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A Bibliometric Analysis of Research on Resource Description and Access (RDA) in Library and Information Science Journals in Web of Science (2006-2020) Using VOSviewer

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Abstract

The purpose of this study was to conduct a bibliometric analysis of the Resource Description and Access (RDA) research in library and information science journals in Web of Science. Two hundred and fifty-eight journal articles related to RDA were extracted from Web of Science for analysis for the period between 2006 and 2020. A descriptive analysis of the most productive authors, institutions, countries, and journals and the most cited authors was conducted. To illuminate the major themes, the selected articles were also subjected to a co-word analysis and a document co-citation analysis using the visualization tool VOSviewer. The co-word analysis revealed five clusters of themes: (1) RDA implementation, (2) RDA and other metadata standards and technologies, (3) RDA and FRBR, FRAD and ISBD, (4) RDA and Anglo-American Cataloging Rules, (5) RDA and descriptive cataloging, authority control, catalogers, and training. The document co-citation analysis identified two distinctive clusters of themes: RDA testing, training and implementation, and RDA and FRBR-related conceptual models. An analysis of the temporal evolution of the themes showed that other metadata standards and technologies, especially linked data, and Bibframe, received more attention in recent years.

Keywords: Resource Description and Access (RDA), bibliometric analysis, Functional Requirements for Bibliographic Records (FRBR), linked data, productivity, co-word analysis, co-citation analysis, journals, Web of Science, VOSviewer

I. Introduction

For decades, Anglo-American Cataloguing Rules (AACR) have been a library cataloging standard. The standard was first published in 1967. Its second edition AACR2 was published by the American Library Association, the Canadian Library Association, and the Chartered Institute of Library and Information Professionals in 1978 (Haider, 2016). To provide a flexible and extensible framework for cataloging all types of content and media in the digital environment, a new cataloging standard named Resource Description and Access (RDA) was created by the same three organizations in 2010 (Haider, 2016). As a successor to AACR2, Resource Description and Access is a standard for descriptive cataloging providing instructions and guidelines on formulating bibliographical data for information resources in libraries and other cultural organizations (Haider, 2016; Resource Description and Access, 2021). RDA is based on the conceptual models of Functional Requirements for Bibliographic Records (FRBR), Functional Requirements for Authority Data (FRAD) and Functional Requirements for Subject Authority Data (FRSAD) developed by the International Federation of Library Associations and Institutions (IFLA) (Haider, 2016; Resource Description and Access, 2021; Tosaka & Park, 2013). The standard was implemented by the Library of Congress, British Library, and other major libraries in 2013 (Haider, 2016; Tosaka & Park, 2013).

Since its inception, many studies have been published on RDA in the literature of library and information science. Like many other fields, reviewing the published RDA literature is of great significance in understanding the status quo and research trends in this area. Although there

are different methods to evaluate scientific literature, bibliometrics has been commonly used to quantitatively analyze patterns arising in the publication and use of scientific literature (Diodato, 1994). However, a review of the RDA literature indicates that systematic and quantitative evaluations of the published RDA literature are scarce. The purpose of this paper is to provide a bibliometric analysis of the publications on RDA in library and information science literature from 2006 to 2020 using the visualization tool VOSviewer. Papers were retrieved from Web of Science and analyzed to obtain the quantitative bibliometric indicators and visual representations of the research on RDA in the specified period.

II. Review of literature

Bibliometric studies using VOSviewer have been conducted in various areas. Examples included environmental science and ecology (Duque-Acevedo et al., 2020), medical science (Huang et al., 2019; Belli et al., 2020), marketing (Park et al., 2021), digital humanities (Wang, 2018), computer science (Liu et al., 2021), data science (Liao et al., 2018), and science education (Effendi et al., 2021).

Despite the rapid growth of publications on RDA, evaluations of the published literature in this field are rare. Of special note was a comprehensive review of the current state of art in RDA by Tosaka and Park. Covering the emerging RDA literature from 2005 to 2011, the review provided a summary of the current RDA literature and focused more on areas of difference between RDA and AACR2, the relationship of RDA to other metadata standards, user studies in RDA, RDA testing, and RDA implementation and training issues (Tosaka & Park, 2013). In another review of cataloging and classification literature (2011-2012), Martin and Mundle explored RDA as a major theme of the literature reviewed. They explored the connection between RDA and FRBR, FRAD, and FRSAD, and elaborated on publications dealing with RDA implementation, training, testing, pros and cons of the RDA Toolkit, and divided views on RDA among the cataloging community (Martin & Mundle, 2014). Likewise, Cerrao and Castro (2020) conducted a literature review of FRBR, and RDA-based metadata applications in digital institutional repositories. They analyzed 25 documents to identify the current trends of the bibliographical domain of FRBR and RDA and their possible applications to digital institutional repositories. They concluded that computational technologies, use cases, and applications based on FRBR and RDA, such as Dublin Core, Bibframe, LIBFRBR, and RIMMF, stand out among the examples identified (Cerrao & Castro, 2020).

