

# Reference Management Software: Comparative Analysis of RefWorks and Zotero

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

**Keywords**—Analysis, comparative analysis, reference management software, researchers.

## I. INTRODUCTION

REFERENCE management software is a tool that is used by the researchers (scholars, scientists, etc.) to maintain their records and utilize the bibliographic citation. According to [11], the reference management software is one of the most challenging aspects for researchers because the format of the reference is usually based on the variety of citation styles which has made the reference manager an important tool for researchers. The use of reference management software is well established among researchers and students [5]. The main purpose of this software is to store, organize, format reference within the manuscript and this software existed since 1980s to till today and it is widely used by researchers [24]. With the help of reference management software researchers can easily keep track of their records and facilitate to edit for scientific papers they write [4]. According to [13], there are more than 25 reference management software exists and among them some are free and while others have the high registration fees or difficulty to download or to install. In a study by [29] argued that reference management tools helps researchers to save their time to write their writing their academic papers. In a study by [15] indicated that the reference management software popularly known as personal bibliographic file managers, citation management software, or bibliographic software. It helps to construct and customize the databases of the literature references and manage the citation and formatting of a list of the references, insert the new citation into the seamless operation [33].

## II. PROBLEM STATEMENT

Reference [23] reported that error rate in the reference in five leading medical journals from 4.1% to 40.3%. According to [6], 49% errors contain in the reference section in 107 articles and the total errors of 142. Errors prevent researchers

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to retrieve the original articles because computer cannot recognize any inaccurate information such as author's name, article title [20], [9]. Citation and reference errors are very common in nursing and medical journals. Errors in nursing journals 22.9% [17], in neonatal-maternal nursing journal is 24.4% [19], and in the paediatric nursing journals the error rate is 41.6% [18]. According to [1]-[2], [12], [14] the high error rate in the medical literature causes the significant problem. Reference [16] indicated based on the experiment on 12 journals on the business and economics and concluded that an average of 41.7% of references having at least one error and the majority of the errors pertaining to the authors' names, errors pagination, errors in articles or chapter titles. Reference [3] indicated based on the experiment of the five psychology journals and they concluded that errors in the title of the article is 15%, followed by authors (12%), page number (6%), volume numbers (3%), and the journal title (2%). Studies by [30]-[32] argued that the errors rate in the published medical journals (general and the specialty) ranging from the 3% to the 60%.

## III. AIM AND OBJECTIVES

The aim of this article is the comparative analysis of RefWorks and Zotero to see which software can produce systematic review with more accuracy for the researchers. The main aim is achieved through the specific objectives: to identify the software which is more accurate in terms of citations, reference, and the ease of use for researchers; to identify the similarities for the fields of the reference management software.

## IV. LITERATURE REVIEW

The aim of this section is to present the existing literature on the systematic review for reference management software through electronic database searching, duplicate records identification, and elimination and so on. The reference management software is popularly known as bibliographic software, citation management software, or the personal bibliographic file managers [15]. According to [7], [11], [26] reference management tools first was developed in 1980s and it was marketed for researchers to create online indexes of personal print-article collection. In a study by [22], [24] indicated that reference management software can facilitate researchers to capture and organize of the studies identified through electronic database search, eliminate the duplicate record from the multiple database searchers. In a study conducted by [34] indicated that the reference management software is very useful for authors and editors in the

biomedical journals. However, studies by [35], [36] found from their research results and indicated that the reference management software can facilitate researchers in terms of collection of reference quickly, accurately, and more correctly. References [22], [24] showed that from their survey and indicated that 79.5% had used the reference management software for their review. However their studies also concluded that 4.8% of the respondents used in their published studies.

#### A. RefWorks(Product Information)

According to [10] website, the RefWorks is a “fully functioning, general use bibliographic management program that stores, organizes, and formats data” and also “creates full in-text citations in addition to footnote formatting”. Reference [21] stated that, according to the company, “Write-N-Cite, RefWorks’ word processing piece, is popular among researchers, as is RefWorks’ web-based, software-as-a-service aspect, and its easy-to-use data import, collaboration, and formatting”. Reference [8] stated that RefWorks reference management tool is web-based and compatible with all platforms. Users can easily adopt the interface to export the references into RefWorks. Furthermore, user can also import reference from the library catalogs, other citation managers, RSS feeds, and the websites. However, [8] indicated that RefWorks can add the attachment feature, researchers can upload 100MB of different files, and the administrator can increase the limit up to 5GB.

#### B. Zotero (Product Information)

Zotero ([www.zotero.org](http://www.zotero.org)) is a browser-based tool which is provides the online functionality and provides the ability to work with the internet connection. Zotero can interface with many mobile applications such as iOS and the Android mobile platforms [27]. Zotero was released in 2006 by the George Mason University as a Firefox browser extension and Zotero focused to collect, save webpages and their metadata to create the bibliography [25]. According to [28], Zotero allows researchers to cite their database with plugins when they write an article in word document or Open Office or by drag them Zotero into a web based program which include Google documents or Gmail. Reference [28] also stated that Zotero is an open source and has the extensive user community, and it is free up to 100MB of storage. Reference [8] stated that Zotero was developed by a team of librarians at the Center for History and New Media at the George Mason University and it is a free extension for the Firefox browser. Reference [8] further stated that Zotero has the capability to recognize and import the PDF metadata and using this reference management tool, researchers can easily cite as they write their applications such as Microsoft Word, Mac Word, and Open Office.

