

Comparison of e-book formats

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The following is a **comparison of e-book formats** used to create and publish [e-books](#).

A writer or publisher has many options when it comes to choosing a [format](#) for publication. While the average end-user might arguably simply want to read books, every format has its proponents. The myriad e-book formats are sometimes collectively referred to as the "Tower of eBabel".^[1]

The storage size for texts without images depends on the file format, but is always relatively small compared with a richly illustrated text.

[\[edit\]](#) Format descriptions

Formats available include, but are by no means limited to:

[\[edit\]](#) Plain text files

Format: text

Published as: .txt

E-books in [plain text](#) exist. The size in bytes is simply the number of characters, including spaces, and with a new line counting for 1 or 2. For example, the [Bible](#), an 800,000-word book, is about 4 MB.^[2] The ASCII standard allows ASCII-only text files (unlike most other file types) to be interchanged and readable on Unix, Macintosh, Microsoft Windows, DOS, and other systems. These differ in their preferred line ending convention and their interpretation of values outside the ASCII range (their character encoding). Conversion of files from one to another line-ending convention is easily possible with free software on most computers.

[\[edit\]](#) Hypertext Markup Language

Format: Hypertext

Published as: .htm; .html

[HTML](#) is the [markup language](#) used for most [web](#) pages. E-books using HTML can be read using a [Web browser](#). The specifications for the format are available without charge from the [W3C](#).

HTML adds specially marked meta-elements to otherwise plain text encoded using [character sets](#) like [ASCII](#) or [UTF-8](#). As such, suitably formatted files can be, and sometimes are, generated *by hand* using a [plain text editor](#) or [programmer's editor](#). Many *HTML generator* applications exist to ease this process and often require less intricate knowledge of the format details involved.

HTML on its own is not a particularly efficient format to store information in, requiring more storage space for a given work than many other formats. However, several e-Book formats including the Amazon Kindle, Open eBook, Compressed HM, Mobipocket and EPUB store each

book chapter in HTML format, then use [ZIP](#) compression to compress the HTML data, images, metadata and style sheets into a single, significantly smaller, file.

HTML files encompass a wide range of standards^[3] and displaying HTML files correctly can be complicated. Additionally many of the features supported, such as forms, are not relevant to e-books.

[\[edit\]](#) Amazon Kindle

Format: Kindle

Published as: .azw

With the launch of the [Kindle](#) eBook reader, [Amazon.com](#) created the proprietary format, AZW. It is based on the [Mobipocket](#) standard, with a slightly different serial number scheme (it uses an [asterisk](#) instead of a [dollar sign](#)) and its own [DRM](#) formatting. Because the eBooks bought on the Kindle are delivered over its wireless system called Whispernet, the user does not see the AZW files during the download process. The Kindle format is now available on a variety of platforms.

[\[edit\]](#) Open Electronic Package

Format: Open eBook

Published as: .opf

[OPF](#) is an [XML](#)-based e-book format created by E-Book Systems.

[\[edit\]](#) TomeRaider

Format: TomeRaider

Published as: .tr2; .tr3

The [TomeRaider](#) e-book format is a proprietary format. There are versions of [TomeRaider](#) for Windows, Windows Mobile (aka Pocket PC), Palm, Symbian, iPhone and more^[specify]. Several Wikipedias are available as [TomeRaider files](#) with all articles unabridged, some even with nearly all images. Capabilities of the TomeRaider3 e-book reader vary considerably per platform: the Windows and Windows Mobile editions support full [HTML](#) and [CSS](#). The Palm edition supports limited HTML (e.g., no tables, no fonts), and CSS support is missing. For Symbian there is only the older TomeRaider2 format, which does not render images or offer category search facilities. Despite these differences any TomeRaider e-book can be browsed on all supported platforms. The Tomeraider website^[4] claims to have over 4000 e-books available, including free versions of the [Internet Movie Database](#) and [Wikipedia](#).

