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Abstract

Purpose – The purpose of this paper is to validate the usefulness of resource description and access (RDA) from user perspectives by implementing an RDA-based bibliographic retrieval system, and comparing it against two retrieval systems.

Design/methodology/approach – Surveys and interviews were conducted to gather responses from 20 subjects who used the systems. Usability was measured according to the following metrics: search usefulness from search process and results; search efficiency, measured in time and the number of steps involved; general satisfaction for search results and process, and for information need; satisfaction for search functionalities, with five sub-measures (usability of functions of search tool, appropriateness of search results, usability of additional information, usability of associative relations, and appropriateness of search categories); and system convenience in terms of understandability and ease.

Findings – The survey results indicate that all but the satisfaction for appropriateness of search categories showed significant differences between the systems. The interviews show that the RDA system received from the subjects a more positive evaluation compared to the counterpart systems, in search usefulness, search efficiency, general search satisfaction, satisfaction for search functionalities.

Practical implications – Though a few organizations such as the Library of Congress in the USA have implemented RDA, no such endeavors have been undertaken in the context of Korean bibliography, and especially for the systematic validation of usability of such a system from user perspectives.

Originality/value – This is the first published study that validates the usefulness perceived by users of RDA in the context of Korean bibliography.

Keywords Bibliography environment in Korea, RDA-based retrieval system, Resource description and access, User evaluation for bibliography system

Paper type Research paper

Introduction

With the development of online media, new forms of information resources have rapidly increased and search functions diversified. Accordingly, user expectations about information search results are rising and information needs have varied. Specifically, when resources are published in various languages and formats and exist in distributed environments, it is insufficient to satisfy users' need that demands a highly aggregated point of access to bibliographic information, and therefore we must provide more facilitated ways for aggregated information recovery by explicitly specifying relations, which exist but may have required more time to find, between distributed resources, extending the purview of resource description.

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The current bibliographic system is based on Anglo-American Cataloguing Rules 2 (AACR2) and/or Machine Readable Cataloguing (MARC) data formats, which face problems in describing relations in diverse and new resources, and are not adequate to satisfy multifaceted information needs of users (Lee and Kim, 2012). When a resource is described in a flat linear format as in MARC with possibly some simple links, resources relevant to it are not readily searchable.

In order to overcome the problem, resource description and access (RDA) was conceived and developed as a new description standard for old and new emerging resources. RDA is based on the Functional Requirement of Bibliographic Records (FRBR) and Functional Requirement for Authority Data (FRAD) concept models, purported to be able to more aptly manage online resources. While inheriting the goal and value of AACR2, which is to provide rules for description of, and the provision of access points for, all library materials (www.aacr2.org/about.html), RDA facilitates easy use, which for example is manifest in the restricted use of highly technical terms pertaining to bibliography while supporting existing standards such as MARC and Dublin Core to ensure interoperability (Kim *et al.*, 2013).

In 2008, the core of RDA was published as an offline booklet, and since 2010 an RDA toolkit has become available, spurring RDA implementation tests in National Library of Medicine (NLM) that led to revisions on certain elements (Boehr *et al.*, 2012). Currently, national libraries, such as the US Library of Congress and the National Library of Australia, have adopted RDA, which subsequently entailed required modifications in catalogue systems and policies, and new training services (Lee, 2011; Park, 2010).

In Korea, studies abound in analyzing RDA itself, cross-examining RDA and Korean Cataloging Rules (KCR), and identifying necessary future modifications in KCR in case RDA comes in full force (Park, 2009; Cho, 2009; Lee, 2010). There have been, however, little work in studying the usefulness of RDA in the light of user perspectives, a task significant when RDA is gaining momentum among national libraries as a future de facto description standard. Thus, this study aims to apply RDA to Korean bibliographical records to increase record connectivity, for the purpose of analyzing its usability perceived by users. A pilot system was built that houses various RDA-conformant Korean bibliographic records. The system was then compared against two existing non-RDA systems, in order to validate the usefulness of the RDA-based system in terms of various usability measures such as search efficiency and satisfaction for search functionalities.

