

Investigating the Challenges in Implementing the Resource Description and Access (RDA) in Bibliographic Records and Library Software

Hassan Mantegh

Ph.D. Student in Information and Knowledge Management, Tarbiat Modares University, Tehran, Iran.

hassan.mantegh@yahoo.com

ORCID iD: <https://orcid.org/0001-7653-1471>

Leila Jabbari

Ph.D. Student in Information and Knowledge Management, Tarbiat Modares University, Tehran, Iran. Corresponding Author: le_jabbari@yahoo.com

ORCID iD: <https://orcid.org/0000-0002-0374-6364>

Atefeh sharif

Assistant Prof. Department of Knowledge and Information Science, Tarbiat Modares University, Tehran, Iran.

Sharif.atefe@gmail.com

ORCID iD: <https://orcid.org/0003-4761-6761>

Received: 25 November 2023

Accepted: 25 July 2022

Abstract

This paper examines the challenges in implementing the Resource Description and Access in bibliographic records and library software. To meet this end, a survey approach was employed, and a questionnaire was used to collect the data. The statistical sample size was determined as 95 librarians from Tehran University, 48 librarians from Allameh Tabataba'i University, and 35 librarians from Tarbiat Modares University. According to the results, the respondents believe that the main problems for implementing RDA in academic libraries in Iran are, in turn: "problems in switching to new library software", "problems of not having enough information and knowledge to implement RDA", "problems in the internal communication of libraries", "data incompatibility", "lack of a trustee to apply the RDA rules", and "problem with library users". Therefore, using a correspondence table and designing a comprehensive manual in library software is needed to guide the librarians and catalogers in implementing RDA.

Keywords: Resource Description and Access, RDA, Library Software, Academic Libraries, Bibliographic Records, Resource Description.

Introduction

The Resource Description and Access (RDA) is a new standard designed to describe and access a variety of sources. This standard was introduced in 2009 to replace Anglo-American cataloging rules. RDA is a new generation of cataloging code designed for digital resources, but it can be used to describe all types of resources, including digital and online resources (Kiogaard, 2009). This standard is designed for all people who need to find, identify, select, access, use, manage, and organize information; it, therefore, covers all resources and is independent of any communication format.

Chapman (2006) believes that the Joint Steering Committee designed the RDA for Revision of AACR (JSC) to create an international standard as well as better coordination and

communication with new database technology. The origin of the RDA rules is Anglo-American rules, but they are easier to use, more flexible, and more cost-effective than Anglo-American rules. The RDA is structured in such a way that individuals can easily identify and apply basic guidelines. These standards are generally designed and developed in ten sections, each of which is in several chapters. The first part covers the description of resources; the second part covers the communication and control of retrieval indicators (Danesh, Afshar & Nouri, 2006).

In its structure, RDA uses the Fictional Requirements for Bibliographic Records (FRBR) and related conceptual models, namely Functional Requirements for Authority Data (FRAD) and Functional Requirements for Subject Authority Records (FRASAR). In RDA rules, the entities and relationships between entities of these abstract models are used.

Expanding the conceptual model of FRBR and RDA is rooted in user-friendly approaches. Based on these approaches, the library catalog should support the functions expected by users. In other words, when the user interacts with the library catalog and its records, he can discover, identify, select, and access the content objects of his choice. These functions are performed by the elements (attributes or fields) of the metadata design used in the catalog. Metadata elements provide various functions by describing objects and communicating between them. Replacing the RDA standard, which has been developed based on the FRBR conceptual model, with Anglo-American cataloging rules is another achievement. This means that the attitude of the FRBR model, in addition to the level of metadata records, has also affected the level of descriptive guidelines (Hariri, Bakhtiari, Babolhavaeji & Taheri, 2013).

On the other hand, library software for organizing and managing information must be flexible and constantly changeable and be able to adjust to the developments in the field of information technology. Flexibility is one of the most important features of the current library software (Taheri, 2009). Implementing RDA requires the development of special arrangements and capabilities in the computer catalog and library software that are directly related to the flexibility of these tools. By implementing RDA rules, many weaknesses and shortcomings of Anglo-American cataloging rules in the new information environment can be eliminated (Moradi & Haji Zeineh Al-Abedini, 2011), and upgraded computer catalogs and library software to retrieve information. Meeting the new expectations and needs of users has also made it necessary to use conceptual templates such as RDA in the design of library software and computer catalogs.

More than two decades have passed since the emergence of library software in Iran. During this period, organizations and companies providing this software have tried to keep pace with developments in the field of information management with the cooperation and participation of experts in the field of librarianship and information science. Holding various workshops and conferences by these companies or organizations on FRBR conceptual models shows their desire to solve problems and implement these models. Implementing RDA can add more value to library software. However, implementing this template in Iranian catalogs and library software has challenges and problems.

Due to its novelty, RDA has not yet been used operationally at the library level, and it needs to be seriously identified and considered by libraries, as it now replaces existing Anglo-American rules in many large libraries, including the Library of Congress, and is used to organize resources. It is also necessary to make improvements to the library's catalogs and software to keep pace with the new changes. The new rules will mainly affect the three sections "Information Entry, Software Structure, and Information Retrieval and Display" in computer

catalogs.

