

A Comparative Analysis of Zotero and Mendeley Reference Management Software

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Abstract—This paper presents a comparison of the reference management software between Zotero and Mendeley and the results were drawn by comparing the two software's. The novelty of this paper is the comparative analysis of the software and it has shown that Mendeley can import more information from the Google Scholar for the researchers. This finding can help to know researchers to use the reference management software.

Keywords—Analysis, comparative analysis, zotero, researchers, Mendeley.

I. INTRODUCTION

REFERENCE management software helps researchers to write research papers in a desired format and it reduces workload burden for writers in terms of edit and proofread the references and finally avoid errors [7]. Reference [31] stated that the typical functions of the reference management software include: import references from different sources (biographical databases); search, edit, sort, and to share references; render the references in the variety of formats; select the references to incorporate them in the word-processed document and format them automatically; and store the links for the documents or copy it within the database. According to [5], the reference management software is also popularly known as bibliographic software, citation management software, or personal bibliographic file managers. Reference [27] indicated that various reference management software available in the market but it varies with regard to cost, functionality, and the network capabilities. Some reference management software, namely, EndNote, RefWorks, etc. are licensed or sold outright. On the other hand, other software such as Mendeley and Zotero are available at very little cost or there is no cost for the users. [27] Stated that reference management software is one of the most important aspects and the essential for all levels of researchers. References [8] and [9] stated that the reference management software assist each researchers to record, to organize, and to use of the citation that can be used in the course of their work. Reference [3] indicated that using reference management software researchers can easily track of their literature which they read and facilitate to edit for the scientific paper usually they write. Reference [4] indicated that the reference management software established for researchers and students as a time saving tool to writing their academic papers.

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II. PROBLEM STATEMENT

According to [10], references are very important because incorrect references frustrate readers while searching for specific articles. References [11]-[13] indicated that errors rate in published medical journals (general and specialty) ranging from 3% to 60%. Research results by [14] indicated that the reference errors in the Journal of Nepal Paediatric Society are 33.3%, Nepal Journal of Obstetrics and Gynaecology is 43.3%, and in the Nepalese Journal of Ophthalmology is 50% respectively. Reference [15] indicated that the errors rate in two radiology journals with a vast error rate of 2% and a minor error rate of 45% for the American Journal of Roentgenology (AJR), where the radiology got the major rate of 2% and a minor error rate of 23%. Reference [2] found that in the five psychology journals, the errors rates are: title of the article (15%), authors (12%), page number (6%), volume numbers (3%), and journal title (2%). According to [16], in the Hong Kong Medical Journal (volume 1 (1995) and volume 2 (1996)), the inaccuracies and overall errors rate 61% of the references in the volume 1 and 51% of the references in the volume 2. Reference [1] found from the three major surgical journals, the errors rate of 36% and 27% overall incidence of citation and quotation errors respectively.

III. AIM AND OBJECTIVES

The aim of this paper is the comparative analysis of Zotero and Mendeley reference management software through the electronic database to see which software can import data more accurately. This aim is achieved through the specific objectives: to identify which software is more accurate in terms of importing citations, reference, and the ease of use; to identify the similarities for the specific fields of the reference management software.

IV. LITERATURE REVIEW

The aim of this section is to present the existing literature for the systematic by the researchers using reference management software through electronic database searching, duplicate records, identification, and elimination, etc. Studies conducted by [18], where 78 respondents participated and their findings indicated that these researchers have used reference management software for their systematic review. References [6] and [17] indicate that reference management software facilitate researchers in terms of capture and organize of the studies which have identified through the electronic database search, duplicate records eliminate from the multiple database search. Another study conducted by [19] found that

bibliographic software help researchers to organize and store the research results and it also helps to appraise and code the search results to explicitly to track the researchers' decision for the systematic review. According to [23], Zotero and Mendeley allow researchers to save the snapshots of web pages and annotate them within the citation library. Reference [23] stated that both the software can scrap citation information from web-based publications and some commercial and social networking sites.

