Zotero: A free and open-source reference manager

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Abstract

Zotero is a free, open-source reference management program compatible with Linux®, Mac®, and Windows® operating systems. Libraries are backed up online allowing sharing between computers and even multiple users. Zotero makes it easy to keep your reference library organised and 'clean'. Reference libraries are compatible with other reference management programs, and difficulties can be quickly addressed via online forums. For these reasons, Zotero can be a valuable resource to medical writers.

Keywords: Reference manager, Bibliography, Medical writing, Open source, Freeware

You may remember the time when inserting references in a text was one of the most time-consuming and arbitrary tasks. With time and projects flying by, your bibliography may have become a jungle where finding a specific article began to resemble cave exploration. Fortunately, reference management programs have been developed to make writers' lives easier.[1] Several programs are available, including Mendeley® (acquired in 2013 by Elsevier), EndNote® (Thomson Reuters), and Biblioscape (CG Information). In contrast to previous articles comparing several reference managers,[2,3] this article focuses Zotero, a *free and open-source program* originally developed by the Center for History and New Media at George Mason University and the Corporation for Digital Scholarship in the USA.

What you can do with Zotero

Collecting and organising references

Zotero is useful at all stages of citing sources, from conducting bibliographic searches to writing documents. When you read citations on a computer, tablet, or mobile device,[4] Zotero automatically collects 'metadata' (details such as authors, title, and date) that are stored in your electronic library. Metadata can also be recovered from the PDFs of the published articles (at least dating from around 2000) or by using article identification numbers. Libraries can be organised in collections as you would organise file folders on your computer (Figure 1), and files, notes, or links, even full texts, can be associated with each reference. PDF files are automatically downloaded when available (open access articles, for instance) and Zotero can rename them according to first author, year, and title. Zotero includes a search bar that helps find references within your library. This search function even includes the text within PDF files. Zotero also has a 'locate' button that helps finding items online. Libraries from other reference managers may be imported in Zotero.[5]

Inserting citations into a document

Zotero is compatible with Microsoft Word®, LibreOffice, OpenOffice, and NeoOffice. When writing a document, you may easily insert citations by clicking on Zotero buttons. Your reference list is also automatically created and you can switch citation format as often as needed. A style repository containing more than 6700 styles is available online;[6] if the style you need is not on the list, you may find a similar style using the 'search by example' tool.[7] In-line citations and bibliographies may be personalised (e.g. remove author or add page numbers), and journal titles may be automatically abbreviated when needed. Some styles also include a translator that adapts terms in cited references (e.g. 'available at', 'accessed', etc.) to a specific language.[8]

Saving, synchronising, and sharing libraries

Zotero works much like Google Docs® or Dropbox®. When you create a personal account on Zotero, you receive 300 MB of free online storage, although this can be increased for a small fee.[9] Zotero synchronises your computer with your online account so that all of your references are backed up on Zotero servers. You can even synchronise several
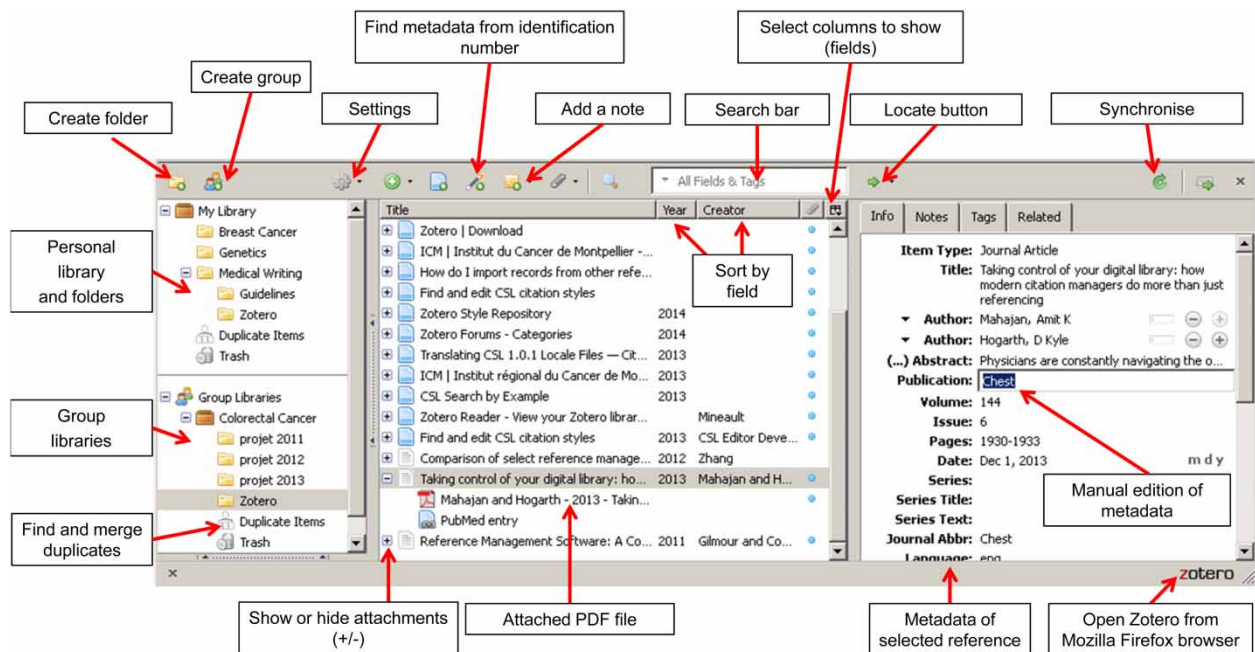
Figure 1: Screenshot of Zotero window. Identification numbers include Digital Object Identifier (DOI, unique for each article), International Standard Book Numbers (ISBN, unique for each book), or PubMed ID numbers.