### V. METHODOLOGY

The keywords used to import information (field) from the Google Scholar are *Academic Workload and Quality* and the article name was *Academic Workload and Quality*. Using both the software RefWorks and Zotero information (field) was

imported and both the software were downloaded and installed in the desktop PC without customizing or changing any option of the application of the software. The data was imported from Google Scholar based on the same article.

### VI. RESULTS

Table I shows that some fields of both the software can similarly import from the Google Scholar but in some cases are not similar which is *publisher* filed. The *publisher* field was imported by RefWorks and this field was not imported by Zotero. There are some fields which were not imported by both the software and they are: *ISSN no.*, *URL*, *DOI*. This is summarized as below:However, it is noted that the RefWorks and Zotero was downloaded from the Internet and was also installed in to the PC. Finally, this two software was used for the experiment to import referencing from Google Scholar without customizing or changing any application or selecting any options of software. This is summarized as below:

TABLE I  
IMPORTED AND NON IMPORTED FIELDS FROM THE GOOGLE SCHOLAR

Fields	RefWorks	Zotero
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	1	0
ISSN no.	0	0
URL	0	0
DOI	0	0

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

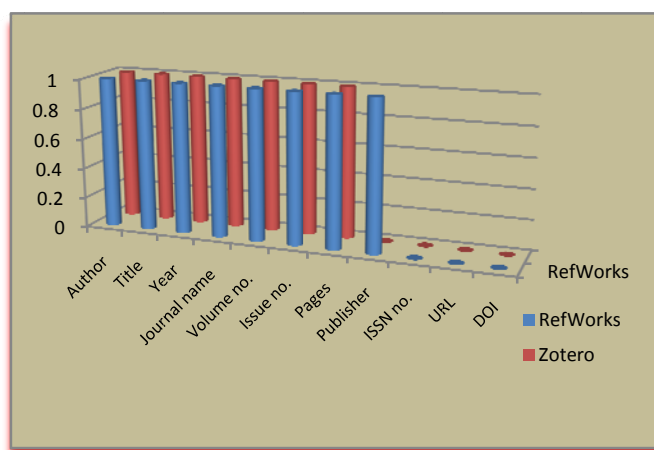


Fig. 1 Comparative analysis of RefWorks and Zotero reference management software

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

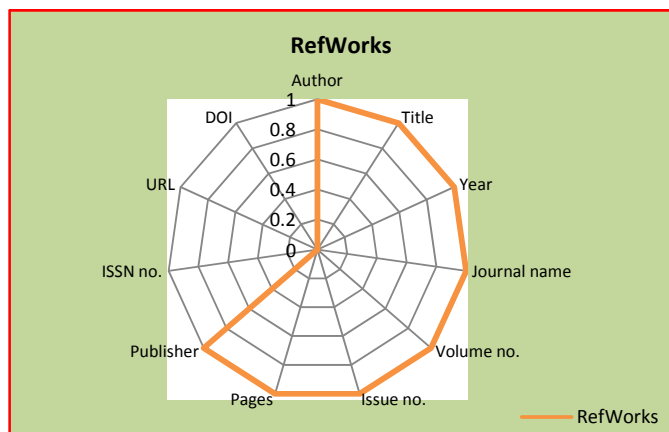


Fig. 2 Fields imported using RefWorks reference management software

Fig. 2 shows that the RefWorks reference management software did not import few fields from the Google Scholar such as *ISSN no.*, *URL*, and *DOI*. On the other hand, this software has imported the following information (fields) namely *Author*, *Title*, *Year*, *Journal Name*, *Volume no.*, *Issue no.*, and *Pages*.

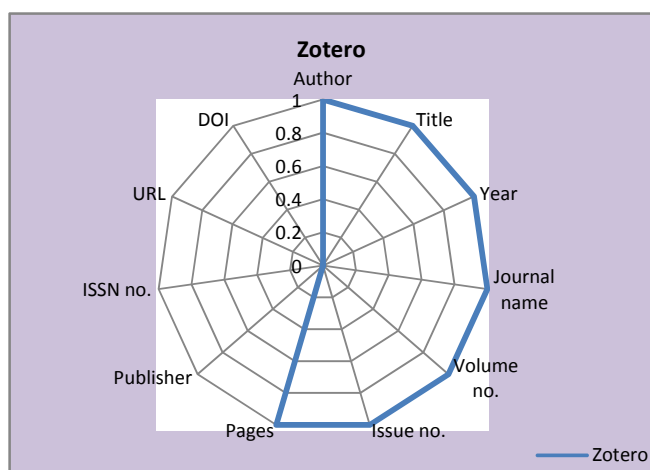


Fig. 3 Fields imported using Zotero reference management software

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

## VII. CONCLUSION AND RECOMMENDATION

This study has informed that the reference software is very important to be used by researchers and it clearly shows that the RefWorks reference management software import more fields from the Google Scholar. However, it has also shows that it can help to make more accurate referencing and citation compare to the manual system for researchers. Finally, this study however, recommends the researchers should use the

reference management software for their referencing and citation.

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