector leadership, more so than government intervention, is the optimal method for ensuring that technologies work well together and innovation flourishes. Specific findings of the research are that:

- The *private* sector generally should lead interoperability efforts. The public sector should stand by either to lend a supportive hand or to determine if its involvement is warranted.
- Interoperability does not mean the same thing in every context. There is no universal method (such as imposing open standards) to achieve interoperability. Nor is interoperability always required.

- Interoperability can be achieved by multiple means. These include the licensing of intellectual property, product design, collaboration with partners, development of standards, and governmental action.
- Trying to impose universal answers can produce unintended harmful consequences. These can include curtailing innovation, limiting consumer choice, and reducing competition.
- The best path to interoperability depends greatly upon context and which subsidiary goals matter most. These goals can include prompting further innovation, providing consumer choice or ease of use, and the spurring of competition in the field (such as through multiple document formats).

The research can be downloaded at no charge at <http://cyber.law.harvard.edu/interop/>.

Recommendation for Governments and Policy Makers:

In order to maximize the level of interoperability, governments should embrace a policy that allows for choice by their software procurement and other divisions seeking interoperability solutions — choice as to which one of the above four pillars, or combination of them, is the best means of achieving interoperability in a given situation; choice regarding which open standard(s) and/or proprietary standard(s) to rely on under the circumstances; and choice between open source software and proprietary software in the procurement process. This flexible approach predicated on choice is particularly appropriate in the rapidly converging IT world, in which customers and governments increasingly rely on a combination of proprietary and open source software, as well as open standards and proprietary standards, to develop an ideal interoperability strategy.

“Your Documents, Your Choice: Open XML, A Policy Guide”³

In order for documents saved in different open standards to ensure that there is not a loss of data between the standards, they apply a prioritized formatting. For example, Open XML has prioritized support for features that may have an impact on document integrity as they integrate with other applications. Therefore, even if some features (such as the “Glow” font format featured in Word) demonstrate a minor loss of fidelity or may render differently in different implementations, the content itself is retained ensuring that governments, businesses, and citizens will not experience a loss of data.

As an example of the strong connections and high fidelity between OPEN XML and ODF and how they can co-exist, let’s create a document with them.



Above, document saved in Word as XML. Below, the same document saved in Word as an ODT file and opened in OpenOffice (which uses the ODF standard).



“Devoteam concludes that open standards are not a sufficient prerequisite in itself to achieve full interoperability between different office suites. Furthermore, Devoteam concludes that a decision on ODF as the sole format for exchange of editable document formats at the moment will neither provide the desired interoperability nor support the functional needs of all users.”

The Market for Office Software, August 2009 ⁴

Considerations around Interoperability:

Tracked Changes - The tracked-changes workflow is widely used in the collaboration process in a diverse set of domains, including contract development, legislative processes, marketing campaigns, technical writing, and many others. Whether private citizens or government employees, users need to be able to review together effectively and the underlying choice of a document format will often determine the level of accuracy and efficiency that can be delivered. Implementations may vary in their approach, but the document format standard itself provides a fixed set of capabilities that sets an upper limit on what is possible.

Open XML is the only document format choice available for those who need robust and comprehensive change tracking. The Open XML standard contains more than 100 pages of documentation for change tracking (Part 1, Section 17.1.13.5), including dozens of examples for implementers. This documentation covers how to track changes in tables, equations, numbering properties, and many other structural elements. For more information about the technical limitations of ODF's approach to change tracking, see: <http://blogs.msdn.com/dmahugh/archive/2009/05/13/tracked-changes.aspx>

In general, Devoteam finds that the ODF standard is not very specific around track changes or macros, which means that the suppliers implement the functionality in different ways, thereby giving rise to interoperability problems. So, when a government worker requires change tracking, their choice may be limited should an only-ODF solution be available. Therefore, for government users with high demands around track changes and revisions, we see a compelling need for choice around OPEN XML solutions.

*The Market for Office Software, August 2009*⁵

Accessibility - 650 million people in the world suffer from some form of disability, according to the World Health Organization.⁶ Open XML enables the creation of accessible documents because it allows flexibility in file creation and maximizes the information needed to work with assistive technology applications or devices (ATs). The Open XML standard provides elements needed to create a semantic representation of a file that ATs can use to “show” a document to users with disabilities. Open XML files also give new opportunities to reuse billions of files in binary formats in existing repositories.

As a truly international standard, Open XML supports multiple languages and scripts including robust support for assistive technologies utilized by those with disabilities. Accessible technology looks for certain elements in the XML markup to understand the semantics of the document.