computers to a single account so that you are always working with the latest version of your bibliography, regardless of which computer you are using. Furthermore, by logging into zotero.org, you can access your library from anywhere.

References may be shared between different users through group libraries. The owner of the group can invite anybody to join (a Zotero account is necessary) and configure reading and editing rights for each member. Groups are particularly useful when several authors contribute to writing a common document. Indeed, each author can edit citations using Zotero, provided that the references cited in this document come from a group library. Groups may be public or private. Creating a public library is a free and easy way to list collective or individual publications and make them more widely known. Moreover, because Zotero is open-source, a developer can easily post online and keep up to date your list of publications (e.g. see the website for the Institut du Cancer de Montpellier[10]).

How to install Zotero

Zotero is compatible with Linux, Mac, and Windows operating systems.[11] It was initially developed as an add-on to the Mozilla Firefox® web browser. People preferring other browsers can download the Zotero Standalone version completed by a browser extension (for Safari® or Google Chrome®) or a bookmarklet[12] (for all other web browsers). Both versions offer exactly the same services, although the Firefox add-on opens as a window

within the browser while Zotero Standalone runs as an independent application. However, in contrast to Zotero Standalone, the Firefox installation (including Zotero add-on) does not require administrator rights on the computer. A plugin for word processing programs must also be installed to allow the insertion of citations in the text.[11]

Strengths and limitations of Zotero

Strengths

- Zotero is free and open-source. Worldwide developers continuously contribute to its improvement.
- Zotero can be installed without administrator rights.
- A wide variety of styles is already available, and finding the appropriate style is easy.
- Libraries can be shared, allowing collective use and pooling of bibliography searches.
- The metadata retrieval tool allows you to 'tidy up' PDF files stored on your computer, which comes in handy when the file names are unclear.
- A quick-start guide and numerous tutorials are available in multiple languages.[13]
- Difficulties and style requests can be quickly addressed via online forums.[14]
- Libraries are compatible with other reference management programs.[5]
- Many 'tips and tricks', including applications for tablets or mobiles, are available to simplify reading and collecting citations in your bibliography.[4,15]

Limitations

- Editing and creating styles can be difficult. I recommend using the visual editor at http://editor.citationstyles.org/visualEditor/.
- So far, the quick search bar can look for references within a single group library but not within all group libraries simultaneously.
- Computers may be slowed while citations are inserted or the library is synchronised.

Conclusion

Collecting, organising, citing, and sharing references used to take an enormous amount of time. The task is now much simpler thanks to reference management software. Zotero is a free and open-source reference manager program that has many advantages and should be considered by medical writers. For more information about Zotero, take a look at zotero.org.

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Conflicts of interest and disclaimers

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