In the case of implementing the RDA standard, in the data entry section of library software, which is the basis of cataloging, the pattern of functional requirements of bibliographic records (FRBR) is necessary, as well as the relationships between bibliographic components. In the field of structure, retrieval, and display of information, RDA principles using FRBR features will be able to provide a good description of sources and display and appropriately make available bibliographic information. Since one of the features of RDA is its compliance with Anglo-American rules (Moradi & Haji Zain Al-Abedini, 2011). Changing cataloging rules: The Description and Access to Resources (RDA) standard replaces the Anglo-American cataloging rules. *Journal of Library and Information Science*, 14(1), 269-296. [in Persian]), cataloging worksheets are expected to be used in library software for the description of resources in the new environment with minor changes (Pazouki, Haji Zein Al-Abedini & Arastoopoor, 2013).

On the other hand, the lack of real knowledge of librarians and catalogers with library standards is also an issue. The results of previous research (ibid) showed that the actual knowledge of library catalogers is below average. The information resources on the web are increasing every day, but it seems that search engines are not able to retrieve these resources fully. Regarding this issue, the role of information organization methods becomes more important. RDA can improve the organization of such resources, whereas the implementation of RDA itself can also have challenges. To overcome the challenges, first, it should be identified whether the library catalogs and systems are ready to accept RDA implementation in their cataloging layers. Then, the essential measurements that librarians and catalogers need to take should be determined. To identify the challenges of RDA implementation and provide solutions for it, the current paper studies the challenges of RDA implementation in bibliographic records and library systems by asking the academic librarians in three different universities (University of Tehran, Tarbiat Modares University, and Allameh Tabataba'i University).

Research questions

1. To what extent do librarians consider it necessary to use the RDA standard instead of the Anglo-American rules?
2. In the opinion of librarians, what are the necessary changes to implement the RDA standard in bibliographic records?
3. In the opinion of librarians, what are the necessary changes to implement the RDA standard in library software from librarians' opinions?
4. What do librarians consider to be the most important major challenges in implementing RDA?

Literature Review

Numerous studies have been done or are being done on the RDA standard in recent years. Here are some examples.

Khasseh (2010) has conducted a study while briefly reviewing the strengths and weaknesses of Anglo-American cataloging rules 2, the standard is described, the source access (RDA) is introduced, and its main goals and features are pointed out. Features of this standard include compatibility with Mark 21, Dublin Core, FRBR, and FRD.

Moradi (2010) first tried to identify the state of descriptive cataloging of digital libraries, which was created based on the Anglo-American Cataloging Rule, and detect its

correspondence with the RDA standard. The results of the study showed that the existing data from digital bibliographic records did not fully correspond with available standards and rules. It was also found that the equivalence relationship and derivative relationship are frequently used, while the accompanying relationship and sequential relationship are rarely used. According to the results, there is a significant difference between the relationships used in digital libraries in equivalence, derivative, descriptive, whole-part, and sequential relationships. However, no significant difference was detected between the usage of accompanying relationships in the digital bibliographic record. The correspondence of the characteristics of the entities of work, expression, manifestation, and item based on the Resource Description and Access (RDA) Standard with the available descriptive data in bibliographic records in digital libraries demonstrated that most characteristics defined in the entities of work expression and item were not present in the records. There is also little accordance in entities of manifestation.

Pazouki (2013) examined the feasibility of implementing RDA in the National Library of Iran and identified the correspondence rate of bibliographic records in RASA RDA software. According to the results, more than 88% of records matched with RDA. To determine whether the National Library of Iran cataloguers are familiar with RDA, the researcher directly asked the respondents. Their real level of familiarity was evaluated by open questioning before and after the training. The finding showed that before participants were trained, their familiarity with RDA was at a moderate level. However, after training, when they were asked again about their familiarity and when they were evaluated, it was confirmed that they gained higher familiarity with RDA. Respondents with master's degrees were more familiar with standards than those with bachelor's degrees. Overall, the study showed that the level of readiness in cataloguers for RDA implementation was higher than moderate.

Pazouki et al. (2013) investigated the application of the rules of RDA. The results showed the compliance of more than 88% of the data in the bibliographic fields with the RDA. In this study, the problems in bibliographic records were divided into four groups: 1- typing and spelling, 2- not inserting information in the correct fields, 3- cataloging (Anglo-American), and 4- not entering information (Negligence). In this study, the problems of non-compliance with RDA, with a frequency distribution of 47.07%, had the highest frequency distribution.

Jahanshahi, Rezaei Sharifabadi and Karbala (2013) studied the applicability of RDA in the Library, Museum, and Document Center of Iran's Parliament. The statistical population of this study included 156 elements of cataloging historical documents. To achieve the objectives of the research, only 56 out of 156 descriptive elements were examined. According to the research findings, the level of correspondence between the cataloging worksheet for the historical documents and the elements of RDA is only 22.1%. The results of the research showed that the cataloging worksheet of historical documents pays more attention to systematic and analytical (thematic) discussion, and the number of its descriptive elements is much less. RDA has more comprehensive coverage for the descriptive cataloging of archival sources than the index for cataloging historical documents in the Library, Museum, and Document Center of Iran's Parliament. Moreover, the Documentation Center of Iran's Parliament for Improving the description and organization of its resources can include 49 suggested elements derived from the core elements of RDA's resources.

