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Office Open XML - Wikipedia

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Office Open XML (also informally known as **OOXML** or **Microsoft Open XML** (MOX)^[2]) is a [zipped](#), [XML](#)-based [file format](#) developed by [Microsoft](#)^[3] for representing [spreadsheets](#), [charts](#), [presentations](#) and [word processing](#) documents. The format was initially standardised by [Ecma](#) (as ECMA-376), and by the [ISO](#) and [IEC](#) (as ISO/IEC 29500) in later versions.

Starting with [Microsoft Office 2007](#), the Office Open XML file formats have become the default^[4] target file format of [Microsoft Office](#).^{[5][6]} [Microsoft Office 2010](#) provides read support for ECMA-376, read/write support for ISO/IEC 29500 Transitional, and read support for ISO/IEC 29500 Strict.^[7] [Microsoft Office 2013](#) and [Microsoft Office 2016](#) additionally support both reading and writing of ISO/IEC 29500 Strict.^[8]

Background^[edit]

In 2000, Microsoft released an initial version of an [XML](#)-based format for Microsoft Excel, which was incorporated in Office

XP. In 2002, a new file format for Microsoft Word followed.^[9] The Excel and Word formats—known as the [Microsoft Office XML formats](#)—were later incorporated into the 2003 release of Microsoft Office.

Microsoft announced in November 2005 that it would co-sponsor standardization of the new version of their XML-based formats through [Ecma International](#) as "Office Open XML".^{[10][11]} The presentation was made to Ecma by Microsoft's [Jean Paoli](#) and Isabelle Valet-Harper.^{[12][13]}

Standardization process^[edit]

Microsoft submitted initial material to [Ecma International](#) Technical Committee TC45, where it was standardized to become ECMA-376, approved in December 2006.^[14]

This standard was then fast-tracked in the [Joint Technical Committee 1](#) of ISO and IEC. After initially [failing to pass](#), an amended version of the format received the necessary votes for approval as an ISO/IEC Standard as the result of a [JTC 1](#) fast-tracking standardization process that concluded in April 2008.^[15] The resulting four-part International Standard (designated ISO/IEC 29500:2008) was published in November 2008^[16] and can be downloaded from the [ITTF](#).^[17] A technically equivalent set of texts is published by Ecma as *ECMA-376 Office Open XML File Formats — 2nd edition* (December 2008); they can be downloaded from their web site.^[18]

The ISO standardization of Office Open XML was controversial and embittered,^[19] with much discussion both about the specification and about the standardization process.^[20] According to *InfoWorld*:

OOXML was opposed by many on grounds it was unneeded, as software makers could use [OpenDocument Format](#) (ODF), a less complicated office software format that was already an international standard.^[19]

— *InfoWorld*

The same *InfoWorld* article reported that [IBM](#) (which supports the [ODF](#) format) threatened to leave standards bodies that it said allow dominant corporations like Microsoft to wield undue influence. The article further says that Microsoft was accused of co-opting the standardization process by leaning on countries to ensure that it got enough votes at the ISO for Office Open XML to pass, although it does not specify exactly who accused Microsoft.^[19]

[Richard Stallman](#) of the [Free Software Foundation](#) has stated that "Microsoft offers a gratis patent license for OOXML on terms which do not allow [free](#) implementations."^[21]

Licensing^[edit]

Under the Ecma International code of conduct in patent matters,^[22] participating and approving member organisations of ECMA are required to make available their patent rights on

a [reasonable and non-discriminatory](#) (RAND) basis.

Holders of patents which concern ISO/IEC International Standards may agree to a standardized license governing the terms under which such patents may be licensed, in accord with the [ISO/IEC/ITU](#) common patent policy.^[23]

Microsoft, the main contributor to the standard, provided a covenant not to sue^[24] for its patent licensing. The covenant received a mixed reception, with some like the [Groklaw blog](#) criticizing it,^[25] and others such as [Lawrence Rosen](#), (an attorney and lecturer at [Stanford Law School](#)), endorsing it.^[26]

Microsoft has added the format to their [Open Specification Promise](#)^[27] in which

Microsoft irrevocably promises not to assert any Microsoft Necessary Claims against you for making, using, selling, offering for sale, importing or distributing any implementation to the extent it conforms to a Covered Specification [...]

This is limited to applications which do not deviate from the ISO/IEC 29500:2008 or Ecma-376 standard and to parties that do not "file, maintain or voluntarily participate in a patent infringement lawsuit against a Microsoft implementation of such Covered Specification".^{[28][29]} The Open Specification Promise was included in documents submitted to ISO/IEC in support of the ECMA-376 fast-track submission.^[30] Ecma International asserted that, "The OSP enables both open source and commercial software to implement [the

specification]".^[31]

Versions^[edit]

The Office Open XML specification exists in a number of versions.

ECMA-376 1st edition (2006)^[edit]

The ECMA standard is structured in five parts to meet the needs of different audiences.^[18]

Part 1. Fundamentals

- Vocabulary, notational conventions and abbreviations
- Summary of primary and supporting markup languages
- Conformance conditions and interoperability guidelines
- Constraints within the Open Packaging Conventions that apply to each document type

Part 2. Open Packaging Conventions

- The [Open Packaging Conventions](#) (OPC), for the package model and physical package, is defined and used by various document types in various applications from multiple vendors.
- It defines core properties, thumbnails, digital signatures, and authorizations & encryption capabilities for parts or all of the contents in the package.

