

# Use of Reference Management Software among Science Research Scholars in University of Kerala

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**Abstract** - The purpose of this study is to make a comprehensive study of the use of Reference Management Software among the science research scholars of University of Kerala. Main objective of the study was to identify the use of different types of Reference Management Software used by research scholars. Study also aims to find out the features preferred by science researchers from different Reference Management Software. Proportionate stratified sample of 166 (63%) out of 266 full time Science research scholars of University of Kerala was selected and questionnaires were distributed among them. Study is conducted through structured questionnaire.

**Keywords:** Reference Management Software, Science Research Scholars

## I. INTRODUCTION

Reference Management, the storage, organization and use of references, is an important aspect of scholarly communication. Referencing and proper citing of the references is a key component while communicating the research findings. Within the literature, the inaccurate bibliographical information stemming from references has been considered as a major hurdle in the retrieval of these sources (Steele, 2008). The advancement of the internet, awareness of copyright, plagiarism and scientific value of research are some of the important aspects which have led both researchers and publishers to advocate for proper citation of the material in academic writings (McCullen, 2003).

Reference Management Software also called "Bibliographic" or "Citation Management Software" was developed to help authors manage their references, regardless of how many they may have and to maintain consistency when referencing. These specialized software packages allow researchers to manage a concise of references which are available in numberless formats and efficiently disseminate the research findings with very little referencing flaws. Reference Management Software is the possible solution to search, store, annotate, communicate and present the research output and present the research output and citation in a professional and organized manner. Now, there are more than 25 different RMS packages available for use (Mead and Berryman, 2010). Some of the most popular packages are EndNote, Refworks, CiteULike, Mendeley and Zotero.

## II. REVIEW OF LITERATURE

Nicholas Lonergan(2017) studied to determine faculty preferences and attitudes regarding reference management software (RMS) to improve the library's support and training programs. A short, online survey was emailed to approximately 272 faculties. Survey results indicated that multiple RMS was in use, with faculty preferring Zotero over the library-supported RefWorks. More than 40 per cent did not use any RMS... These findings support the necessity of doing more research to establish the parameters of the RMS environment among faculty, with implications for support, instruction and outreach at the institutional level.

Mehrbakhsh Nilashi *et al.*, (2016) in their paper, a fuzzy logic approach was adopted for assessing the features of RMS from the researchers' perspectives. Accordingly, a web-based survey was conducted and data collected from the researchers who had experience with different types of RMS. Then, author analysed the effects of RMS features on researcher perception in selecting an appropriate reference management program and find the importance level of those features. This study provides a toolset for RMS developers to identify the importance level of RMS features and accordingly consider these important features in developing the next generation of citation management software.

Anne Melles and Kathryn Unsworth (2015) studied the reports on the findings of a small-scale applied research project aimed at understanding the reference management practices of postgraduate students and academics in the Arts Faculty at Monash University. A questionnaire was completed by 81 students and semi-structured interviews were conducted with 8 students and 13 academics in the Faculty. Analysis shows that the reference management practices detailed in this study are individual and personal, and do not always involve the use of RMS. RMS use itself is also varied, with few of the interviewees utilizing all the core features of the software. A broader approach to reference management instruction and support would increase the relevance of library instruction.

Maryam Sarrafzadeh, Afsaneh Hazeri (2014) investigated the familiarity and use of reference management software

(RMS) by library and information science (LIS) faculties in Iran, This is a descriptive survey. Data collected by a Web-based questionnaire include both open-ended and multiple-choice questions. The questionnaires were distributed among LIS discussion groups and were sent to the e-mails of LIS faculties. Results reveal that over half of the respondents had a good familiarity with the various citation software packages and knew how to use them; 35 per cent of respondents have learned how to use these packages through formal education.

Enrico Francese (2011) presented an online survey taken at Tallinn University (TLU), Estonia, aiming to measure the usage of Reference Management Software (RMS) in an academic environment. A descriptive survey, based on a constructivist approach, has been conducted through an online questionnaire. The questionnaire was sent to a list of 754 members of TLU, comprising PhD students, Researchers, Professors. RMS seems to suffer a low spread among scholars; a general awareness is present. The data collected can be used as background for a deeper qualitative case study. This survey is the first quantitative study made on the subject.

### III. OBJECTIVES

Major objectives of the study are:

1. To identify different types of Reference Management Software used by research scholars.
2. To ascertain extend of use of Reference Management Software.
3. To find out the features preferred by researchers from different Reference Management Software.
4. To identify the constraints faced by the researchers while using Reference Management Software.

### IV. METHODOLOGY

Literature survey using primary and secondary sources were conducted to identify relevant literature related to the study. Proportionate stratified sample of 166 (63%) out of 266 full time Science research scholars of University of Kerala was selected and questionnaires were distributed among them and 131 (79%) questionnaire were completed and returned by them. A structured questionnaire was used to collect the data.

### V. RESULTS AND DISCUSSION

The data were analyzed using SPSS V20 and MS Excel 2010. The data obtained through the questionnaire were tabulated analyzed and interpreted in the following sections.

The research scholars use different reference management software for their research work. Major reference management softwares identified by respondents are shown in table I. Analysis shows that majority of respondents used Mendeley 76.3%, followed by EndNote 38.2%, Zotero 26% and BibTex 25.2%, but the usage of other Reference Management Software such as EndNote Web and BibDesk 4.6%, Qiqqa and CiteUlike 3.8%, Bookends 2.3% are limited.