RDA

RDA is a multilingual resource description and access standard that aims to enhance the range of cataloging to not only resources that traditional library environments offer by means of AACR2, but also those that new web-based environments produce. Previously, description was targeted toward physical entities, but RDA transcends it by including in its fold virtually any resources.

RDA is based on the FRBR and FRAD models. As such, RDA describes a resource by using the properties and relations of FRBR entities – work, expression, manifestation, and item; and it uses the properties and relationships of person, family, corporate body, and place entities in FRAD, to describe related resources to a resource (Kim *et al.*, 2013; IFLA Study Group on the FRBR, 1998; IFLA Study Group on the FRNAR, 2009).

Prior to RDA, resource description was distinct from means for resource search or subject headings, but RDA does not make this distinction. Instead of separate rules for resource identification (description) and search (subject headings), users can search,

identify, select, and acquire resources from described properties of manifestation entities and items. In other words, the way that resources are described in RDA takes into consideration the way users search, identify, select, and acquire resources of interest to them (Lee and Kim, 2012).

Consequently, RDA first contains an increased number of identification elements. For example, carrier type description was a single entry as manifestation, which now has been expanded in RDA as nearly 20 independent elements, enabling more focussed and refined identification. Also, more elements for identifying authority data are defined in RDA. Second, RDA uses, as its basis for bibliographical relations, those put forth by Tillett (1991, 2001) for description of related resources, in order to enhance its descriptive power for bibliographical relations, previously not supported (Tillett, 1991, 2011; Carlyle and Fusco, 2002). For example, in addition to the equivalent relation, entity relation, and sequential relation afforded by MARC, RDA adds primary relation, derivative relation, and descriptive relation, and subdivides class relation into such distinctions as part-whole relation and accompanying relation. Third, RDA supports metadata interoperability by providing RDA mapping to ISBD, MARC21, and Dublin Core (Park, 2010; Lee, 2011). Fourth, for facilitated metadata entry, each identification element is provided as a list of items.

RDA has approximately 120 relationships to be used among resources and persons, families, and corporate bodies, and about 340 relationships between work, expression, manifestation, and item.

In summary, RDA describes resources by using FRBR entities (work, expression, manifestation, and item) combined with FRAD entities (person, family, corporate body), to strengthen aggregation of data and promote ease of use by users.

Methods

Usability

Of various quality factors such as correctness, reliability, efficiency, and maintainability, usability is an important quality factor for interactive systems, and defined as all assessable characteristics of user interface (Nielsen, 1993; Doborah, 1999). The questionnaires used in this study employed search efficiency and satisfaction, both defined in the ISO standard(s) and Nielsen, and the search efficiency metric is further divided into search effectiveness and efficiency. Three satisfaction measures were used: general satisfaction for search results and process, satisfaction for search functionalities, and system convenience.

Usability metrics

The metrics (Table I) are developed and restructured in reference to the metrics found in Oh and Park (2005), Jeng (2005), Gu and Lee (2009).

Test subjects

In order to fine-tune our experiment, we performed a pre-test to proactively identify and solve potential problems that may arise during a real test. Two subjects enrolled in a Master's program in History undertook the pre-test. The pre-test helped us locate problems and solutions, which aided us in finalizing our system modeling and questionnaires. Afterwards, the real test was conducted on 20 subjects, all with a Master's degree in History. Subjects performed in a controlled environment assigned search tasks, which with their consent were all recorded.