In addition to the review studies, there were two published bibliometric studies on the RDA literature. One focused on the productivity of the RDA literature from 2010 to 2014. Using *Library and Information Science Abstracts* and *Scopus* as its data sources, Machado and Pereira investigated the levels of RDA literature production in terms of publication years, authors, journals, and countries for the targeted period (2015). The findings include (1) scientific production of RDA was quite dispersed regarding authors and journals; (2) English was the dominant language in the publications; and (3) the United States was the country that published most in this field (Machado & Pereira, 2015). The other study surveyed the RDA literature published from 1997 to 2019, using the systematic mapping method (Machado & Zafalon, 2020). The data used for this study was extracted from nine sources, including Brazilian Digital Library of Theses and Dissertations (BDTD), Reference Database of Articles and Journals in Science of Information (BRAPCI), Library and Information Science Abstracts (LISA), Information Science & Technology Abstracts (LISTA), Networked Digital Library of Theses and Dissertations

(NDLTD), Scopus, and Web of Science. The study retrieved most publications on RDA from LISTA and analyzed and mapped the productivity and terms of the selected publications using StArt, Excel, and content analysis (Machado & Zafalon, 2020). Based on the retrieved terms, the bulk of the publications dealt with RDA in general, its implementation, transition, and testing (Machado & Zafalon, 2020). The current study also uses bibliometric method to analyze the RDA literature, but it is different from the above two bibliometric studies in the use of data source and methods of data collection and visualization. The objectives of the paper are to identify and analyze the most productive authors, journals, institutions, and countries as well as the most influential papers in RDA research from the LIS journals indexed in Web of Science, and to explore the major themes covered in the selected papers. As RDA is commonly implemented in libraries, this paper is significant in terms of finding publication and research trends and providing directions for future research and practice in this area.

III. Methods

The data for this study was retrieved from Web of Science core collection in the week of December 2, 2021. The terms “Resource Description and Access” and “RDA” were entered in the topic field for searching, with the Boolean operator OR inserted between them. Searching the topic field retrieves publications that contain the terms in the fields of title, abstract, author keywords, and keywords plus. As the term “RDA” is used in various disciplines to mean different things, especially in nutrition dietetics, environmental sciences, and ecology, the search was limited to the Web of Science category “information science & library science,” which is the area of interest for this study. The result of the search yielded a total of 395 publications. The search result was further limited to the document types “Articles” and “Review Articles,” obtaining a total of two hundred and seventy-seven publications. The time frame used for the study covered the period from 2006 to 2020, the earliest year available in Web of Science for the field. Afterwards, the titles, keywords, keywords plus, and abstracts of the publications were assessed for eligibility, resulting in ten publications removed. These ten articles were either remotely related to the subject or had the acronym “RDA” from different terms such as “Research Data Alliance.” Furthermore, nine articles in the form of book chapter were excluded. Finally, two hundred and fifty-eight journal publications were selected for the bibliometric analysis.

This study used bibliometric indicators to measure the productivity of the RDA publications in LIS literature, including the yearly publications, most productive authors, journals, institutions, and countries. The productivity of authors, institutions, and countries was calculated using the complete counting method which gave credit to all authors, institutions, and countries instead of just the first authors, institutions, and countries. Thus, a better description could be given to reflect the collaborations between authors, institutions, and countries. The study also used co-word analysis and co-citation analysis of cited references to infer the major themes of the published literature. Co-word analysis is a technique used to explore the interconnection between ideas represented through co-occurrence of words within subject areas in a corpus of texts (Callon et al., 1991; He, 1999; Law & Whittaker, 1992). Similarly, co-citation analysis is a bibliometric method used to map out the relationships between key ideas in a network of scientific literature. Co-citation is defined as “the frequency with which two items of earlier literature are cited together by the later literature” (Small, 1973). Two documents are co-cited if they are both cited together by another document. The more two documents are co-cited, the more likely they are related to each other in subject matter. Later, White and Griffith

innovated author co-citation analysis, focusing on co-cited sets of documents by authors (White & Griffith, 1981), and McCain (1991) experimented with journal co-citation analysis, using journals as the unit of analysis. The study used VOSviewer to visualize the literature.

IV. Results

The yearly distribution of the publications on RDA is shown in Figure 1. 2006 has the lowest number of publications (1) whereas 2016 has the highest output (34). The mean number of publications is 17.2 per year for the targeted period. A noticeable increase of publications is observed in 2012 with 26 papers. The publication pattern fluctuates since 2014.