TABLE I REFERENCE MANAGEMENT SOFTWARE USED

RMS	No. of respondents	Percentage
Mendeley	100	76.3
EndNote	50	38.2
Zotero	34	26
BibTex	33	25.2
Papers	26	19.8
Reference Managers	19	14.5
Citavi	17	13
Refworks	11	8.4
EndNote Web	6	4.6
BibDesk	6	4.6
Qiqqa	5	3.8
CiteUlike	5	3.8
JabRef	3	2.3
Bookends	3	2.3

TABLE II REASONS FOR CHOOSING RMS AMONG OTHERS

Reason for choosing RMS	No. of respondents	Percentage
Free of cost	61	46.6
Suggested by colleagues	51	38.9
Best performing RMS	34	26
Provided by institution	34	26
Read an article	16	12.2

In order to improve the use of reference management software, it is necessary to understand the reason for choosing the particular software Table II indicates that most of the respondents (46.6%) used Reference Management Software which is free of cost, 38.9% of respondents choose Reference Management Software suggested by colleagues, 26% of respondents used the tool provided by the institution .26% choose the best performing Reference Management Software.

TABLE III DURATION OF USE OF RMS

Duration of use	No. of respondents	Percentage
Less than 1 year	53	40.5
From 1 to 2 years	64	48.9
From 2 to 5 years	14	10.7
Total	131	100

Duration indicate the extend of use of software and familiarity of researcher with the software. From the Table3 shows that 48.9% of respondents have been using Reference Management Software for 1 to 2 years, 40.5% of respondents have been using RMS less than 1 year. 10.7% have been using RMS from 2 to 5 years.

TABLE IV ASSOCIATIONS BETWEEN REFERENCES SAVED AND EASE OF USE

Variables	V. easy	Moderately easy	Difficult	V. difficult	$\chi^2$	P value
Less than 50	5(3.82%)	41(31.29%)	8(6.10%)	0(0%)	21.574	0.010*
51-100	5(3.82%)	23(17.56%)	3(2.29%)	3(2.29%)		
101-500	10(7.63%)	22(16.79%)	2(1.53%)	0(0%)		
Greater than 500	4(3.05%)	3(2.29%)	2(1.53%)	0(0%)		

Not significant (>0.05); \*: Significant (<0.05)

In order to identify whether the number of references saved have any impact on the ease of use of Reference Management Software., hypothesis was formulated as H1: There is a significant association between reference saved and ease of use of Reference Management Software.

Hypothesis is tested using Chi square test. From the Table IV, it is observed that there exists statistically significant association between reference saved and ease of use of Reference Management Software. ( $\chi^2 = 21.574$ , P = 0. .010 < 0.05). Thus hypothesis H5 is accepted.

TABLE V FEATURES OF REFERENCE MANAGEMENT SOFTWARE

RMS Features	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
Save references	52(39.7%)	30(22.9%)	25(19.1%)	10(7.6%)	7(5.3%)	7(5.3%)
Pasting references	17(13%)	21(16%)	25(19.1%)	33(25.2%)	17(13%)	18(13.7%)
Editing and formatting references in the needed citation style	32(24.4%)	23(17.6%)	34(26%)	13(9.9%)	18(13.7%)	11(8.4%)
Organizing r for easier retrieval and management	20(15.3%)	34(26.0%)	23(17.6%)	19(14.5%)	20(15.3%)	15(11.5%)
Sharing references with colleagues	9(6.9%)	8(6.1%)	8(6.1%)	31(23.7%)	51(38.9%)	24(18.3%)
Import from bibliographic database	1(0.8%)	15(11.5%)	16(12.2%)	25(19.1%)	18(13.7%)	56(42.7%)

Respondents were asked to rank the important features of Reference Management responses are shown in Table V. Among 131 respondents in science faculty 39.7% gave first preference to save references, second preference to organizing references for easier retrieval and management (26.0%), third preference to editing and formatting references in the needed citation style (26%), fourth preference to pasting references into the paper (25.2%), fifth preference to sharing references with colleagues (38.9%) and last preference was given to import from bibliographic database integrate word processor (42.7%).

difficulties is that insufficient training111 (84.7%). The second most hurdle while using the RMS is lack of technical support 95 (72.5%). Followed by other major difficulties of respondents faced due to slow internet bandwidth 84 (64.1%), lack of citation style knowledge 82 (62.6%), time consuming 55 (42%), software is too complex and language difficulties 14 (10.7%).

TABLE VI BARRIERS IN ACCESSING RMS

Barriers in using RMS	No. of respondents	Percentage
Insufficient training	111	84.7
Lack of technical support	95	72.5
Slow internet bandwidth	84	64.1
Lack of citation style knowledge	82	62.6
Time consuming	55	42
Software is too complex	48	36.6
Language difficulties	14	10.7

The respondents were requested to furnish the details regarding the difficulties faced by respondents in a using the RMS. Table VI, highlights that's the most obvious

VI. FINDINGS

Finding of the study are:

- majority of the respondents used Mendeley for their research work
- About half of the respondents choose the reference management software which is free of cost
- 48.9% of the researchers have been using the reference management software for 1to 2 years
- There exists statistically significant association between reference saved and ease of use of Reference Management Software
- Saving of references was ranked as the first important feature of reference management software and last preference was given to importing references from bibliographic databases
- Majority of the respondents identified insufficient as the major barrier in using reference management software

## VII. CONCLUSION

The main objective of the study was to make a comprehensive study of the use of Reference Management Software among the science research scholars of University of Kerala. Departments as well as university libraries should take a lead role in spreading knowledge about Reference Management Software. Overall, it was found that most of the science scholars are aware about Reference Management Software, but they have little knowledge about how to use it. It is suggested that university and department libraries should provide training programmes, library orientation programmes, seminars and workshops to encourage the use of Reference Management Software

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