Without Open XML, accessibility solutions would be highly limited with dramatically fewer solutions for:

- Vision & Hearing Difficulties and Impairments
- Dexterity and Mobility Difficulties and Impairments
- Language and Communication Difficulties and Impairments

Assistive Technology Available using OpenXML standards

Governments adopting OpenXML ensure that the following assistive features are readily available for people with impairments. The types of solutions available from third parties today include:

	ODF Availability	Open XML Availability
Alternative input devices and switches including alternative keyboards, electronic pointing devices, sip-and-puff systems, wands and sticks, joysticks and trackballs, which allow individuals to control their computers through means other than a standard keyboard or pointing device.	<i>Currently under early development in ODF</i>	✓
Braille embossers transfer computer generated text into embossed Braille output. Braille translation programs convert text scanned in or generated via standard word processing programs into Braille, which can be printed on the embosser.	<i>Required by OASIS. In early development in ODF.</i>	✓
Keyboard filters include typing aids, such as word prediction utilities and add-on spelling checkers. These products reduce the required number of keystrokes. Keyboard filters enable users to quickly access the letters they need and to avoid inadvertently selecting keys they don't want.	<i>None known for ODF.</i>	✓
Large-print word processors allow the user to view everything in large text without added screen enlargement.	<i>None known for ODF.</i>	✓
On-screen keyboards provide an image of a standard or modified keyboard on the computer screen. The user selects the keys with a mouse, touch screen, trackball, joystick, switch, or electronic pointing device.	✓	✓
Reading comprehension programs focus on establishing or improving reading skills through ready-made activities, stories, exercises, or games. These programs can help users practice letter sound recognition and can increase the understanding of words by adding graphics, sound, and possibly animation.	<i>None known for ODF.</i>	✓
Reading tools and learning disability programs include software designed to make text-based materials more accessible for people who struggle with reading. Options can include scanning, reformatting, navigating, or speaking text out loud. These programs help individuals who have difficulty seeing or manipulating conventional print materials; people who are developing new literacy skills or who are learning English as a foreign language; and people who comprehend better when they hear and see text highlighted simultaneously.	✓	✓
Refreshable Braille displays provide tactile output of information represented on the computer screen. The user reads the Braille letters with his or her fingers, and then, after a line is read, refreshes the display to read the next line.	✓	✓
Screen magnifiers work like a magnifying glass. They enlarge a portion of the screen as the user moves the focus—increasing legibility for some users.	✓	✓
Screen readers are software programs that present graphics and text as speech. A screen reader is used to verbalize, or “speak,” everything on the screen including names and descriptions of control buttons, menus, text, and punctuation.	✓	✓
Screen review utilities make on-screen information available as synthesized speech and pairs the speech with a visual representation of a word, for example, highlighting a word as it is spoken. Screen review utilities convert the text that appears on screen into a computer voice. This helps some people with language difficulties and impairments by giving them information visually and aurally at the same time.	✓	✓
Speech synthesizers or text-to-speech (TTS) systems, receive information going to the screen in the form of letters, numbers, and punctuation marks, and then “speak” it out loud. Using speech synthesizers allows blind users to review their input as they type.	✓	✓
Speech/voice recognition allows data entry by voice commands rather than a mouse or keyboard.	✓	✓
Talking word processors are software programs that use speech synthesizers to provide auditory feedback of what is typed.	<i>None known for ODF.</i>	✓
Touch screens allow direct selection or activation of the computer by touching the screen.	✓	✓
Word prediction programs allow the user to select a desired word from an on-screen list located in the prediction window. This helps individuals increase written productivity and accuracy, and increase vocabulary skills through word prompting.	<i>None known for ODF.</i>	✓

*Online research conducted by EMM, Inc. October 2010

Conclusion

Analysis compiled by Microsoft Corp
November 2010
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COMPATIBILITY

Technology is backward compatible if it can work with data generated by an older version. Forward compatibility means that old versions can receive, read, and view the newer versions. Compatibility is particularly important in the context of document retention and archiving.

Long-term Document Retention: Vast amounts of data are stored in the old binary formats which highlights the importance of maintaining the bridge back to that data for governments. Open XML's goal is to be "fully compatible with the existing corpus of Microsoft® Office documents." This goal was achieved in the final standard, as users today can readily convert existing documents from the previous proprietary binary formats to the standardized Open XML format without loss of document content, semantics or structure.

Open XML is the only format that addresses this goal, which is an important consideration for users and organizations with large investments in existing documents based on the .doc, .xls and .ppt formats. Open XML has been designed to be backward compatible with the content and functionality in those billions of existing documents. This long-term archival protection is one of the key reasons the open standard is supported by the U.S. Library of Congress and the British Library.