Figure 1. Distribution of papers by year (2006-2020) n = 258

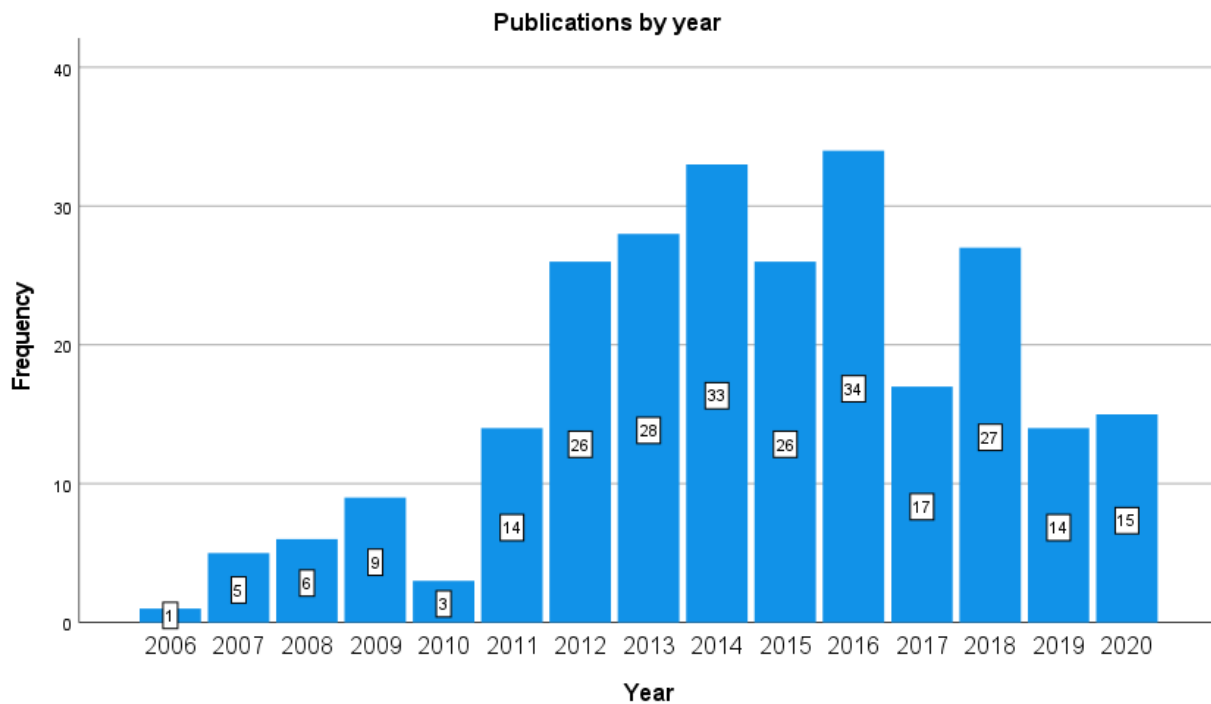


Table 1 shows the eighteen authors with a minimum productivity of three published papers among all authors. As shown, Guerrini was the most productive author (10 papers and 35 citations), followed by Bianchini (7 papers and 24 citations). Both authors are based in Italy and co-authored seven papers. Dunsire, Panchyshyn, and Taniguchi all published six papers with different citation scores (13, 26, and 22, respectively). McCutcheon, on the other hand, published four papers but had the highest citations/paper rate (6.75) among these authors.

Table 1. Most productive authors in RDA research in LIS journals from WoS, (2006-2020)

Name	Frequency	Total Citations	Cites/paper
Guerrini, M.	10	35	3.5
Bianchini, C.	7	24	3.42

Dunsire, G.	6	13	2.16
Panchyshyn, R.S.	6	26	4.33
Taniguchi, S.	6	22	3.66
Hider, P.	5	18	3.6
Howarth, L.C.	4	17	4.25
McCutcheon, S.	4	27	6.75
Santos, P.L.V.A.D.	4	2	0.5
Seikel, M.	4	17	4.25
Weihs, J.	4	17	4.25
Cakmak, T.	3	7	2.33
Danskin, A.	3	4	1.33
Lisius, P.H.	3	5	1.66
Pazooki, F.	3	5	1.66
Riva, P.	3	19	6.33
Rodriguez Garcia, A.	3	3	1
Tillett, B.B.	3	13	4.33

Table 2 shows the most productive institutions in RDA research from the selected papers. In counting the numbers of institutions' publications, the institutions with variant names were combined, such as University of Florence and University of Firenze, Kent State University and Kent State University Libraries. In terms of number of publications, University of Florence was ranked first (13), Kent State University second (12), and Library of Congress and Keio University third (8). Kent State University had the highest citation count (66), followed by University of Chicago (39), University of Florence (38) and Library of Congress (38) whereas Universidade Estadual Paulista and Universidade Federal de Sao Carlos had the lowest (2). Regarding citations per paper, University of Chicago and Kent State University were among the top two with the C/P scores of 7.8 and 5.5, respectively.