[\[edit\]](#) Arghos Diffusion

Format: Arghos Reader

Published as: .aeh

The AEH format is an XML-based proprietary format developed by the French firm [Arghos Diffusion](#). AEH files use a proprietary DRM and encryption method and are readable only in the *Arghos Player*. It supports various input formats for text, audio or video, such as PDF, WMA, MP3, WMV, and allows multiple interactive functions such as bookmarking, advanced plain-text searching, dynamic text highlighting, etc.

[\[edit\]](#) Flip Books

Format: Interactive media

Published as:

A "Flip Book" is a type of E-Book distinguished by virtual pages that actually "flip", much like turning pages of paper in a real book or magazine. The first dynamic Flip Book Reader was developed in 2003/2004 by Interaxive Media for Nishe Media (Canada) and was therefore called "Nishe Pages". The first version was produced in part by Cybaris (Canada) and was first publicly showcased in August 2004. Soon thereafter, many copycat "flip books" started appearing thanks to technological advances in Macromedia Flash, mostly hard coded using Flash components.

The original software remains unique in that it is powered by a complete server-based CMS system that allows the books to be created, published, and viewed remotely from a web server without requiring any custom software to be installed. Nishe Media went defunct in 2004, leaving the unfinished software to Interaxive Media who continued its development in Hong Kong. Though not widely used outside of Asia, it is now at version 3.0 and can be a server-based E-Book platform. It remains privately held by the original developer, Ryan Sutherland, owner and founder of Interaxive Media.

[\[edit\]](#) ANSI/NISO Z39.86 (DAISY)

Format: [DAISY](#)

Published as:

The Digital Accessible Information SYstem (DAISY) is an [XML](#)-based open standard maintained by the DAISY Consortium for people with print disabilities. DAISY has wide international support with features for multimedia, navigation and synchronization. A subset of the DAISY format has been adopted by law in the United States as the National Instructional Material Accessibility Standard (NIMAS), and K-12 textbooks and instructional materials are now required to be provided to students with disabilities.

DAISY is already aligned with the EPUB open standard, and is expected to fully converge with its forthcoming EPUB3 revision.

[\[edit\]](#) FictionBook (Fb2)

Format: FictionBook

Published as: [.fb2](#)

[FictionBook](#)^[6] is a popular [XML](#)-based e-book format, supported by free readers such as [FBReader](#), [Haali Reader](#) and [STDU Viewer](#).

[\[edit\]](#) Text Encoding Initiative

Format: [TEI Lite](#)

Published as: [.xml](#)^[*citation needed*]

[TEI Lite](#) is the most^[*citation needed*] popular of the [TEI](#)-based (and thus [XML](#)-based or [SGML](#)-based) electronic text formats.

[\[edit\]](#) Plucker

Format: Plucker

Published as:

[Plucker](#) is a [free](#) e-book reader application with its own associated file format and software to automatically generate plucker files from HTML files, web sites or RSS feeds. The format is a compressed HTML archive, somewhat like Microsoft's [CHM](#).

[\[edit\]](#) Compressed HM

Format: [Microsoft Compressed HTML Help](#)

Published as: [.chm](#)

CHM format is a proprietary format based on HTML. Multiple pages and embedded graphics are distributed along with proprietary [metadata](#) as a single compressed file. In contrast, in HTML, a site consists of multiple HTML files and associated image files in standardized formats.

[\[edit\]](#) Portable Document Format

Format: Adobe Portable Document Format

Published as: [.pdf](#)

A file format created by [Adobe Systems](#), initially to provide a standard form for storing and editing printed publishable documents. The format derives from [PostScript](#), but without language features like loops, and with added support for features like compression and passwords. Because PDF documents can easily be viewed and printed by users on a variety of computer

[platforms](#), they are very common on the [World Wide Web](#). The specification of the format is available without charge from Adobe.

PDF files typically contain brochures, product manuals, magazine articles — up to entire books, as they can embed fonts, images, and other documents. A PDF file contains one or more zoomable page images.