Rakhshani, Nokarizi and Haji Zainal Abedini (2014) described the Internet resources in RDA in comparison with the Anglo-American cataloging rules". The study population was the

descriptive areas of Chapters 1, Chapter 9, and Chapter 12 of the latest edition of the Anglo-American Cataloging Rules (2002 edition, updated 2004) and the descriptive elements of Chapters 1-7 of the RDA Rules. The findings show that there is no difference between the full title of Anglo-American cataloging rules and RDA rules. The three elements (media type, format type, and content type) in RDA rules have replaced the general material identifier in Anglo-American cataloging rules. There is a spelling difference between Anglo-American cataloging rules and RDA rules regarding liability description, editing description, size, place of publication, publisher name, date of publication, series, and notes. Elements of access conditions, access restrictions, usage restrictions, system requirements, content summary, content-language, contact information, and URL are the new elements of cataloging in RDA rules. The results showed that the rate of adaptation of Internet resource description areas in Anglo-Americans compared to the elements of Internet resource description in RDA is 71.87%.

Keeping pace with international efforts with an emphasis on the operating perspective of the Library of Congress to implement RDA standards in Iran was examined by Pazouki (2013). Emphasizing the role of the Library of Congress as a pioneer in this field, this article uses an analytical and historical approach to express the reasons, contexts, and trends of changing cataloging rules in the world, and in following, he describes the actions of the Joint Strategic Committee and the Library of Congress as trustees. Based on the research findings, the standard of RDA for descriptive cataloging of information resources in the new environment has been presented, and various libraries around the world have put their replacement with Anglo-American rules on their agenda.

Bagherifar and Mousavi Chelak (2017) studied the compatibility of RDA rules with works related to Shahnameh. They found that RDA rules are 91.66% compatible with selected works of Shahnameh and works describing Shahnameh. Also, 90.9% of RDA rules are compatible with the translation of selected works of Shahnameh and the description of this book. In summary, 90% of RDA rules are compatible with studied records. However, the existing bibliographic records in the National Library of Iran are not complete. Deficits should be removed to implement RDA rules.

Pazouki et al. (2013) studied the Iranian Catalogers' opinions on RDA and the level of accepting them in the National Library and Archives of Iran. The statistical sample of the research was 49 cataloguers of the National Library, and the data collection tool was a questionnaire. The questionnaire was distributed among cataloguers and collected in two stages before and after the RDA training workshop. The results showed that the catalogers in the pre-training stage, using self-reporting, determined their level of familiarity with the RDA rules above the average level, while after the training, they considered their real familiarity with RDA to be much lower. In addition, among cataloguers, there was a significant difference between the variables of demographic and self-reported characteristics and the degree of actual familiarity with the acceptance ratio. In general, the results of the research confirmed the existence of a significant difference between self-reporting and the degree of real knowledge of catalogers of RDA rules.

Another study done by Mozafari, Haji Zineh Al-Abedini and Pazouki (2017) examined the degree of compliance of the National Library of Iran with the standard of RDA. Findings showed that 14.7% of the data in the studied records are in full compliance with RDA elements, and 83.5% are not in compliance with these elements. The implementation of RDA in the Agricultural Research Education & Extension Organization was examined by Shahmirzadi,

Hajizineh Al-Abedini, and Pazouki (2019). In this research, 210 Persian bibliographic records on the subject of agriculture entered into Simorgh software of the Agricultural Research, Education, and Extension Organization were examined. The results showed that “having differences with RDA rules” with a frequency of 45.56%, then “typing and spelling” with 33.75%, “negligence in entering information” with 21%, “cataloging” (Anglo-American) “with 8.01 percent, and” inserting information in the wrong areas “with 3.79 percent are the main problems. The results of this study provide a good basis for planning to use RDA.

Miksa (2009) conducted a study entitled “Standard of Resource Description and Access to Research Resources and New Capabilities”. In this study, Miksa states that the primary purpose of the new rules is to facilitate the discovery of resources through library catalogs more powerfully and consistently than the Anglo-American cataloging rules. To understand the new rules, it is necessary to recognize the concept of patterns of functional requirements of bibliographic records (FRBR) and functional requirements of documentary data (FRID). The two models developed by IFLA act as a framework for RDA.

Caesar and Eichel (2009), in a study entitled "Challenges of Implementing the RDA: A Case Study in Germany," used RDA as a substitute for German cataloging rules and Anglo-American cataloging rules, 2nd Edition in 2011 (Pazouki et al., 2013). Gadelrab (2010) pointed to the need to train librarians to use RDA in his research. While examining the level of their familiarity with RDA, he also categorized the opinions expressed about RDA and finally suggested solutions to apply it. Sanchez (2010) examined the attitude of cataloguers towards RDA rules and their familiarity with these rules and the Semantic Web. The results showed that librarians with less knowledge were more concerned with applying RDA rules (Welsh & Batley, 2012; Rakhshani, et al., 2014). Morris and Wiggins (2016) studied the implementation of this standard in the Library of Congress. Their results showed that RDA implementation can provide more flexibility in organizing information. It shares cataloging data more easily internationally and is more suitable for describing digital and non-printed library resources (Shahmirzadieh et al., 2019).