Table 2. Most productive institutions in RDA research in LIS journals from WoS, (2006-2020)

Institution	Frequency	Citations	Cites/paper
University of Florence	13	38	2.92
Kent State University	12	66	5.5
Library of Congress	8	38	4.75
Keio University	8	23	2.87
Charles Sturt University	5	18	3.6
Universidad Nacional Autonoma de Mexico	5	4	0.8
University of Chicago	5	39	7.8
University of Pavia	5	10	2
Hacettepe University	4	7	1.75
Oklahoma State University (Stillwater)	4	17	4.25
Technical Services Group (Toronto)	4	17	4.25
Universidade Estadual Paulista	4	2	0.5

Universidade Federal de Sao Carlos	4	2	0.5
University of Toronto	4	17	4.25

Table 3 lists the most cited papers (10 and more citations) from Web of Science. The article by Alemu et al. had the most citations whereas Tosaka & Park's article had the highest number of links. The average citation count of these papers was 14.9 and the average link count was 11.07. The papers were mostly about the relationships between RDA, FRBR, and FRAD, the relationship of linked data to RDA, the testing, training and implementation of RDA, and name authority issues in RDA.

Table 3. Most cited papers in RDA research in LIS journals from WoS, (2006-2020)

Title	Citations	Links
Alemu, G. et al. (2012). Linked data for libraries.	33	4
Billey, A., Drabinski, E., & Roberto, K.R. (2014). What's gender got to do with it?	20	4
Cronin, C. (2011). From testing to implementation: managing full-scale RDA adoption at the University of Chicago.	19	19
Hitchens, A. & Symons, E. (2009). Preparing catalogers for RDA training.	18	18
Baker, T., Coyle, K., & Petiya, S. (2014). Multi-entity models of resource description in the semantic web.	16	5
Bianchini, C. & Guerrini, M. (2009). From bibliographic models to cataloging rules.	14	6
Tosaka, Y. & Park, J.R. (2013). RDA: Resource Description & Access: a survey of the current state of the art.	14	30
Riva, P. & Oliver, C. (2012). Evaluation of RDA as an implementation of FRBR and FRAD.	13	12
Seikel, M. & Steele, T. (2011). How MARC has changed: the history of the format and its forthcoming relationship to RDA.	11	6
Moulaison, H.L. & Dykas, F. & Budd, J.M. (2014). Foucault, the author, and intellectual debt.	11	3
Hider, P. (2009). A comparison between the RDA taxonomies and end-user categorizations of content and carrier.	10	9
Kuhagen, J. A. (2011). Training for the U.S. RDA test.	10	9
McCutcheon, S. (2011). RDA testing in triplicate: Kent State University's experiences with RDA testing.	10	11
Maurer, M.B. & Panchyshyn, R.S. (2014). Understanding the why: a case study in managing the RDA implementation.	10	19

Table 4 lists journals that have published at least three papers. Fifty-six library and information science journals published papers on RDA in the targeted period in Web of Science. *Cataloging & Classification Quarterly* was the most productive journal with 92 papers, accounting for 35.6% of the 258 selected publications. The journal also had the highest citations (382). *Bibliotecas, E - Ciencias de la Informacion*, *Revista Ibero-Americana de Ciencia da Informacao* all published three papers without any citations. *Library High Tech*, *Cataloging & Classification Quarterly*, and *Knowledge Organization* were the top three journals in terms of citations per paper, with the scores of 6, 4.15 and 4, respectively. It is important to note that the 14 most productive journals published 203 papers, accounting for 78.68% of the total selected publications.

Table 4. Most productive journals in RDA research in LIS literature from WoS, (2006-2020)

Journal	Frequency	Citations	Cites/paper
Cataloging & Classification Quarterly	92	382	4.15
JLIS.IT	46	70	1.52
Library Resources & Technical Services	17	26	1.52
Serials Review	10	14	1.4
Technical Services Quarterly	10	34	3.4
Knowledge Organization	4	16	4
Anales de Documentacion	3	2	0.66
Bibliotecas	3	0	0
E - Ciencias de la Informacion	3	0	0
Information Research	3	2	0.66
Library Hi Tech	3	18	6
Revista Espanola de Documentacion Cientifica	3	11	3.66
Revista Ibero-Americana de Ciencia da Informacao	3	0	0
Zeitschrift fur Bibliothekswesen und Bibliographie	3	4	1.33

The most productive countries in RDA research of the selected papers are shown in Table 5. The United States published the largest number of papers (103) with 378 citations. Italy produced 27 papers with a citation count of 50. Spain took the third place with a total of 31 citations. Canada and Brazil both published 12 papers, with 11 citations for Brazil and 61 citations for Canada. In terms of citations per paper, the United Kingdom had the highest score (5.1), followed by Canada (5.08) and Australia (3.71).