Since the format is designed to reproduce page images, the text traditionally could not be re-flowed to fit the screen width or size. As a result PDF files designed for printing on standard paper sizes are less easily viewed on screens with limited size or resolution, such as those found on mobile phones and [PDAs](#). Adobe has addressed this drawback by adding a re-flow facility to its Acrobat Reader software, but for it to work the document must be marked for re-flowing at creation^[7] — meaning that existing PDF documents won't benefit unless they are tagged and resaved. The Windows Mobile (aka Pocket PC) version of Adobe Acrobat will automatically attempt to tag a PDF for reflow during the synchronization process using an installed plugin to Active Sync. However, this tagging process will not work on most locked or password protected PDF documents. It also doesn't work at present (2009–10) on the Windows Mobile Device Center (the successor to Active Sync) as found in Windows Vista and Windows 7. Thus, automatic tagging support during synchronization is limited to Windows XP/2000.

Multiple products support creating and tagging PDF files, such as Adobe Acrobat, [PDFCreator](#), [OpenOffice.org](#), [iText](#), and [FOP](#), and several programming libraries. [Adobe Reader](#) (formerly called *Acrobat Reader*) is Adobe's product used to view PDF files; third party viewers such as [xpdf](#) are also available. Mac OS X has built-in PDF support, both for creation as part of the printing system and for display using the built-in Preview application.

Later versions of the specification add support for forms, comments, [hypertext links](#), and even interactive elements such as buttons for forms entry and for triggering sound and video. Such features may not be supported by older or third-party viewers and some are not transferable to print.

PDF files are supported on the following e-book readers: [Mobipocket](#), iRex [iLiad](#), iRex [DR1000](#), [Sony Reader](#), Bookeen [Cybook](#), [Foxit](#) eSlick, [Amazon Kindle](#) ([1](#), [2](#), [International](#) & [DX](#)), [Barnes & Noble Nook](#), the [iPad](#), [PocketBook Reader](#), [Bebook Neo](#) and the [Kobo eReader](#). Also, pdf files can be read on the iPod Touch using the free Stanza app.

[\[edit\]](#) PostScript

Format: PostScript

Published as: [ps](#)

[PostScript](#) is a [page description language](#) used in the electronic and [desktop publishing](#) areas for defining the contents and layout of a printed page, which can be used by a rendering program to assemble and create the actual output [bitmap](#). Many office printers directly support interpreting PostScript and printing the result. As a result, the format also sees wide use in the [Unix](#) world.

[\[edit\]](#) DjVu

Format: DjVu

Published as: [.djvu](#)

DjVu is a format specialized for storing scanned documents. It includes advanced compressors optimized for low-color images, such as text documents. Individual files may contain one or more pages. DjVu files cannot be re-flowed.

The contained page images are divided in separate layers (such as multi-color, low-resolution, background layer using lossy compression, and few-colors, high-resolution, tightly-compressed foreground layer), each compressed in the best available method. The format is designed to decompress very quickly, even faster than vector-based formats.

The advantage of DjVu is that it is possible to take a high-resolution scan (300-400 DPI), good enough for both on-[screen reading](#) and printing, and store it very efficiently. Several dozens of 300 DPI black-and-white scans can be stored in less than a megabyte.

[\[edit\]](#) Microsoft LIT

Format: Microsoft Reader

Published as: [.lit](#)

DRM-protected LIT files are only readable in the proprietary [Microsoft Reader](#) program, as the .LIT format, otherwise similar to Microsoft's [CHM](#) format, includes [Digital Rights Management](#) features. Other third party readers, such as [Lexcycle Stanza](#), can read unprotected LIT files. There are also tools such as [Convert Lit](#), which can convert [.lit](#) files to HTML files or [OEBPS](#) files.

The Microsoft Reader uses patented [ClearType](#) display technology. In Reader navigation works with a keyboard, mouse, stylus, or through electronic bookmarks. The Catalog Library records reader books in a personalized "home page", and books are displayed with ClearType to improve readability. A user can add annotations and notes to any page, create large-print e-books with a single command, or create free-form drawings on the reader pages. A built-in dictionary allows the user to look up words.