El-Sherbini (2018) investigated the RDA implementation and the development of BIBFRAME. She stated that RDA development has revealed Marc's 21 weaknesses in the bibliographic description. Library of Congress developed BIBFRAME to replace Marc 21. In summary, this paper highlighted the role of BIBFRAME in overcoming the Marc 21 shortcomings. Banfi and Gaudinat (2019) examined the experiences gained from fundamental changes in the records because of applying new standards such as RDA and FRDA in public libraries in Switzerland. This article is a study of the Geneva City Library Network, which investigates the current status of public libraries in Switzerland on the subject of "bibliographic change" as a case study using semi-structured interview tools. Research findings show that in Switzerland, the federal and multilingual structure of the public library network has increased organizational barriers to implementing new cataloging rules and formats. At the local level, municipal libraries in Switzerland need to cope with this complexity, to be restructured, and to continue to provide competitive and effective services to users. In general, the results of this study showed how to apply conceptual and technological innovations in the face of organizational and administrative constraints, especially in the case of public libraries (lenders).

Fernandez and Cabonero (2020) identified the level of knowledge and skills of academic librarians in using RDA in Nueva Vizcaya. Their findings revealed that librarians' knowledge and skills in recording the attributes of manifestation and item, works and expressions, and

recording the relationship of families and corporate bodies are not at a high level. Another finding of this research showed that younger librarians with bachelor's degrees seem to be more knowledgeable and skilled in using the RDA and recording the mentioned attributes. This study concluded that librarians' skills and knowledge in using RDA, which is based on FRBR, are limited. Therefore, librarians need to learn the required knowledge and skills to utilize the RDA. Focusing on Nigerian academic libraries, Nwachi, Ihekwaaba, and Nwafor (2021) examined the problems of implementing RDA in library catalogs. They claimed that to overcome the cataloging problems in implementing RDA, libraries need technical equipment and skilled librarians. Also, adequate funding must be allocated to the libraries, librarians must be trained, infrastructure must be provided, and support from managers and directors must be sought.

Table 1 summarizes the key findings of the reviewed literature. The related study demonstrated that various studies have been conducted on the RDA pattern. Researchers such as Pazouki (2013), Shahmirzadeh et al. (2019), Benfi and Godinat (2019), Fernandez and Cabonero (2020), Nwachi et al. (2021) and Caeyssar and Dierk (2009) tried to study prerequisites and essential background for the implementation of RDA. Some Research has been done out of Iran, especially in the Library of Congress (Morris & Wiggins, 2016) as well as domestically and with a focus on the National Library (Pazouki, 2013; Pazouki et al., 2013), Library of the Museum and the Islamic Consultative Assembly (Jahanshahi et al., 2013), and in the Agricultural Research, Education and Extension Organization (Shahmirzadeh et al., 2019). In the meantime, there is a gap in research related to Iranian university libraries in the field of RDA standards. In general, the study of internal and external literature reviews indicates that so far, no research has been done in this field, especially about the challenges in the university's central libraries, which have several central, faculty, and specialized libraries

Table 1

The key findings of the literature review

Researchers	Main Topic of The Study	Results
Pazouki (2013)	Feasibility study on the use of RDA considering the thoughts of National Library of Iran librarians	1-More than 80% of bibliographic records were compatible with RDA 2-The rate of librarians' real familiarity was less than average, but both their real familiarity with RDA and their expression of familiarity with RDA increased after receiving the training.
Pazouki et al. (2013)	Analyzing the status of bibliographic records of Iran's National Library	Problems facing bibliographic records were categorized into four types: 1. Typing and Spelling errors 2. Entering information into the wrong fields 3. Cataloging (Anglo-American) errors 4. Not entering the information (due to negligence)
Jahanshahi, et al. (2013)	Applicability of Resource description and accessibility (RDA) in the library, museum, and documentation center of the Islamic Consultative Assembly	Only 22.1% of this library's catalogs are compatible with RDA's core elements.