Table 5. Most productive countries in RDA research from WoS, (2006-2020)

Country	Frequency	Citations	Cites/paper
United States	103	378	3.66
Italy	27	50	1.85
Spain	13	31	2.38
Canada	12	61	5.08
Brazil	12	11	0.91

United Kingdom	10	51	5.1
Germany	8	16	2
Japan	8	23	2.87
Australia	7	26	3.71
Mexico	6	4	0.66

As mentioned before, a co-word analysis was conducted to explore the major topics in RDA research from the selected papers. The unit of analysis was set to “All keywords” and the threshold was set to 5 occurrences of a keyword. These search criteria resulted in 38 keywords being selected for the map. The high frequency keywords with eight occurrences and above included “RDA,” “Resource Description and Access (RDA),” “Resource Description and Access,” “cataloging,” “cataloguing,” “FRBR,” “descriptive cataloging,” “linked data,” “metadata,” “semantic web,” “BIBFRAME,” “authority control,” “cataloging standards,” “catalogers,” “interoperability,” “training,” “MARC,” “ISBD,” “bibliographical description,” and “EURIG.”

Figure 2 illustrates the five clusters emerging from this analysis. The purple cluster, represented by keywords such as “RDA,” “cataloguing,” “implementation,” and “RDA implementation,” “EURIG,” was associated with the implementation of RDA. Of special note was the keyword EURIG (European RDA Interest Group), which was closely associated with the RDA implementation on the map, suggesting the focus of the articles related to the group. The blue cluster was composed of keywords “Resource Description and Access,” “Anglo-American Cataloging Rules,” AACR2,” “MARC21,” “cataloging,” and “resource description.” They indicated intricate relationships between resource description and access, cataloging, and Anglo-American cataloging rules and the current data format MARC21. The green cluster on the right-hand side of the map focused on the connections between RDA and related metadata standards, technologies, and bibliographical data models such as “MARC,” “linked data,” “RDF,” “RDFS,” “Bibframe,” and “semantic web.” MARC (Machine-Readable Cataloging) is the data standard that prescribes codes to describe elements of a catalog record in cataloging. It works with AACR21 and RDA to accommodate bibliographical data in its structure (Seikel & Steele, 2011; Tosaka & Park, 2013). Linked data is based on technologies such as RDF (Resource Description Framework), HTTP (Hypertext Transfer Protocol), URI (Universal Resource Identifier), RDFS (Resource Description Framework Schema), OWL (Web Ontology Language), and SPARQL (SPARQL Protocol and RDF Query Language) to publish and connect structured data on the web that can be read not only by humans but also by machines (Allemnag & Hendler, 2011; Berners-Lee, 2009; Bizer et al., 2011). The web of linked data is basically the semantic web (Semantic web, 2015). Bibframe is a data model designed to replace the MARC standards. It was initiated by the Library of Congress “for the future of bibliographical description, both on the web and in the broader networked world that is grounded in linked data techniques (Library of Congress, n.d.). The red cluster on the left-hand side of the map was essentially about the relationships between RDA and catalogers and cataloging in general. It included keywords such as “Resources Description and Access (RDA),” “Anglo-American Cataloging Rules (AACR2),” “descriptive cataloging,” “authority control,” “catalogers,” and “training.” The introduction of RDA to the existing cataloging framework based on Anglo-American cataloging rules inevitably brought forth the discussions on the cataloging practices and experiments with the integration and the training of the catalogers for the new standard. Finally, the yellow cluster, with keywords

of “FRBR,” “Functional Requirements for Bibliographical Records (FRBR),” “FRAD,” “ISBD,” “entity-relationships modeling,” and “bibliographical relationships,” centered on the relationships between RDA and FRBR-related conceptual principles. Figure 3 shows the temporal evolution of the themes demonstrating that metadata standards and technologies, especially linked data and Bibframe, received more attention in recent years.