INNOVATION & ECONOMIC OPPORTUNITY

In considering economic opportunity, several countries have opted for different formats, including ODF, Open XML, PDF, and doc in various combinations. According to Devoteam: "There seems to be a tendency that ODF in some countries is preferred or given some form of preference, which appears to be based on a desire for more competition." Yet, the pursuit of competition can place unnatural restrictions on which competitors operate in a particular country.

Harvard Law's Berkman Center states: *"Trying to impose universal answers can produce unintended harmful consequences. These can include curtailing innovation, limiting consumer choice, and reducing competition."*⁷

Microsoft has centered its business on enabling developers. The daily workings of Microsoft's partner-based business model create nearly 15 million family-wage information technology (IT) jobs in communities around the world. That accounts for 42 percent of the global IT workforce (Microsoft Citizenship Report, 2010).

Additionally, the selection of a single specific standard may slow the economic situation in a country whereby, risk-averse consumers and businesses will delay or refrain from making technology purchases during periods of uncertainty regarding the choice of a future standard. This makes the policy of standards selection by government a lose-lose scenario from an economic standpoint.

Harvard Law's Berkman Center endorses technology and brand neutrality in standard selection: *"Trying to impose universal answers can produce unintended harmful consequences. These can include curtailing innovation, limiting consumer choice, and reducing competition."*⁸

Small software companies around the world work every day to add value, create jobs and stimulate their local economies through their work with the Open XML formats. There are many signs of the growing number of developer tools which have been created for the Open XML formats, the rapidly growing participation in the Open XML Developer Community Web site, www.OpenXMLDeveloper.org, and the heavy traffic on the Microsoft MSDN® Web site, where Open XML articles and videos have seen over 1.3 million downloads since January 2008. A hint of the size of the market these developers are serving can be found in the fact that the Microsoft Compatibility Pack, which allows users of earlier versions of Office to open, edit, and save Open XML documents, has now been downloaded more than 140 million times.

Open XML SDK for Microsoft Office

(<http://www.microsoft.com/downloads/en/details.aspx?displaylang=en&FamilyID=c6e744e5-36e9-45f5-8d8c-331df206e0d0>) provides developers seeking to build document processing solutions without the use of Microsoft Office applications thereby.

OPEN XML ADOPTION, SUPPORT & IMPLEMENTATIONS

We're platform agnostic, open, and available to any technology, but the drive is for Open XML. It represents the least risk, the highest reward, and the highest probability of hitting our delivery dates.
– Philip Lieberman, President, Lieberman Software Corporation, Los Angeles, USA

The value to governments that broadly support standards is that it indicates that the standard is meeting the demands of its users and gives users confidence that the legacies they build will be sustained in the long term by the community who adopts it.

Thousands of applications currently support Open XML. A Microsoft directory of Open XML support solutions and supporting products is available, using directories at: [Microsoft Solution Finder](https://solutionfinder.microsoft.com/Solutions/SolutionsDirectory.aspx?location=e0766ffbae1c4668a2e1826e6008cf94&keywords=%2522open%2bxml%2522) (<https://solutionfinder.microsoft.com/Solutions/SolutionsDirectory.aspx?location=e0766ffbae1c4668a2e1826e6008cf94&keywords=%2522open%2bxml%2522>) or [Microsoft Pinpoint Directory](http://pinpoint.microsoft.com/en-US/SelectCulture.aspx) (<http://pinpoint.microsoft.com/en-US/SelectCulture.aspx>). A community-managed list of Open XML supporting products is also available on Wikipedia: http://en.wikipedia.org/wiki/List_of_software_that_supports_Office_Open_XML.

Business Productivity Apps Supporting Open XML

Two studies point to Open XML's momentum. An independent study by the [Burton Group Report](#)^{iv9} predicts, on the basis of both functionality supported and a worldwide ecosystem of partners, that Open XML will be more successful and "more pervasive" than ODF. The report's examination of ODF's capabilities leads the authors to the conclusion that ODF is "insufficient for complex real-world enterprise requirements" and its use will be limited to scenarios where there are no requirements around complex document modeling. The report projects that Open XML will be widespread and swiftly fuelled by the global ecosystem currently supporting Microsoft Office applications, and that ODF evolution will be "slow and complex," largely due to the fact that OpenOffice.org, the primary implementation of ODF, is arguably still, in some respects, controlled by Sun Microsystems.¹⁰

A [recent study by IDC](#) ¹¹ of 200 U.S. and EU small and large, public and private organizations affirmed the significant adoption and momentum of the Open XML standard worldwide: “Open XML is clearly preferred in both public and private sectors in the United States and in Europe” (at page 11); “Open XML has created significantly more traction in the market than other XML-based standards such as ODF....” (at page 10); “Open XML is the standard showing the most progress over the next year [i.e., planned pilots and deployments].” More than 20 million compatibility packs that allow users of earlier versions of Microsoft Office to work with Open XML have been downloaded. The ODF-Open XML Translator has more than 400,000 downloads and has become one of the 25 most active projects on SourceForge.net, which hosts more than 100,000 open source projects.