Researchers	Main Topic of The Study	Results
Pazouki et al. (2013)	Keeping Up with International Efforts in Using Resource Description and Accessibility (RDA) in Iranian Libraries, Emphasizing the Operational Perspective of the Library of Congress	RDA is presented to describe and catalog information resources in the new environment. Libraries around the world have planned to use it as a replacement for Anglo-American rules.
Bagherifar & Mousavi Chelak (2017)	Analyzing the compatibility of RDA rules with related works (Shahname as the case study)	Current records in Iran's national bibliography are incomplete and deficient. To implement RDA, the records should be completed and the errors and deficiencies must be corrected.
Pazouki et al. (2014)	National Library and Archive of Iran Catalogers' opinion about RDA and evaluating their acceptance.	Before receiving the training, catalogers expressed that their familiarity with RDA was more than average, while after the training, they expressed that their real familiarity with RDA was much less.
Mozaffari et al. (2017)	Compatibility of Iranian National Library and Archive Center periodicals list with RDA standards	Results showed that 14.7% of examined records are fully compatible with RDA, while 83.5% of them are not.
Shahmirzadi et al. (2019)	Implementing RDA in Agricultural Research Education and Extension Organization	Being different from RDA was the first problem facing the RDA implementation in the organization (45.56%), problems in typing and spelling (33.75%), negligence in entering the data (21%), cataloging according to the Anglo-American rules (8.01%), and entering data in incorrect fields (3.07%) were amongst the other problems in RDA implementation.
Miska (2009)	Resource Description and accessibility standard and new research capabilities	To understand the RDA rules, it is essential that the FRBR and FRAD first be known.
Gadelrab (2010)	Training librarians to make use of RDA	The level of librarians' familiarity with RDA and their opinions towards it were categorized, and solutions for RDA implementation were presented.
Sanchez (2010)	Catalogers' approach towards RDA and the level of their familiarity with these rules and semantic web	Librarians with less knowledge about RDA feel less confident.
Morris & Wiggins (2016)	RDA implementation in the Library of Congress	RDA facilitated international access to cataloging data. Also, it is most appropriate for describing the digital and non-print resource.
El-Sherbini (2018)	RDA implementation and BIBFRAME emergence	RDA development, the issues facing Marc 21, and the role of BIBFRAME in dealing with such issues are discussed
Fernandez & Cabonero (2020)	Identification of academic librarians' knowledge and skills in using RDA	1. Academic librarians have limited knowledge and ability to use FRBR and RDA. 2. Librarians need to be trained to increase their knowledge and skills in cataloging using

Researchers	Main Topic of The Study	Results
		RDA.
Nwachi et al. (2021)	Challenges of implementing RDA in library catalogs with an emphasis on academic libraries	Technical equipment, professional catalogers, financial sustainability, catalogers training, infrastructure provision and maintenance, corruption elimination, and managers' support are some solutions for dealing with the RDA implementation issues.

Materials and Methods

The present study is applied in terms of purpose, which is done using a survey method. In this research, a researcher-made questionnaire is used to collect data. Also, the statistical population of the study was all librarians of Tehran University (125 people), Tarbiat Modares (35 people), and Allameh Tabatabai (54 people). Using Cochran's formula, the statistical sample size of librarians at the University of Tehran was 95, and Allameh Tabatabai University librarians were 48. Also, due to the small statistical population of librarians at Tarbiat Modares University, the census method was used.

Related and similar researchers, such as Caesar and Eichel (2009) and Godelrab (2020), were used in designing the questionnaire. The questionnaire was designed with 13 items on a 5-point Likert scale (strongly agree, agree, have no opinion, disagree, and strongly disagree), and after collecting the questionnaires, SPSS 23 statistical software was used to analyze the information. Cronbach's alpha coefficient was used to measure the reliability of the research instrument. The alpha coefficient of the questionnaire was equal to 0.882, which, due to its higher value than 0.7, it was concluded that the reliability of the assessment tool is also desirable and appropriate.

Moreover, to assess the validity of the measuring instrument, the method of structural validity and KMO¹ and Bartlett tests were used. The test results are given in Table 2.

Table 2

Validity test results of the assessment tool

No. of items	Bartlett's Test (significance level)			KMO
13	Bartlett's Test of Sphericity	Approx. Chi-Square	2508.990	0.729
		Df	78	
		Sig.	0.000	

As can be seen in the table, KMO is 0.729, and the significance level of the Bartlett test is 0.000 ($P \leq 0.05$). Therefore, it can be concluded that the developed questionnaire has a suitable and desirable validity.

Results

Descriptive findings

The results of the frequency distribution of the respondent's gender and their level of education are presented in Table 3.

Table 3
The frequency distribution of the respondents' gender

	Universities					
	Tehran		Tarbiat Modares		Allameh Tabataba'i	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
woman	67	70.5	27	77.1	26	54.2
man	28	29.5	8	22.9	22	45.8
Total	95	100	35	100	48	100

The results in Table 3 show that 70.5%, 77.1%, and 54.2% of the respondents of Tehran University, Tarbiat Modares University, and Allameh Tabatabai University are women, respectively. Also, 29.5%, 22.9%, and 45.8% of the respondents of Tehran University, Tarbiat Modares, and Allameh Tabatabai University are men, respectively. Table 4 illustrates that 68.5% of the respondents had a bachelor's degree, 26.4% had a master's degree, and 5.1% had a Ph.D. degree.

Table 4
Frequency distribution of respondents' educational degree

Degree	Frequency	Percent
BA	122	68.5
MA	47	26.4
Ph.D. and higher	9	5.1
Total	178	100

Inferential findings

RQ 1: How essential is it to use the RDA standard instead of the Anglo-American rules from librarians' viewpoints?

In this study, four items were designed and used to answer the first question. The frequency distribution of items related to the first research question is given in Table 5.