A. Zotero (Product Information)

According to [22], Zotero is a free and open source Firefox browser extension and it was first released in 2006 by the Center for History and New Media at the George Mason University, Fairfax, VA. Zotero reference management software used to import structured data which includes journal article, from web pages, and to provide the automated bibliographies and the citations and finally it also helps to share. References [27]-[30] stated that Zotero citation management software can be used to "collect, organize, cite, and share" research resources and they have also stated that Zotero reference management software supports different websites, namely Web of Science, PubMed Central, Science Direct, Google Scholar, Google Books, Wikipedia, amazon, etc. and it also hold publication of data such as DOI, ISBN, or PMID.

Reference [3] stated that Zotero brings the features of the reference management software into browser environment and this software is completely lies within a frame in the browser, and the simple icon allows the user to import citations with the single click from any kind of the web content. Reference [26] states cited in [21] that Zotero reference management software quickly got popularity because it is the free open source and it is also alternative to EndNote. According to [20], Zotero is the open-source and it provides for the developers to enhance the features and it can also interface with the mobile applications on the both iOS and Android mobile platforms.

B. Mendeley (Product Information)

According to [22], using Mendeley users can easily download their PDFs via the desktop clients and this software automatically extract metadata, the citations can be shared publicly or privately. Mendeley reference management software is currently free for the individual users with the premium multigigabyte storage upgrades and additional groups' allocations available for purchase.

According to [25], Mendeley reference software serves as a self-contained PDF viewer, letting users view PDFs and also annotate them. It also synced via a cloud and gives a certain amount of space for free and also extra space available for free. Reference[25] also indicated that the Mendeley can be viewed how many users have read them and what their discipline was.

Mendeley reference management software facilitate researchers because it is free software/web hybrid for PC, Mac, Linux; to organizes and manages PDFs which already have stored on the computer; annotate PDFs; search within the

text of all PDFs, etc. [24]. According [3], Mendeley reference management software is a desktop application and it is synced with online user's profile and it is web-social-oriented software.

V. METHODOLOGY

The keyword was used Academic Workload and Quality to search articles from Google Scholar and an article was imported from the Google Scholar using Zotero and Mendeley reference management software. Using this software, the first article from the Google Scholar was imported. The name of the article was Academic Workload and Quality. Both the software was downloaded and installed in the desktop PC and the data was imported from the Google Scholar based on the same article using both software into the library.

VI. RESULTS

Table I shows that some fields of both the software similarly imported data from the Google Scholar. On the other hand, some fields are not similarly imported. Similarities fields imported from Google Scholar by both the reference management software includes *Author, Title, Year, Journal name, Volume no., Issue no., Pages*. On the other hand, dissimilarities fields imported by both software include *Publisher, ISSN no., URL, DOI*. Furthermore, it is noted that the above software such as Zotero and Mendeley was downloaded from the Internet and was installed and used for the experiment to import for referencing from the Google Scholar without customizing or changing any application or selecting any options the software. This is summarized as below:

TABLE I
 IMPORTED AND NON IMPORTED FIELDS FROM THE GOOGLE SCHOLAR

Fields	Zotero	Mendeley
Author	1	1
Title	1	1
Year	1	1
Journal name	1	1
Volume no.	1	1
Issue no.	1	1
Pages	1	1
Publisher	0	0
ISSN no.	0	0
URL	0	1
DOI	0	1

1=imported **Fields** from the Google Scholar.
 0=not imported **Fields** from the Google Scholar.

Fig. 1 shows the comparative graphical presentation of Mendeley and Zotero reference management software.

The Fig. 2 shows that the Zotero reference management software did not import few fields from the Google Scholar, namely, *Publisher, ISSN no., URL, and DOI*. On the other hand, Zotero reference management software has imported from the Google Scholar, namely, *Author, Title, Year, Journal Name, Volume no., Issue no., and Pages*.