[\[edit\]](#) eReader

Formerly Palm Digital Media/Peanut Press

Format: Palm Media

Published as: [.pdb](#)

eReader is a [freeware](#) program for viewing Palm Digital Media electronic books. Versions are available for [iPhone](#), [PalmOS](#), WebOS, [Android](#), [Symbian](#), [BlackBerry](#), [Windows Mobile](#) Pocket

PC/Smartphone, desktop [Windows](#), and [Macintosh](#). The reader shows text one page at a time, as paper books do. eReader supports embedded hyperlinks and images. Additionally, the [Stanza](#) application for the [iPhone](#) and [iPod Touch](#) can read both [encrypted](#) and unencrypted eReader files.

The [company's web site - ereader.com](#) maintains a wide selection of eReader-formatted e-books, available for purchase and download, with a handful of [public domain](#) titles available for free. Those books that aren't free are [encrypted](#), with the [key](#) being the purchaser's full name and credit card number. This information is not preserved in the e-book. A [one-way hash](#) is used, so there is no risk of the user's information being extracted.

The program supports features like bookmarks and footnotes, enabling the user to mark any page with a bookmark, and any part of the text with a footnote-like commentary. Footnotes can later be exported as a Memo document.

The company also offers two Windows/MacOS programs for producing e-books: the [Dropbook](#), which is free, and the [eBook Studio](#), which is not. Dropbook is a file-oriented PML-to-[PDB](#) converter; eBook Studio incorporates a [WYSIWYG](#) editor. Both programs are compatible with simple text files.

There is also support for an integrated reference dictionary (with many options up to and including a 476,000-word Merriam-Webster Dictionary, including pronunciation keys) so that any word in the text can be highlighted and looked up on the dictionary instantly. Commercial fonts can also be individually purchased and downloaded at the [company's web site, ereader.com](#).

On July 20, 2009, [Barnes & Noble](#) announced^[8] that the eReader format will be the method they will use to deliver e-books. Updated versions of the Palm Digital programs for Apple iPhone/Touch, Blackberry, Mac OS X, and Windows platforms were made available on the [Barnes & Noble eBooks website](#).

On October 20, 2009, Barnes & Noble announced^[9] that their [Nook Reader](#) will support the eReader format. eReader format is also supported by the discontinued [eSlick](#), an e-reading device from [Foxit Software](#). It is not currently supported on Barnes & Noble's NookColor.

[[edit](#)] Desktop Author

Format: DNL Reader

Published as: .dnl; .exe

Desktop Author is an electronic publishing suite that allows creation of digital web books with virtual turning pages. Digital web books of any publication type can be written in this format, including brochures, e-books, digital photo albums, e-cards, digital diaries, online resumes, quizzes, exams, tests, forms and surveys. DesktopAuthor packages the e-book into a ".dnl" or ".exe" book. Each can be a single, plain [stand-alone](#) executable file which does not require any

other programs to view it. DNL files can be viewed inside a web browser or stand-alone via the *DNL Reader*.

DNL format is an e-Book format, one which replicates the real life alternative, namely page turning Books. The DNL e-Book is developed by [DNAML Pty Limited](#) an Australian company established in 1999. A DNL e-Book can be produced using DeskTop Author or DeskTop Communicator.

[\[edit\]](#) **Newton eBook**

Format: Newton eBook

Published as: .pkg

Commonly known as an [Apple Newton](#) book; a single Newton package file can contain multiple books (for example, the three books of a trilogy might be packaged together). All systems running the Newton operating system (the most common include the Newton MessagePads, eMates, Siemens Secretary Stations, Motorola Marcos, Digital Ocean Seahorses and Tarpons) have built-in support for viewing Newton books. The Newton package format was released to the public by Newton, Inc. prior to that company's absorption into Apple Computer. The format is thus arguably open and various people have written readers for it (writing a Newton book converter has even been assigned as a university-level class project^[10]).

Newton books have no support for DRM or encryption. They do support internal links, potentially multiple tables of contents and indexes, embedded gray scale images, and even some scripting capability (for example, it's possible to make a book in which the reader can influence the outcome).^[11] Newton books utilize [Unicode](#) and are thus available in numerous languages. An individual [Newton book](#) may actually contain multiple views representing the same content in different ways (such as for different screen resolutions).