For in-depth examples of Open XML implementation used around the world, see

[“Your Documents, Your Choice: Open XML” – A Policy Guide](#) ¹².

A SOPHISTICATED STANDARDS-SETTING ECOSYSTEM

The standard-setting process works hard for policy setters. In the wake of ever-changing technologies, the experts who define standards keep pace.

“The computing and software industries have a long and successful history. There are well-established, sophisticated mechanisms and means to develop information technology standards. There is also a well-developed body of law and public policy in the area, both the laws of the U.S., but also, those laws as representative of most of the developed world – laws and public policy that guide governments to prefer market-developed standards. Government should be reluctant to mandate an IT standard.”

-Stacy Baird, Managing Director, Citrus Co

Standards have been relied on for decades to create a system and have proven dependable and adaptable to foster simplicity, integration, and reliability. Standards are created by bringing together experienced parties from points all along the value chain. Participants work together to publish specifications that enhance interoperability which is best achieved through a balanced approach of standards, products, community, and access to intellectual property.

Policies, on the other hand, are intended to establish and emphasize the desired outcome that embodies the greater public good. They emphasize principles and rely on standards as a reference for compliance if compliance to a policy is mandated.

Compared to the market’s sophistication, government is seldom as advanced in its understanding of the market, so through decades of history, governments have generally come to trust in the standards process to keep pace with the changes in a particular industry.

Therefore, governments have generally remained neutral or allowed multiple-standards that meet the *principles* and goals of its territory without calling out a particular platform individually.

A policy of “open formats” would include both ODF and Open XML, but would not specify one or the other.

THE OPEN XML STANDARD

Open XML was originally a collaborative effort between a dozen global organizations in Ecma International. It was subject to intense expert scrutiny and during this scrutiny the original 2,000 pages grew to 6,000 to cover the practical details needed to ensure interoperability between independent implementations, and to ensure backwards compatibility with billions of existing documents. During its subsequent passage through ISO/IEC JTC1 it has received the further scrutiny of JTC1 experts and further improvements to the standard. Finally, after input from over 86 national bodies, Open XML was ratified by ISO in 2008 as ISO/IEC 29500.

The participants in Ecma who contributed to the creation of ECMA-376 were: Apple, Barclays Capital, British Petroleum, The British Library, Canon, Essilor, HP, Intel, Microsoft, NextPage, Novell, Statoil, Toshiba, Unisys, and the United States Library of Congress.

Attributes of an Open Standard

Open XML is a ratified standard that complies with the inherent attributes of “open format” standard which is periodically reviewed by governments. Several of these attributes, including the standard’s openness and implement-ability, will be examined.

Documentation: Open XML is among the most thoroughly documented document file format standard in existence today. Since Office Open XML is fully-documented and publicly available, this means that anyone can freely access the documentation and implement the standard. The following links are the *free* download sites for Office Open XML documentation:

- Free download as [ECMA-376](http://www.ecma-international.org/publications/standards/Ecma-376.htm) 2nd edition which is technically aligned with ISO/IEC 29500:2008 (<http://www.ecma-international.org/publications/standards/Ecma-376.htm>).
- Free download as [ISO 29500](http://standards.iso.org/ittf/PubliclyAvailableStandards/index.html) which can be obtained by title as follows (<http://standards.iso.org/ittf/PubliclyAvailableStandards/index.html>):

Additionally, MSDN maintains tens of thousands of articles that can be queried for supporting implementation such as one which describes a [step-by-step process](#) (using tables as an example) that can be used to create and modify Open XML documents. Microsoft also actively participates and documents open engagements in the developer community with live, ever-growing resources such as: [Open XML Developer web site](#), [MSDN Office Developer Center](#), and [Microsoft Office Open XML SDK](#)

The breadth of features and the size of the community developing for Office Open XML are substantial. Therefore, adequate detail and quality of Open XML reference documentation has been maintained by Microsoft. And, ISO standards such as Open XML are maintained via an open and transparent process as defined in the JTC 1 Directives. Key decisions and updates are made publicly available, and in the case of ISO/IEC 29500 the maintenance process can be followed by the public through the [SC34 web site](http://www.itscj.ipsj.or.jp/sc34/) (<http://www.itscj.ipsj.or.jp/sc34/>).