- XML schemas for the OPC are declared as XML Schema Definitions (XSD) and (non-normatively) using [RELAX NG](#) (ISO/IEC 19757-2)

Part 3. Primer

- Informative (non-normative) introduction to WordprocessingML, SpreadsheetML, PresentationML, DrawingML, VML and Shared MLs, providing context and illustrating elements through examples and diagrams
- Describes the custom XML data-storing facility within a package to support integration with business data

Part 4. Markup Language Reference

- Contains the reference material for WordprocessingML, SpreadsheetML, PresentationML, DrawingML, Shared MLs and Custom XML Schema, defining every element and attribute including the element hierarchy (parent/child relationships)
- XML schemas for the markup languages are declared as XSD and (non-normatively) using RELAX NG
- Defines the custom XML data-storing facility

Part 5. Markup Compatibility and Extensibility

- Describes extension facilities of OpenXML documents and specifies elements & attributes through which applications can operate across different extensions.

Later versions of the ECMA-376 standard are aligned and

technically equivalent to the corresponding ISO standard.

ISO/IEC 29500:2008[\[edit\]](#)

The ISO/IEC standard is structured into four parts:[\[32\]](#) Parts 1, 2 and 3 are independent standards; for example, Part 2, specifying [Open Packaging Conventions](#), is used by other file formats including [XPS](#) and [Design Web Format](#). Part 4 is to be read as a modification to Part 1, which it requires.

A technically equivalent set of texts is also published by Ecma as ECMA-376 2nd edition (2008).

Part 1. Fundamentals & Markup Language Reference

Consisting of 5560 pages, this part contains:

- Conformance definitions
- Reference material for the XML document markup languages defined by the Standard
- XML schemas for the document markup languages declared using [XSD](#) and (non-normatively) [RELAX NG](#)
- Defines the foreign markup facilities

Part 2. Open Packaging Conventions

Consisting of 129 pages, this part contains:

- A description of the Open Packaging Conventions (package model, physical package)
- Core properties, [thumbnails](#) and [digital signatures](#)
- XML schemas for the OPC are declared using [XSD](#) and

(non-normatively) [RELAX NG](#)

Part 3. Markup Compatibility and Extensibility

Consisting of 40 pages, this part contains:

- A description of *extensions*: elements & attributes which define mechanisms allowing applications to specify alternative means of negotiating content
- Extensibility rules are expressed using [NVDL](#)

Part 4. Transitional Migration Features

Consisting of 1464 pages, this part contains:

- Legacy material such as compatibility settings and the graphics markup language VML
- A list of syntactic differences between this text and ECMA-376 1st Edition

The standard specifies two levels of document & application conformance, *strict* and *transitional*, for each of WordprocessingML, PresentationML and SpreadsheetML, and also specifies applications' descriptions of *base* and *full*.

Compatibility between versions[\[edit\]](#)

The intent of the changes from ECMA-376 1st Edition to ISO/IEC 29500:2008 was that a valid ECMA-376 document would also be a valid ISO 29500 Transitional document;[\[33\]](#) however, at least one change introduced at the BRM—refusing to allow further values for `xsd:boolean`—had the effect of

breaking backwards-compatibility for most documents.^[34] A fix for this had been suggested to [ISO/IEC JTC1/SC34/WG4](#), and was approved in June 2009 as a recommendation for the first revision to Office Open XML.^[35]

Applications capable of reading documents compliant to ECMA-376 Edition 1 would regard ISO/IEC 29500-4 Transitional documents containing ISO 8601 dates as corrupt.^[36]

Application support^[edit]

Some older versions of Microsoft Word and Microsoft Office are able to read and write .docx files after installation of the free compatibility pack provided by Microsoft,^[37] although some items, such as equations, are converted into images that cannot be edited.^[38]

Starting with [Microsoft Office 2007](#), the Office Open XML file formats have become the default file format^[4] of [Microsoft Office](#).^{[5][6]} However, due to the changes introduced in the Office Open XML standard, Office 2007 is not wholly in compliance with ISO/IEC 29500:2008.^[39] [Office 2010](#) includes support for the ISO/IEC 29500:2008-compliant version of Office Open XML, but it can only save documents conforming to the *transitional*, not the *strict*, schemas of the specification.^{[40][41]} Note that the intent of the ISO/IEC is to allow the removal of the transitional variant from the ISO/IEC 29500

standard.^[41]

The ability to read and write Office Open XML format is, however, not limited to Microsoft Office; other office products are also able to read & write this format:

- [SoftMaker Office 2010](#) is able to read and write DOCX and XLSX files in its word processor & spreadsheet applications.
- [LibreOffice](#) is able to open and save Office Open XML files.^[42]
- [OpenOffice.org](#) and [Apache OpenOffice](#) from version 3.0 has been able to import Office Open XML files, but not save them.^[43] Version 3.2 improved this feature with read support even for password-protected Office Open XML files.^{[44][45][46]}
- The [Go-oo](#) fork of OpenOffice could also write OOXML files.
- [KOffice](#) from version 2.2 and later was able to import OOXML files.
- [Calligra Suite](#) is able to import Office Open XML files.
- [NeoOffice](#), an OpenOffice.org fork for OS X is able to import but not save OOXML.

Other office products that offer import support for the Office Open XML formats include:

- [TextEdit](#) (included with [OS X](#))
- [iWork](#)
- [IBM Lotus Notes](#)
- [Abiword](#)

- [WordPerfect](#)
- [Kingsoft Office](#)
- [Google Docs](#)
- SoftMaker FreeOffice

See also[\[edit\]](#)

- [OOXML technical specification](#)
- [Standardization of Office Open XML](#)
- [Microsoft Word and Excel password protection](#)
- [Open Document Format \(ODF\)](#)
- [List of document markup languages](#)
- [Comparison of document markup languages](#)

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Further reading[\[edit\]](#)

External links[\[edit\]](#)



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