[\[edit\]](#) **Founder Electronics**

Format: Apabi Reader

Published as: [.xeb](#); .ceb

[APABI](#) is a format devised by [Founder Electronics](#). It is a popular format for Chinese e-books. It can be read using the [Apabi Reader](#) software, and produced using [Apabi Publisher](#). Both .xeb and .ceb files are encoded binary files. The [Iliad](#) e-book device includes an Apabi 'viewer'.

[\[edit\]](#) **Mobipocket**

Format: Mobipocket

Published as: [.prc](#); .mobi

The [Mobipocket](#) e-book format based on the [Open eBook](#) standard using [XHTML](#) and can include [JavaScript](#) and frames. It also supports native [SQL](#) queries to be used with embedded databases. There is a corresponding e-book reader. A free e-book of the [German Wikipedia](#) has been published in Mobipocket format.^[12]

The [Mobipocket](#) Reader has a home page library. Readers can add blank pages in any part of a book and add free-hand drawings. Annotations — highlights, bookmarks, corrections, notes, and drawings — can be applied, organized, and recalled from a single location. Images are converted to GIF format and have a maximum size of 64K,^[13] sufficient for mobile phones with small screens, but rather restrictive for newer gadgets. [Mobipocket](#) Reader has electronic bookmarks, and a built-in dictionary.

The reader has a full screen mode for reading and support for many [PDAs](#), [Communicators](#), and [Smartphones](#). [Mobipocket](#) products support most Windows, Symbian, BlackBerry and Palm operating systems. Using WINE, the reader works under Linux or Mac OS X. Third-party applications like [Okular](#) and [FBReader](#) can also be used under Linux or Mac OS X, but they work only with unencrypted files.

The Amazon Kindle's AZW format is basically just the Mobipocket format with a slightly different serial number scheme (it uses an asterisk instead of a [Dollar sign](#)), and .prc publications can be read directly on the Kindle.

[Mobipocket](#) has developed an .epub to .mobi converter called KindleGen^[14] (supports IDPF 1.0 and IDPF 2.0 epub format, according to the company).

Notably, Eastern European letters with [diacritical marks](#) are not supported^[citation needed].

[\[edit\]](#) EPUB

Main article: [EPUB](#)

Format: IDPF/EPUB

Published as: .epub



 The EPUB logo.

The .epub or [OEBPS](#) format is an open standard for e-books created by the [International Digital Publishing Forum](#) (IDPF). It combines three IDPF open standards:

- Open Publication Structure (OPS) 2.0, which describes the content markup (either XHTML or Daisy [DTBook](#))
- Open Packaging Format (OPF) 2.0, which describes the structure of an .epub in XML
- OEBPS Container Format (OCF) 1.0, which bundles files together (as a renamed ZIP file)

Currently, the format can be read by the [Kobo eReader](#), Apple's [iBooks](#) app running on [iOS](#) devices such as the [iPhone](#), [iPod Touch](#) and [iPad](#), Barnes and Noble [Nook](#), [Sony Reader](#), BeBook, [Bookeen Cybook Gen3 \(with firmware v. 2 and up\)](#), COOL-ER, [Adobe Digital Editions](#), [Lexcycle Stanza](#), BookGlutton, AZARDI, [Aldiko](#) and [WordPlayer](#) on Android, [Freda](#) on Windows Mobile and Windows Phone 7, and the [Mozilla Firefox add-on EPUBReader](#). Several other reader software programs are currently implementing support for the format, such as [dotReader](#), [FBReader](#), [Mobipocket](#), uBook and [Okular](#). Another software .epub reader, [Lucidor](#), is in beta.

[Adobe Digital Editions](#) uses .epub format for its e-books, with DRM protection provided through their proprietary ADEPT mechanism. The recently developed INEPT framework and scripts have been reverse-engineered to circumvent this DRM system.^[15]

[DSLibris](#), a Sourceforge.net project, is able to decode e-books in .epub and .xht format for reading on [Nintendo DS](#) systems.