Community-Maintained: The Open XML standard is maintained by ISO/IEC JTC 1 SC34, whose members include more than 30 national bodies and liaison organizations such as Ecma International, the original creators of the ECMA-376 Office Open XML standard, and the XML Guild. Proposed changes to the Open XML standard are reviewed and formalized by a diverse group including active participants from many countries, and more than 100 member countries of ISO/IEC vote on any proposed amendments to the standard.

Every country has a voice in the future of Open XML, making it a great choice for all.

Freely-Implementable: Any required Microsoft patent rights are available on a royalty-free, perpetual basis to all implementers.

Through Microsoft's Interoperability Principles, Microsoft has made legal commitments to Ecma International, to ISO/IEC, and to all interested users and vendors that anyone can use and implement Open XML without Intellectual Property Rights (IPR) burdens. Microsoft believes that it is in everyone's interest for this open file format to be available freely and easily for document exchange and preservation.

When Microsoft submitted and turned over control of Open XML to the international standardization process, Microsoft also provided multiple options to ensure that its essential patents can be used by anyone, including OSS developers. These IPR commitments go beyond the requirements for ISO/IEC adoption of a standard, and ISO/IEC and Ecma have stated specifically that there are no IPR issues with Open XML.

Both ISO/IEC and Ecma have publicly declared that no intellectual property rights issues exist.

"IPR decisions have previously been delegated by all the ISO/IEC and IEC members (NBs) to the CEOs of IEC and ISO/IEC, and they in turn have examined them and found no outstanding problems."

Microsoft Open Specifications Promise & Covenant Not to Sue:

Citizens and governments continue to be protected under Microsoft's 2008 commitment to the Open Specification Promise:

www.microsoft.com/interop/osp/. The OSP is an example of a covenant not to sue (CNS) which covers any use and implementations of an appended list of covered specifications to the extent that they conform to those specifications. This allows for conformance to be partial and does not require the conformance to be perfect.

Key Aspects of Microsoft's OSP

- Any required Microsoft patent rights are freely available to all developers and customers of Open XML in either open source software or proprietary software.
- By stating that the covenant is "irrevocable," Microsoft has assured users that there will not be a change in company policy at any point in the future.
- Vendors, distributors, and users of Open XML implementations benefit from the OSP just like implementers do. Consequently, there is no need for implementers to pass the promise on to others in their distribution channel, as it is always available to everyone directly.
- No one needs to sign anything or even reference Microsoft to take advantage of the OSP.
- This form of patent non-assert enables open source software implementations. It is especially convenient for open source software developers as there is no issue as to whether or not the IP is sub-licensable.
- The OSP applies whether a party has a full or partial implementation. Parties get the same irrevocable promise from Microsoft either way.

Since Microsoft introduced the covenant not to sue, open source developers have been freely able to develop both for *non-commercial* implementations using the documentation to develop their products; and for *commercial* distribution by obtaining a patent license from Microsoft.

Patent Pledge for Open Source Developers

"Anyone is free to implement the specification(s), as they wish and do not need to make any mention of or reference to Microsoft. Anyone can use or implement these specification(s) with their technology, code, solution, etc. You must agree to the terms in order to benefit from the promise; however, you do not need to sign a license agreement, or otherwise communicate your agreement to Microsoft".

Microsoft irrevocably promises not to assert any Microsoft Necessary Claims against you as an open source software developer ("You") for making, using, importing, or distributing any implementation of a Covered Specification ("Covered Implementation"), subject to the following. This is a personal promise directly from Microsoft to You, and You acknowledge it is a condition of benefiting from it that no Microsoft rights are received from suppliers, distributors, or otherwise by any other person in connection with this promise."

CHALLENGES WITH SINGLE FORMAT POLICIES

Open innovation and the ever-evolving mix of business models pursued by competing companies highlight how dynamic the IT environment is and how marketplace forces are driving greater competition and innovation.

Should governments leave room for other emerging document standards? Policy makers have taken note of the risk of billions of dollars spent mandating standards as Japan did in the HDTV context.