Table 5
Frequency distribution of the answers to the items of the first question

Options Items	Definitely Agree		Agree		No Idea		Disagree		Definitely disagree	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
I am fully acquainted with the RDA standard.	33	18.5	30	16.9	95	53.4	20	11.2	-	-
It is now possible to use RDA in the library.	95	53.4	44	24.7	6	3.4	33	18.5	-	-
RDA is more facilitator than just Anglo-American rules.	101	56.7	62	34.8	15	8.5	-	-	-	-
I think using RDA is useful for the library.	18	10.1	94	52.8	66	37.1	-	-	-	-

As can be seen in Table 5, only 35% of librarians were fully acquainted with the RDA standard, and conversely, 20% of respondents were not familiar with this standard. 53.4% of the other respondents did not have a specific opinion about it, and it can be said that they did not know about this standard. Regarding the second item, a total of 78% of the librarians consider it possible to use RDA in libraries at present, while 18.5% of them consider the impossibility of the use of RDA in the library. Also, concerning the third item, a total of 91% of the respondents consider the RDA standard to be more helpful than the Anglo-American rules. Regarding the fourth item, a total of 63% of respondents consider the use of the RDA standard to be beneficial for libraries.

RQ 2: From the librarians' point of view, what are the necessary changes to implement the RDA standard in bibliographic records?

Five items were used to answer the second research question. Table 6 shows the frequency distribution of items related to the second research question.

Table 6

Frequency distribution of the answers to the items of the second question

Options Items	Definitely Agree		Agree		No Idea		Disagree		Definitely disagree	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
To use RDA, it is first necessary to correct the mistakes and errors in records (in terms of cataloging).	52	29.2	115	64.6	11	6.2	-	-	-	-
To use RDA, it is necessary to check the technical conditions of the records (in terms of editing).	38	21.3	129	72.5	11	6.2	-	-	-	-
Providing core information (based on RDA) is necessary to facilitate the cataloging process.	47	26.4	110	61.8	21	11.8	-	-	-	-
To automatically apply changes, it is necessary to correct inconsistent data in the records.	71	39.9	45	25.3	62	34.8	-	-	-	-
Logical communication of records is necessary for designing data-relational structures and functional models.	75	42.1	87	48.9	16	9	-	-	-	-

The results of Table 6 about the first item show that a total of 94% of respondents believe that to apply the RDA standard, it is necessary to correct erroneous records (in terms of cataloging). Concerning the second item, a total of 94% of the respondents consider it necessary to check the technical condition of the records (in terms of editing) to use RDA. To the third item, a total of 88% of the respondents consider it necessary to provide RDA-based core information to facilitate the cataloging process. With the fourth item, from the point of view of the majority of respondents (65% in total), it is necessary to correct inconsistent data in the records to apply the changes automatically. Also, a total of 91% of the respondents considered the logical connection of backgrounds necessary for designing data-relational structures and

functional conceptual models.

RQ 3: In the opinion of librarians, what are the necessary changes to implement the RDA standard in library software?

Three items were used to answer the third research question. Table 7 shows the frequency distribution of items related to the third research question.

Table 7

Frequency distribution of the answers to the items of the third question

Options Items	Definitely Agree		Agree		No Idea		Disagree		Definitely disagree	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1- It is necessary to use the help options in the appropriate number and for each field separately in the library software.	43	24.2	120	67.4	11	6.2	4	2.2	-	-
2-Predicting the possibility of changing the software structure according to the needs of each library.	47	24.4	107	61.1	24	14.5	-	-	-	-
3- It is possible to use the RDA-Marc Iran adaptation table in the library software.	96	53.9	71	39.9	11	6.2	-	-	-	-
4- In the library software, changing the structure of search and retrieval of resources based on new rules of RDA should be considered.	53	29.8	109	61.2	16	9	-	-	-	-

As the results of Table 7 show, about the first item, 92% of the respondents believe that it is necessary to use the help options in the appropriate number and for each field separately in the library software. Furthermore, 85% believe that it is possible to change the structure of library software according to the needs of each library. Moreover, 94% of the respondents have considered the possibility of using the RDA-Mark Iran adaptation table and the importance of creating it in library software. Regarding the fourth item, 91% believe that to implement RDA in library software, the restructuring of search and retrieval of resources should be done according to the new rules of RDA.

RQ 4: According to librarians, what are the most important major challenges in implementing RDA?

Table 8 shows the frequency distribution of the major challenges in implementing RDA in the libraries. As can be seen in the results of the table, from the point of view of 1.25% of the librarians of the three universities (Tehran, Tarbiat Modares, and Allameh Tabatabai), the problems in switching to the new library software are in the first place among the most important challenges. Further, "lack of information and sufficient knowledge to implement

RDA (24.5%)" and "problems in the internal communication of the library (22.7%)" are the next most important challenges, respectively.