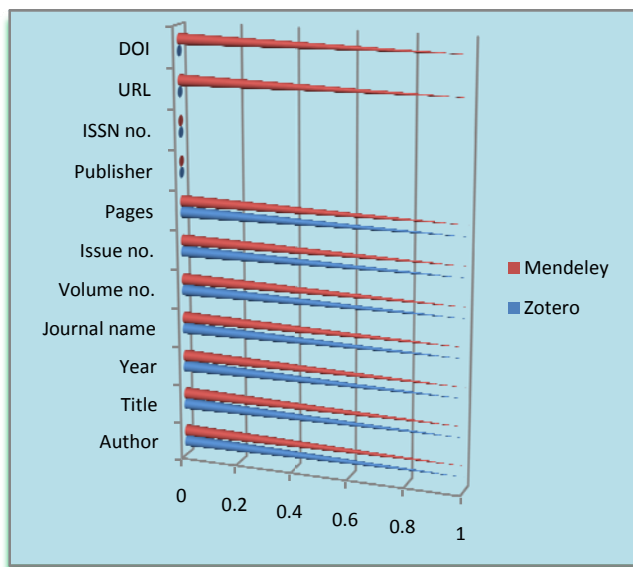


Fig. 1 Comparative analysis of the two reference management software Mendeley and Zotero

recommends the researchers should use the reference management software for their referencing and citation.

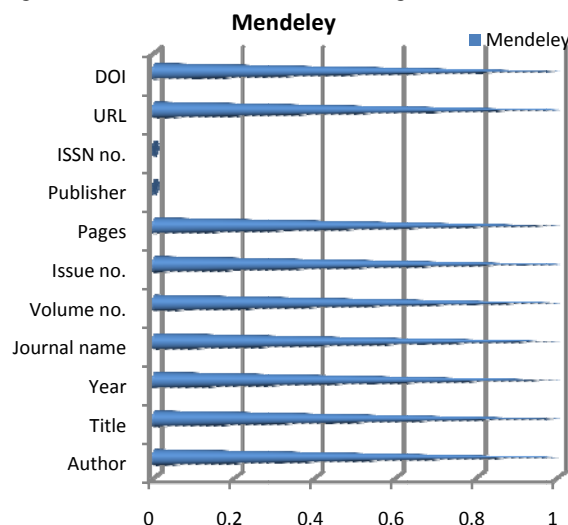


Fig. 3 Fields imported using Mendeley reference management software

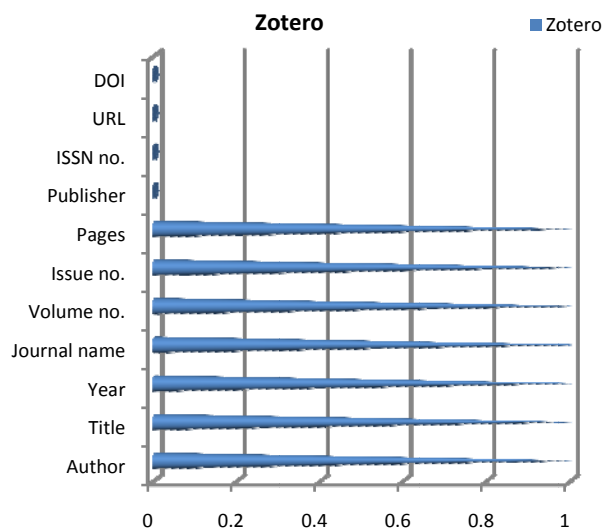


Fig. 2 Fields imported using Zotero reference management software

Fig. 3 shows that the Mendeley reference management software did not import few fields from the Google Scholar, namely, *Publisher and ISSN no.* On the other hand, Mendeley reference management software imported fields from the Google Scholar, namely, *Author, Title, Year, Journal Name, Volume No., Issue No., Pages, URL, and DOI.*

VII. CONCLUSION AND RECOMMENDATION

This study has reported that the reference software plays a very important role and it can be used by researchers. However, it clearly shows that Mendeley reference management software can import more fields from the Google Scholar. Furthermore, it has also showed that it can make more accurate referencing and citation compare to the manual system for the researchers. Finally, this study however,

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