For this reason, in 1996, when the U.S. Federal Communications Commission (FCC) adopted a digital broadcast standard, it declined to mandate a single video format based on the conclusion that it would "result in greater choice and diversity of equipment, allow computer equipment and software firms more opportunity to compete by promoting interoperability, and result in greater consumer benefits by allowing an increase in the availability of new products and services." Further, the FCC concluded that "allow[ing] video formats to be tested and decided by the market [would] avoid[] the risk of a mistaken government intervention in the market."

Cost Considerations: Not only is choice good public policy, it is also cost-effective. It encourages companies to vigorously compete for the government's purchase decision, in turn, ensuring the efficient expenditure of public funds. Additionally, selecting a single standard may mean workers need to learn new software in order to view and use the chosen format. There may be lost productivity and additional costs in having to train or convert existing knowledge worker platforms.

In 2009, The Competition Authority, on the basis of decisions in the Danish Parliament was tasked to investigate the competition in the market for office software. Since particular technical analysis and assessment is outside the normal competence of the Competition Authority, the authority subcontracted assessments of interoperability, technical and legal bindings from a consultancy firm, Devoteam Consulting. The main conclusions of Devoteam analysis are referenced throughout this paper.

*"Consumers will often be reluctant to change office suites because a change, to a certain extent, will entail costs for training and learning in the short term."*¹³

When governments select only one standard, it can have great cost consequences that are spread throughout an organization. This example, from the State of Texas, offers an excellent analysis of the potential costs of standardizing on ODF. After completing the full analysis, the bill to convert to ODF was rejected.

State of Texas Case Study

In the U.S., the State of Texas rejected a bill to convert to ODF based on cost estimates to implement the provisions of the bill which included five major factors:

1. Training agency staff on the new software
2. Converting current files, including word-processed documents and spreadsheets
3. Reprogramming needs of affected agencies' applications
4. Increased storage needs for XML documents, which are typically larger in size than current word-processed and spreadsheet documents
5. On-going technical support for open source software

It is estimated that 169,700 full-time equivalents (FTEs), or 75 percent of 226,267 state employees, would need training on the open source software at an average cost of \$300 per FTE for a total of \$50,910,000 in fiscal year 2008. The cost of \$300 per FTE is based on the average estimated cost of training per FTE received from state agencies.

The cost of converting, testing, and modifying agencies' applications to the XML format is estimated to take an average of 1.25 hours for each of the 169,700 FTEs at a cost of \$75 per hour, for a total of \$15,909,375 in fiscal year 2009. It is assumed that all files that fall under the DIR guidelines will be converted in fiscal year 2009. The average number of hours to convert, test, and modify agencies' applications is based on the average response received by agencies. The cost of converting documents in 2009 could be higher or lower depending on the guidelines DIR develops.

It is estimated that the additional storage needs for storing the larger files is \$60 for each of the 169,700 FTEs for a total of \$10,182,000 in fiscal year 2008. The average cost for storage is based on the average response received by agencies.¹⁵

International Chamber of Commerce

"ICC opposes government procurement preferences and mandates that favor one form of software development or licensing over others. Governments, like all potential and existing customers, should choose software on a technology-neutral and vendor-neutral basis, examining the merits of the technology based upon the performance factors stated above. As a general rule, governments should not discriminate against or ban the procurement of software based on its licensing or development model. Such preferential policies prevent public authorities from effectively weighing all relevant factors in their procurement decisions.'" ¹⁴

Productivity

All organizations, from private businesses to the public sector, are under pressure not only to reduce costs but to streamline processes and increase productivity. Open XML offers unique productivity features not available in any other international document format standard. Examples include: full spreadsheet support, flexible mail-merge functionality, dynamic diagramming capabilities, and robust change tracking capabilities

The presence of these types of functionality in the Open XML format allows users to productively focus on the creative task at hand, without spending time on the sorts of manual workarounds needed when such capabilities are missing from a document format.

Open XML further expands the opportunities for productive collaboration through its broad support for internationalization features required by such diverse languages as Arabic, Chinese (three variants), Hebrew, Hindi, Japanese, Korean, Russian, and Turkish. Open XML has a rich set of internationalization features which have been refined over the course of many years, such as text orientation, text flow, number representation, date representation, formulas, and language identifiers.

Standards Volatility

Standards can change over time. New standards can be added and older standards dropped. Using a single standard puts governments at risk if that standard changes in ways that limit compatibility or interoperability.

A notable example of the potential dangers of government-mandated technologies occurred in the high definition television (HDTV) area. Japan spent 20 years of effort and billions of dollars on a government-mandated, analog-based HDTV standard — called “Hi-Vision” — only to end up being quickly surpassed in the race toward HDTV by America, whose casual, market-based approach to innovation allowed a tiny American company — General Instrument — to develop a digital-based HDTV standard that became the cornerstone of the global digital technology revolution. In short, the digital revolution was born and first flourished in the U.S. precisely because there was no government-directed program seeking a preferred technological outcome for HDTV.