[edit] Broadband eBooks (BBEB)

Main article: [BBeB](#)

Format: Sony media

Published as: .lrf; .lrx

The digital book format used by [Sony Corporation](#). It is a proprietary format, but some reader software for general-purpose computers, particularly under Linux (for example, [calibre's](#) internal viewer^[16]), has the capability to read it. The LRX file extension represents a DRM encrypted eBook.

[\[edit\]](#) SSReader

Format: SSReader

Published as: .pdg

The digital book format used by a popular digital library company [超星数字图书馆^{\[17\]}](#) in China. It is a proprietary raster image compression and binding format, with reading time OCR plug-in modules. The company scanned a huge number of Chinese books in the China National Library and this becomes the major stock of their service. The detailed format is not published. There are also some other commercial e-book formats used in Chinese digital libraries.

[\[edit\]](#) TealDoc

Format: TealDoc

Published as: .pdb

[TealPoint Software's](#) proprietary reader for Palm OS. In addition to its own format, it opens plain text and PalmDoc files. Newer versions of the software include an editor for Palm OS. Embedded images must be converted to TealPoint's proprietary TealPaint format. The format uses HTML like tags for formatting and has been reverse-engineered for 3rd party programs to edit and convert to/from TealDoc format.

[\[edit\]](#) IEC 62448

Format: IEC 62448

Published as:

IEC 62448 is an international standard created by [International Electrotechnical Commission](#) (IEC), Technical Committee 100, Technical Area 10 (Multimedia e-publishing and e-book).

The current version of IEC 62448 is an umbrella standard that contains as appendices two concrete formats, XMDF of Sharp and BBeB of Sony. However, BBeB has been discontinued by Sony and the version of XMDF that is in the specification is out of date. The IEC TA10 group is discussing next steps, and has invited the IDPF organization which has standardized EPUB to be

a liaison. It is possible that the current version of EPUB and/or the forthcoming EPUB3 revision may be added to IEC 62448. Meanwhile a number of Japanese companies have proposed that IEC standardize a proposed new Japanese-centric file format that is expected to unify DotBook of Voyager Japan and XMDF of Sharp. This new format has not been publicly disclosed as of November, 2010 but it is supposed to cover basic representations for the Japanese language. Technically speaking, this revision is supposed to provide a Japanese minimum set, a Japanese extension set, and a stylesheet language. These issues were discussed in the TC100 meeting held in October 2010 but no decisions were taken besides offering the liaison status to IDPF.

[\[edit\]](#) **Comic Book Archive file**

Format: compressed images

Published as: .cbr (RAR); .cbz (ZIP); .cb7 (7z); .cbr (TAR); .cba (ACE)

A [Comic Book Archive file](#) or ComicBook Reader File consists of a series of image files, typically PNG (lossless compression) or JPEG (lossy compression) files, stored as a single archive file, for the purpose of sequential viewing of images, especially comic books. The idea was made popular by the CDisplay image viewer; since then, many viewers for different platforms have been created. Comic Book Archive files are not a distinct file format; only the file name extension differs from a standard file of the given archive type. Some applications support additional tag information (like artists or story information) in the form of embedded XML files in the archive, or use of the Zip comment function.

[\[edit\]](#) **Multimedia eBooks**

Format: Eveda

Published as: .exe or .html

A [multimedia ebook](#) is [media](#) and [book content](#) that utilizes a combination of different [book content formats](#). The term can be used as a noun (a medium with multiple content formats) or as an adjective describing a medium as having multiple content formats.

The 'multimedia ebook' term is used in contrast to media which only utilize traditional forms of printed or text books. Multimedia ebooks include a combination of [text](#), [audio](#), [images](#), [video](#), and/or [interactive](#) content formats. Much like how a traditional book can contain images to help the text tell a story, a multimedia ebook can contain other elements not formerly possible to help tell the story.

With the advent of more widespread tablet-like computers, such as the [smartphone](#), some publishing houses are planning to make multimedia ebooks, such as Penguin.^[18]