Figure 2. Co-word analysis of RDA research in LIS journals with the threshold of 5 occurrences

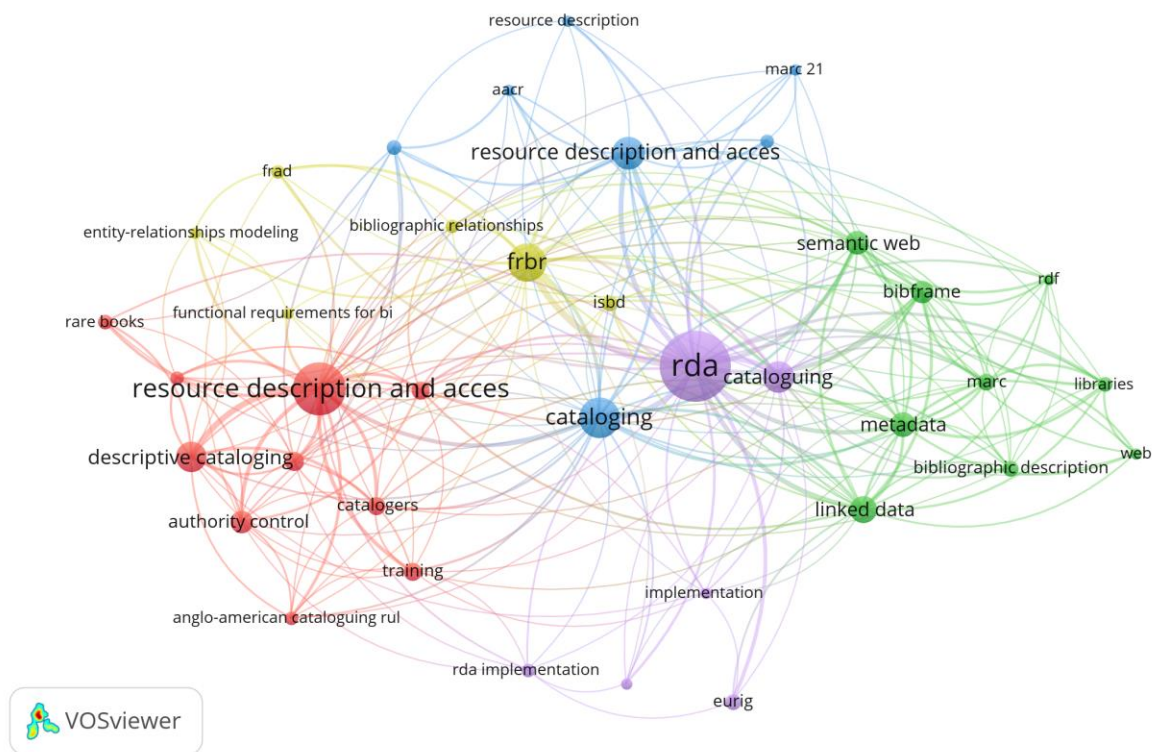
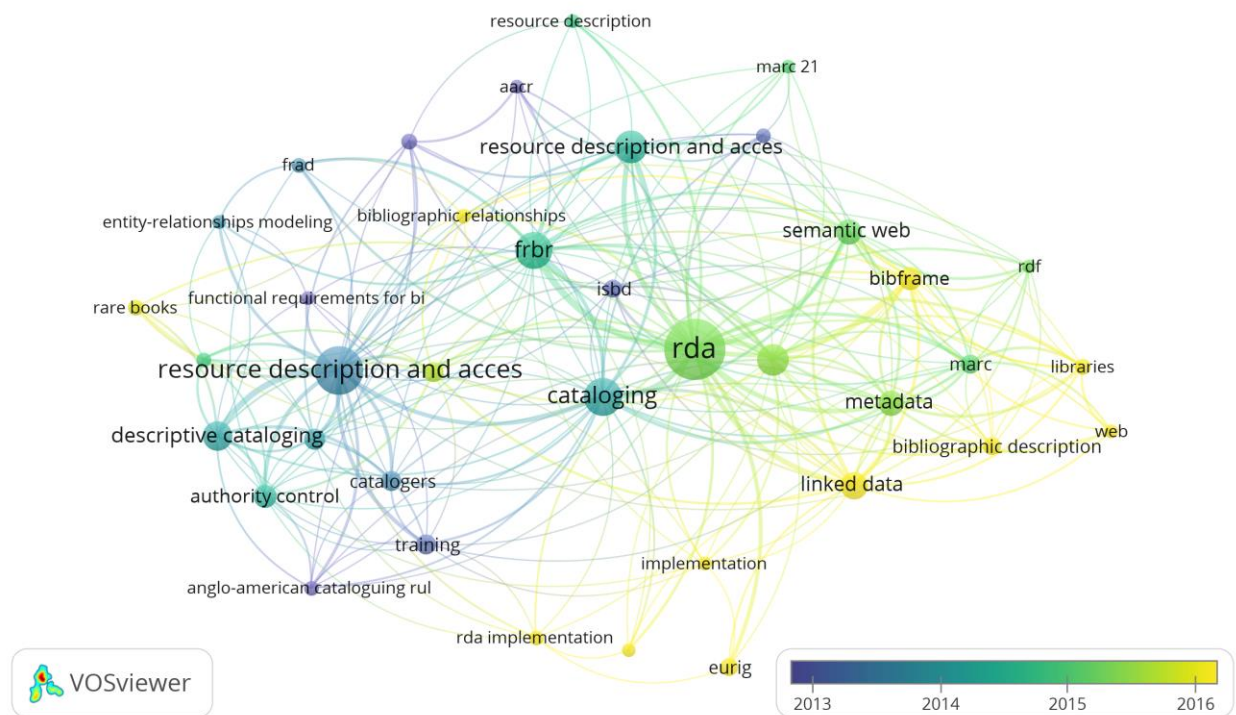
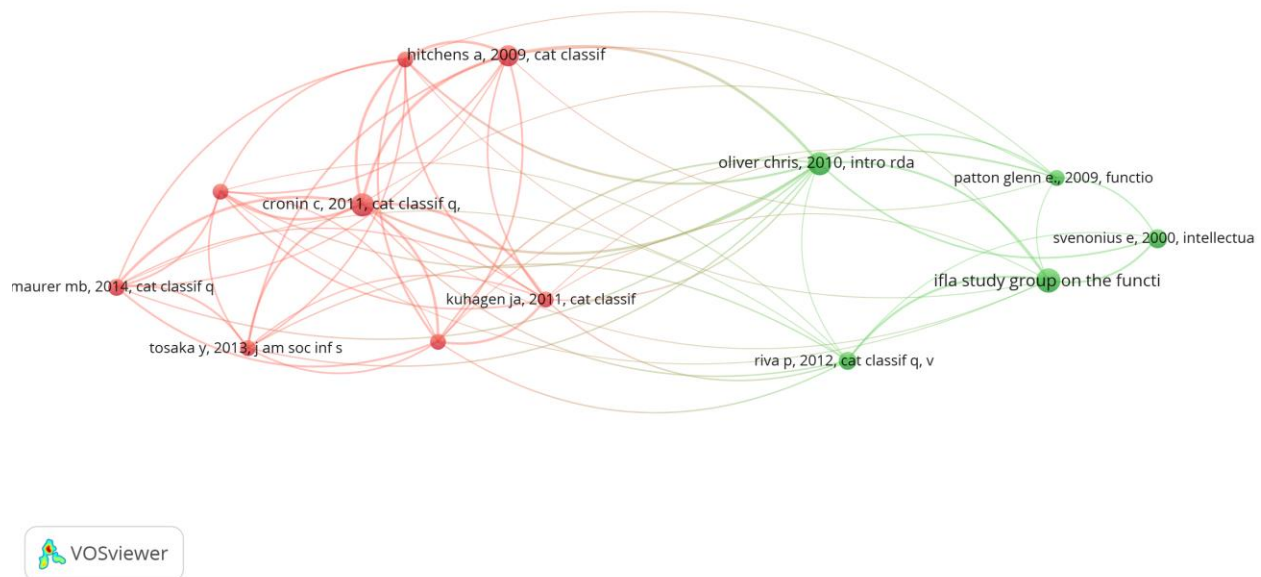