Although both ODF and Open XML are document formats, they are designed to address different needs in the marketplace. These are just two of the many formats in use today, including PDF/A and HTML, which are already accepted as ISO standards and supported by Office.

One can see a similar dynamic in the case of digital image formats, such as CGM, JPEG, and PNG, each of which is an ISO standard and meets different needs in the marketplace.

Once a standard has become widespread, most consumers and businesses tend to rally around the standard until terminated by a technological quantum leap that makes the widespread standard obsolete. Therefore, it is expensive to make the wrong choice. When several standards are fighting for dominance for a longer or shorter period, it may entail substantial costs and wrong investments for consumers and companies, should they choose a losing standard that is later obsolete.

2007 United Nations Report on e-Government

“The rigid insistence of using any particular standard may constrain a government from using old standards that respond to all previous needs as well as to new ones. Mandating a particular technology will not only prevent government from using the latest and the best but also consign it to using older and perhaps outmoded standards.”¹⁶

CURRENT DOCUMENT STANDARDS LANDSCAPE, BY COUNTRY

The following is the current state of various country and state policies as of November 2010.

It is notable that the majority of countries have taken a neutral or dual-policy approach to document formats stating that, while they support “open formats” (a category in which both ODF and Open XML fall), they do not go so far as to specify a single platform as a mandated standard.

Document Standards by Country, Neutral or dual-standard policies

Nov 2010

Argentina: Varies regionally between PDF, ODF or OPEN XML

Croatia: Open to multiple standards

Denmark: 2007 broad-ranging national agreement embraces both Open XML and ODF

Germany: Allows technology-neutral advancements of standards

India: ODF and other document formats

Italy: Repeatedly rejects preferences in open document formats

Japan: Urges consideration of multiple standards in procurement decisions

Korea: Makes ODF optional

Malaysia: Refuses to mandate a document format standard

Netherlands: Multiple document formats can coexist

Norway: Chooses an open-minded preference for optional standards

Poland: Requires neutrality and prohibits preferences in technical procurement decisions

Russia: Supports “widely-used standards”

South Africa: ODF, ASCII, CSV (OPEN XML allowed)

Sweden: Official inquiry considered but rejected ODF preference

Switzerland: Standards group includes Open XML and ODF in policy

Uruguay: ODF, PDF

USA:

Massachusetts – Added Open XML in 2007

Texas—Single ODF standard proposal rejected. ODF too expensive to implement

Minnesota – Neutral policy

Oregon – ODF is too expensive to implement

OTHERS – Have declined to mandate document formats

For updated lists, see: http://en.wikipedia.org/wiki/Office_Open_XML and http://en.wikipedia.org/wiki/OpenDocument_adoption.

Government Best Practice, State of Minnesota Analysis and Report

[Preserving the Present: Creating, accessing and maintaining Minnesota's electronic documents](http://www.microsoft.com/downloads/en/details.aspx?FamilyId=AD0B72FB-4A1D-4C52-BDB5-7DD7E816D046&displaylang=en)

(<http://www.microsoft.com/downloads/en/details.aspx?FamilyId=AD0B72FB-4A1D-4C52-BDB5-7DD7E816D046&displaylang=en>)

...This report does not recommend the adoption of a particular format standard. The dynamic nature of technology innovation and change make adoption of a single standard problematic. Moving in the direction of a fully documented functional document standard that can do all one wants is desirable. But neither of the competing standards proposed addresses all the government goals and purposes in the law. In any case, the choice or use of a standard must not be to adopt a standard for the sake of adopting a standard. Any choice must be in the context of what value such a decision adds to government.

The report identifies several concrete, practical steps that the state can take to address electronic records policy issues so that actions taken support the best interests of the state for responsible stewardship of information resources, including working with other states and stakeholders to seek collaborative approaches to common problems in government electronic records management.

CONCLUSION

Both Open XML and ODF are considered open document standards and both are recognized by global standards bodies as such. The decision for policymakers to adopt a neutral or dual-policy for any open document standard generally revolves around principles of choice, interoperability, compatibility, and innovation.

Choice. With multiple open standards available to them, people will have the choice that will meet their specific needs today while supporting the life of documents for years to come.