Table 8

Frequency distribution of the answers to the items of the fourth question

Challenges	Frequency	Percent
Problems communicating with library users	30	5.6
Problem with internal library communication	121	22.7
Lack of sufficient information and knowledge to implement	131	24.5
Data compatibility	79	14.8
Problems switching to new library software	134	25.1
Lack of main trustee (to apply RDA rules)	39	7.3
Total	534	100

Discussion

The findings of the present study indicate that only 35% of academic librarians are fully familiar with the RDA standards, while 65% of them do not know these standards. Hence, it is necessary to train the academic catalogers and teach them new skills, which can be done by organizing workshops and seminars. Ultimately, it will increase librarians' ability to use RDA in the best way. Regarding the required corrections in bibliographic records, 94% of the respondents believed that first, it is necessary to correct the erroneous records (in terms of cataloging), 94% "Technical health of records (in terms of editing)," 88% "provided RDA-based core information to facilitate the cataloging process," 65% "Corrected inconsistent data in the records, " and 91% consider the importance of " The logical relationship between the records for designing data-relational structures and functional conceptual model " to apply the RDA standard. Thus, it is concluded that Catalogers must know RDA standards. To achieve this purpose, they need to understand the conceptual models of FRBR and FRAD, users' needs, and cataloging rules.

Also, the findings regarding the changes needed to implement the RDA standard in library software showed that 92% of respondents believe that it is essential to use "help options in the appropriate number and for each field" separately in the library software. Moreover, 85% believed that it should be possible to "change the structure of the software according to the needs of each library." 94% of them considered the "possibility of using the RDA-Mark Iran adaptation table" and creating it in library software" important, and 91% believed that to implement RDA in library software, "resource search and resource retrieval" should be based on new (RDA) rules. Therefore, database and library system administrators must first know the new RDA standards and then design a manual and a table showing the relationship of the Marc 21 to RDA to help the catalogers.

Comparing the current study's findings with those of previous papers shows that the results of this research were in line with those of other previous studies, such as Pazouki et al. (2013), Jahanshahi et al. (2013), and Caesar and Eichel (2009). Also, considering the findings of this research and other related papers, e.g., Fernandez & Cabonero (2020), Nwachi et al. (2021), Pazouki et al. (2013), Gadlorab (2010), and Sanchez (2010), it can be concluded that "Problems with switching to new library software" and "lack of sufficient knowledge and skills" are the most important challenges to implementing RDA rules among academic librarians.

Conclusion

RDA is one of the latest standards in the field of cataloging and the successor to Anglo-American cataloging rules (Second Edition). RDA has described a variety of digital and print sources and addressed many of the shortcomings of the Anglo-American. RDA is based on conceptual patterns and has adapted its terms and relationships from conceptual patterns. Due to the application of the conceptual, entity-relationship model of FRBR, this standard can be in the form of new semantic web standards, including the framework of RDF and its schema RDFs. As a result, terms and relationships can be put in the form of RDF, making it possible to describe and discover information sources more effectively in the web environment.

The RDA standard has replaced Anglo-American cataloging rules in libraries, especially academic libraries; of course, replacing and implementing it in bibliographic records and library software requires identifying existing problems from the librarians' and cataloguers' viewpoints and resolving them. In this regard, this study examined the challenges in this field from the perspective of academic librarians. In order of priority, Problems switching to new library software, Lack of sufficient information and knowledge to implement, Problems with internal library communication, Data compatibility, Lack of a main trustee (to apply RDA rules), and Problems communicating with library users were the challenges raised by the librarians.

In order to tackle the issues and challenges of implementing RDA discussed in this paper, the following recommendations can be regarded:

- 1- Organizing an RDA working group to increase the knowledge of catalogers and receive their feedback.
- 2- Creating a practical manual for implementing RDA and facilitating cataloguers' access to it.
- 3- Checking the validation of bibliographic records for possible errors.
- 4- Giving core information (based on RDA) in bibliographic records.
- 5- Holding webinars and virtual meetings about RDA with the presence of professors and expert cataloguers of universities and providing handbooks, educational manuals, audio and video training files to improve the professional knowledge of cataloging
- 6- Organizing meetings of consensus and exchange of views between library system developers (such as NOSA, Pars Azarakhsh, Kavosh library software, etc.) and librarians and cataloguers who are trained and professionals in RDA rules to make the necessary changes in the structure of library systems.

Endnote

1. Kaiser-Meyer-Olkin (KMO) Test for Sampling Adequacy

References

- Bagherifar, S. & Mousavi, A. (2017). A study of compatibility of RDA rules with Persian related works (Case study: Shahnameh). *Library and Information Science Research*, 7(1), 335-351. <https://doi.org/10.22067/riis.v7i1.47029> [in Persian]
- Banfi, E. & Gaudinat, A. (2019). Public libraries in Switzerland: RDA and the FRBRization watershed. *Library Management*, 40(1), 98-112. <https://doi.org/10.1108/LM-08-2017-0074>