Figure 3. Temporal evolution of the themes on RDA in LIS journals (2006-2020)



In addition, as shown in Figure 4, a co-citation analysis of cited references was conducted to identify the underlying themes of the RDA research in the selected publications. The analysis set the threshold to at least nine citations and obtained 13 cited references with two clusters. Among the top co-cited references were IFLA Study Group (1998), Cronin (2011), Oliver (2010), Hitchens & Symons (2009), Svenonius (2000), Riva (2012), and Maurer & Panchyshyn (2014). The red cluster centered around the implementation of RDA, including testing and training. Maurer & Panchyshyn (2014) discussed in detail the RDA implementation process of Kent State University. RDA Testing, which was absent in the co-word analysis of this study, was examined by several studies (Cronin, 2011; Kuhlman, 2011; McCutcheon, 2011; Young, 2011). It was also extensively discussed in Tosaka's review article (2013). Two cited references were associated with training (Hitchens & Symons, 2009; Sanner, 2012). The green cluster was composed of articles on FRBR and cataloging principles in general. The conceptual model of FRBR was presented in the IFLA Study Group's report (1998), and the general principles were elaborated by other works in the cluster (Oliver, 2010; Patton, 2009; Riva & Oliver, 2012; Svenonius, 2000).

Figure 4. Co-citation analysis of cited references on RDA research in LIS journals with the threshold of 9 citations



V. Discussion

This study explored the productivity and citation patterns of authors, institutions, journals, and countries of the RDA research in LIS journals in Web of Science between 2006 to 2020. It further explored the themes emerging from the RDA literature through the cluster analyses. The descriptive analysis of the current bibliometric study of the RDA research in LIS journals indicated a temporal evolution of productivity that rose significantly in 2012, reached significant height in 2014 and fluctuated since then. The output surge can be partly explained by the fact that RDA was implemented in the year 2013 and the implementation may generate a greater research interest in the area around that time. In terms of authors' productivity, this study found that the 18 most productive authors contributed significantly to the total count of the occurrences of documents. This author productivity pattern indicates that a small number of authors published a relatively larger number of papers in this subject area. Similarly, this pattern also fits the institutions' productivity and countries' productivity. One characteristic of the institution productivity pattern was the diverse institutions from United States, Canada, Italy, Japan, Mexico, Brazil, Turkey. The United States was predominantly the most productive country in the RDA research in this study. Other most productive countries were from Europe (Italy, Spain, United Kingdom, Germany), North and South America (Canada, Mexico, Brazil) and Asian and Pacific region (Japan, Australia). With respect to the journal productivity, *Cataloging & Classification Quarterly* was the most productive journal with 92 papers, which was 35.6% of the total selected studies. Furthermore, the 14 most productive journals published 78.68% of the total papers among the 56 journals. It is also worth noting that half of the most productive journals publish articles in Spanish, Portuguese, Italian, and German.

The cluster analysis of the RDA research in this study revealed the themes in the literature. The co-word analysis identified five clusters: the implementation of RDA; RDA and current Anglo-American cataloging rules and data format MARC21; RDA and related metadata standards and technologies; RDA and catalogers and cataloging in general; RDA and FRBR, FRAD, and ISBD. Moreover, the document co-citation analysis complemented the above themes with two distinctive clusters—RDA testing, training, and implementation and RDA and FRBR-related conceptual principles. RDA testing was an important component of the RDA implementation. Its absence in the clusters of the co-word analysis could be due to its low occurrences in the keywords. An examination of the authors' supplied keywords and keyword plus showed that the keyword occurred only three times there. In contrast, RDA-related word "test/testing" occurred nine times in the titles. The findings about the RDA themes in this study were in line with those discussed in Tosaka and Park's study (2013), which identified major themes in the RDA literature as AACR2, FRBR and RDA, RDA and related metadata standards, RDA and users' perceptions, RDA testing, RDA and cataloging community's responses, and RDA implementation and training. Some of these themes were also discussed in the previous studies, such as RDA testing, training, and implementation (Machado & Zafalon, 2020; Martin & Mundle, 2014), catalogers' response, RDA and AACR2, RDA and FRBR, FRAD (Martin & Mundle, 2014).

The contributions of this study can be summarized as follows: First, it provided a systematic bibliometric analysis of the productivity trends of authors, institutions, journals, countries in RDA research through the data obtained from LIS journals in Web of Science—one of the most influential publication and citation databases. Second, it identified and visualized the themes in RDA literature through the quantitative methods of co-word analysis and document co-citation analysis. Third, through the more comprehensive quantitative method and visualization, it identified a new trend in recent years in the RDA research, namely, the incorporation of the related metadata standards and technologies, especially the linked data, Bibframe and semantic web while reinforcing the themes in RDA literature found in the previous studies.

Several limitations for this study need to be mentioned. First, the bibliometric analysis of the RDA research was limited to the data collected from Web of Science, which is one of the most popular bibliometric databases and has journal selection criteria of its own. Valuable journal articles on RDA research not indexed by Web of Science were not included in this study, especially those published in the non-Western languages. Second, to get more consistent results, this study was limited to articles and review articles only, excluding conference proceedings, book chapters and other document types. Third, as a bibliometric analysis and visualization of the RDA research based on quantitative data, this study is not meant to replace other approaches to this subject such as content analysis and literature review.

VI. Conclusions

This study presented a bibliometric analysis of the productivity of authors, institutions, journals, and countries and the major themes of RDA research found in LIS journals in Web of Science. The exploration of the authorship and publication patterns in terms of authors, institutions, journals, and countries calls for a more diverse participation in RDA research, especially by authors and institutions from non-Western countries. The study identified several themes in RDA research through the co-word analysis and document co-citation analysis: RDA

implementation, testing, and training, RDA and other emerging metadata standards and technologies, RDA and FRBR-related conceptual models, RDA and ACCR2, and library community's RDA. It is most likely that future research may continue to focus on these directions, especially the RDA cataloging in the linked-data environment. Lastly, future studies on RDA research using the bibliometric and visualization methods may also use other publication and citations databases such as Scopus or Dimensions to compare the findings of this study.

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