Interoperability and compatibility. Certain scenarios are particularly dependent on interoperability. One such scenario is accessibility where a single standard choice would limit the functionality available. Another scenario is document archival, where the preservation of data included in billions of existing documents makes long-term compatibility a key consideration. Dual standards are able to co-exist by their ability to prioritize data fidelity when storing documents. The founding of Open XML was rooted in the need for document archival and has been built and supported by the likes of the Library of Congress and British Library.

Innovation and adoption. Multiple standards help foster greater innovation and consumer choice. It's important to monitor world-wide adoption and support of standards as they may change over time. Adoption and momentum is a key indicator of market value and Open XML has been part of the largest wave of innovation and adoption in the world. The future of any standard is dependent on its acceptance first by standards bodies, such as the Ecma and ISO/IEC, and also by users, corporations, governments, and software developers. The wider the acceptance and use of the standard, the greater its likelihood to be long-lived. Developer support for Open XML has been proven as a healthy, open platform upon which to build productivity solutions and develop tools.

A sophisticated standards ecosystem is well-established in the IT industry and designed to keep pace with changing technology and market. In this context, policy makers can heartily rely on the standards process to keep pace with the ever-changing, volatile environment of technology and emerging standards without locking into a single standard. As standards change over time, this ecosystem they will continue to adapt more quickly than policies are able to adapt.

Different users and organizations may have different needs, and those needs may be best served by any one of the many document formats available today, including ISO/IEC standards such as Open XML, ODF and PDF, as well as HTML and other formats. The best choice for most organizations is not a single "one size fits all" document format, but rather a carefully considered list of options that is based on the requirements of users, developers, IT administrators, archivists, and policy makers. Open XML is an open standard that, given a neutral or multiple-standards policy, can continue to offer a broad set of features and benefits to governments and citizens.

"-both standards are seen as open standards." ¹⁷

[end paper]

FOOTNOTES

¹ Stanford Law and Policy Review: *The Government at the Standards Bazaar*, Volume 18, Issue 1, 2007

² Berkman Center for Internet & Society at Harvard Law School: *Breaking Down Digital Barriers*, 2005
<http://cyber.law.harvard.edu/interop/>

³ Microsoft: *Your Documents, Your Choice: Open XML, A Policy Guide*, 2008
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⁴ Danish Competition Authority: *The Market for Office Software – Competition and the importance of open standards, competition analysis*, 03/2009
The Competition Authority was, on the basis of decisions in the Folketing (The Danish Parliament), tasked to investigate the competition in the market for office software. Since particular technical analysis and assessment is outside the normal competence of the Competition Authority, the authority subcontracted assessments of interoperability, technical and legal bindings from a consultancy firm, Devoteam Consulting. The main conclusions of Devoteam analysis are described in this paper.
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<http://www.konkurrencestyrelsen.dk/index.php?id=28766>

⁵ Danish Competition Authority: **The Market for Office Software – Competition and the importance of open standards, competition analysis**, 03/2009
<http://www.konkurrencestyrelsen.dk/index.php?id=28766>

³ The Market for Office Software, August 2009 (unofficial translation)
Analysen er udarbejdet af Konkurrencestyrelsen
The Competition Authority has on the basis of decisions in the Folketing (The Danish Parliament) been tasked to investigate the competition in the market for office software. Since particular technical analysis and assessment is outside the normal competence of the Competition Authority, the authority has subcontracted assessments of interoperability, technical and legal bindings from a consultancy firm, Devoteam Consulting). The main conclusions of Devoteam analysis are described in this paper.
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⁶ World Health Organization. "Disability and Rehabilitation." Accessed October 2010.
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⁷ Berkman Center for Internet & Society at Harvard Law School: *Breaking Down Digital Barriers*, 2005
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⁸ Berkman Center for Internet & Society at Harvard Law School: *Breaking Down Digital Barriers*, 2005
<http://cyber.law.harvard.edu/interop/>

⁹ Guy Creese and Peter O'Kelly, Burton Group: *What's Up, .DOC? ODF, Open XML, and the Revolutionary Implications of XML in Productivity Applications*
<http://www.burtongroup.com/Guest/Ccs/WhatsUpDoc.aspx>

¹⁰ Guy Creese and Peter O'Kelly, Burton Group. "What's Up, .DOC? ODF, Open XML, and the Revolutionary Implications of XML in Productivity Applications." [HTTP://WWW.BURTONGROUP.COM/GUEST/CCS/WHATSUPDOC.ASPX](http://www.burtongroup.com/Guest/CCS/WHATSUPDOC.ASPX)

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¹³ Danish Competition Authority: **The Market for Office Software** – *Competition and the importance of open standards, competition analysis*, 03/2009
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