- Caesar, I. & Eichel, D. (2009). Challenges for the Implementation of Resource Description and Access (RDA) Case Study Germany. In *17th annual BOBCATSSS symposium (Bobcatsss 2009), Porto (Portugal)*. Retrieved from <http://eprints.rclis.org/12927/1/95.pdf>
- Chapman, A. (2006). RDA: A new international standard. *ARIADNE. Web Magazine for Information Professionals*, 49. Retrieved from <https://www.ariadne.ac.uk/issue/49/chapman/>
- Danesh, F., Afshar, M. & Nouri, R. (2006). RDA: A new standard for describing and accessing digital resources. In *Conference of the Library and Information Societies* (pp. 519-534).
- El-Sherbini, M. (2018). RDA implementation and the emergence of BIBFRAME. *JLIS, Italian journal of Library Science, Archival Science and Information Science*, 9(1), 66-82. <https://doi.org/10.4403/jlis.it-12443>
- Fernandez, A. & Cabonero, A. (2020). Transcribing knowledge and skills of academic librarians in using resource description and access standards. *Library Philosophy and Practice (e-journal)*. 3989. Retrieved from <https://digitalcommons.unl.edu/libphilprac/3989>
- Hariri, N., Bakhtiari, E., Babolhavaeji, F. & Taher, M. (2013). Investigating the possibility of implementing the conceptual model of functional requirements of bibliographic records (AFR) in Iranian library software. *Library and Information Science*, 16(3), 31-57. Retrieved from https://lis.aqr-libjournal.ir/article_42909_1fabfeb134e2371f00d323a6ff9b86a0.pdf?lang=en [in Persian]
- Jahanshahi, M., Rezaei Sharifabadi, S. & Karbala, M. (2013). A study on the applicability of the resource description and access (RDA) in the Library, Museum, and Document Center of Iran Parliament. *Ganjine-ye Asnad*, 23(2), 82-98. Retrieved from https://ganjineh.nlai.ir/article_1153_79d8a56a9b878870608f43593fbd9aed.pdf?lang=en [in Persian]
- Khasseh, A. (2010). Farewell to the Anglo-American Cataloging Rules: RDA is a tool for cataloging digital resources. *Book Quarterly*, 20(3), 321-336. [in Persian]
- Kiorgaard, D. (2009). Resource Description and Access. *National Library of Australia*. Retrieved from <https://www.rdatoolkit.org/archivedsite/docs/dk20090122.pdf>
- Miksa, S. D. (2009). Resource description and access (RDA) and new research for potentials. *Bulletin of the American Society for Information Science and Technology*, 35(5), 47-51. <https://doi.org/10.1002/bult.2009.1720350511>
- Moradi, K. (2010). *Examining the descriptive elements used in the bibliographic records of Iran's digital libraries and providing a suggested model for applying these rules*. Master's Thesis in Library and Information, Payam Noor University, Tehran. [in Persian]
- Moradi, K. & Haji Zain Al-Abedini, M. (2011). Changing cataloging rules: The Description and Access to Resources (RDA) standard replaces the Anglo-American cataloging rules. *Journal of Library and Information Science*, 14(1), 269-296. [in Persian]
- Morris, S. R. & Wiggins, B. (2016). Implementing RDA at the Library of Congress. *JLIS It*, 7 (2), 199- 228. <http://dx.doi.org/10.4403/jlis.it-11824>

- Mozafari, A., Haji Zina Al-Abedini, M. & Pazouki, F. (2017). in RDA of Consonance Records Bibliographic Serials Catalogues. *Journal of Information Processing and Management*, 32(3), 897-925. Retrieved from https://jipm.irandoc.ac.ir/article_699414_eefbf49c0f67e30a2916d24186ed0460.pdf [in Persian]
- Nwachi, Ch., Ihekwaaba, E. & Nwafor, C. (2021). Implementation of RDA in cataloguing and classification in 21st century: Issues challenges and prospects. *Library Philosophy and Practice (e-journal)*. 5245. (e-journal). 5245. <https://digitalcommons.unl.edu/libphilprac/5245>
- Pazouki, F. (2013). *Feasibility study of using RDA in the library and center of national documents of the Islamic Republic of Iran*. Doctoral Dissertation, Payame Noor University, Tehran. [in Persian]
- Pazouki, F., Haji Zina Al-Abedini, M. & Arastoopoor, Sh. (2013). Analysis of the status of Persian bibliographic records in the National Bibliography of Iran in order to examine the application of the rules of description and access to the source (RDA). *Library and Information Sciences*, 16(1), 89-121. [in Persian]
- Rakhshani, M., Nokarizi, M. & Haji Zain Al-Abedini, M. (2014). An online description of a flour compared to Anglo-American cataloging rules. *Quarterly Journal of National Library and Information Organization Studies*, 4(4), 82-99. [in Persian]
- Sanchez, E. R. (2010). RDA, AACR2, and you: What catalogers are thinking. In Sanchez, E. (Ed.) *Conversations with Catalogers in the 21st Century*, Chapter 3, pp. 20-70. Retrieved from <https://digital.library.txst.edu/server/api/core/bitstreams/4fab253a-683b-4353-8a49-a129a64cdba7/content>
- Shahmirzadi, T., Haji Zina Al-Abedini, M. & Pazouki, F. (2019). Implementation of Resource Description and Access (RDA) in Agricultural Research, Education and Extension Organization: Preparation requirements bibliographic records. *Knowledge and Information Management*, 5(3), 57-70. <http://dx.doi.org/10.30473/mrs.2019.47126.1392> [in Persian]
- Taheri, M. (2009). Design a standard digital library. Paper presented at *the First Specialized Conference on Digital Libraries*, Tehran, Iran. [in Persian]
- Welsh, A. & Batley, S. (2012). *Practical cataloguing: AACR, RDA and Marc 21*. London: Facet publishing.