Factors	Subordinate factors	Number of questions	Method
Search usefulness	Search results	1	Survey/interview
	Search process	1	
Search efficiency	Search time	8	Experiment observation
	Number of steps		
General search satisfaction	Search results	1	Survey/interview
	Search process	1	
	Information needs	1	
Satisfaction for search functionalities	Usefulness of functions of search tool	1	
	Appropriateness of search results	1	
	Usefulness of additional information	1	
	Usefulness of associative relations	1	
	Appropriateness of search categories	1	
System convenience	Understandability	3	
	Ease	2	

Table I.
Usability metrics

After the test was done, they were asked to answer in our questionnaire questions about search usefulness, general satisfaction, satisfaction for search functionalities, and other, as well as write comments if any. In order to deepen our understanding of our subjects' answers, we selected four subjects (1, 6, 11, 16) and interviewed them with the questions in the questionnaires.

Study hypotheses

The conceptual hypotheses of the study are as follows:

(1) There will be no difference between the RDA-based bibliography system and the counterpart systems in search usefulness felt by the user.

(2) There will be no difference between the RDA-based bibliography system and the counterpart systems in search efficiency.

(3) There will be no difference between the RDA-based bibliography system and the counterpart systems in general satisfaction for search results and process.

(4) There will be no difference between the RDA-based bibliography system and the counterpart systems in satisfaction for search functionalities.

(5) There will be no difference between the RDA-based bibliography system and the counterpart systems in system convenience.

More details on the hypotheses are found in Appendix 1.

Search queries

Search queries based on the work by Oh and Park (2005), are divided into simple, advanced, and subject queries. Each query consists of two to four sub-queries, as shown in Table II.

Query type	Task
Simple	Find the published date of the first edition of the novel '사도세자의 고백' (*Confessions of Sado, Crown Prince*)
	Find the number of revisions of the novel '칼의 노래' (Song of the Sword)
	Find links that stream '세종대왕' (King Sejong)
	Find the main poster of the film '성웅 이순신' (The Great Hero, Sun-shin Yi)
Advanced	Find the novel based on which the drama '불멸의 이순신' (The Immortal Sun-shin Yi) was made
	Find dramas which are based on the novel '불멸' (Immortal)
	Find the novel based on which drama '영원한 제국' (Eternal Empire) was made
	Find the sequel title of KBS history documentary '조선왕조 500 년–뿌리깊은 나무' (500 years of Chosun Dynasty – Trees with deep roots)
	Find the TV series that aired before history documentary '임진왜란–홍의장군 (Imjin War – Red-armored General)
	Find works of the author of the novel '한권으로 보는 대왕세종' (King Sejong in one book)
	Find titles of other history dramas from the network that aired '뿌리깊은 나무' (Trees with deep roots)
	Find English versions of '난중일기' (*Chronicles of War*)
Subject query	Free subject search for keywords '정조' (King Jeongjo), '이순신' (Sun-shin Yi), and '세종대왕' (King Sejong)

Table II.
Search queries

Sample data collection

The database of the pilot system is comprised of contents related to historically notable personages who lived during the Chosun Dynasty. In order to procure balanced numbers of resources for the database, our collected books are limited to those published after 1991, and all non-book materials are related to "King Sejong," "King Jungjo," and/or "Sun-shin Yi." The final collection of resources is made, in accordance to RDA, to be conformant to FRBR for bibliography data, and to FRAD for authority data.

Table III shows the quantity collected for each resource category.

Results

Pilot system database design

Database entities were selected and defined. Microsoft Visio was used for data modeling, and the final database ERD is shown at Figure 1.

	Category		Data quantity	
FRBR (Bibliography data)	Works	세종 (King Sejong)	494	1,072
		정조 (King Jungjo)	303	
		이순신 (Sun-shin Yi)	275	
	Expressions	세종 (King Sejong)		1,351
		정조 (King Jungjo)		
		이순신 (Sun-shin Yi)		
	Manifestations	세종 (King Sejong)		1,880
		정조 (King Jungjo)		
		이순신 (Sun-shin Yi)		
FRAD (authority data)	Person		706	1,074
	Corporate body		364	

Table III.
Sample data for the pilot system

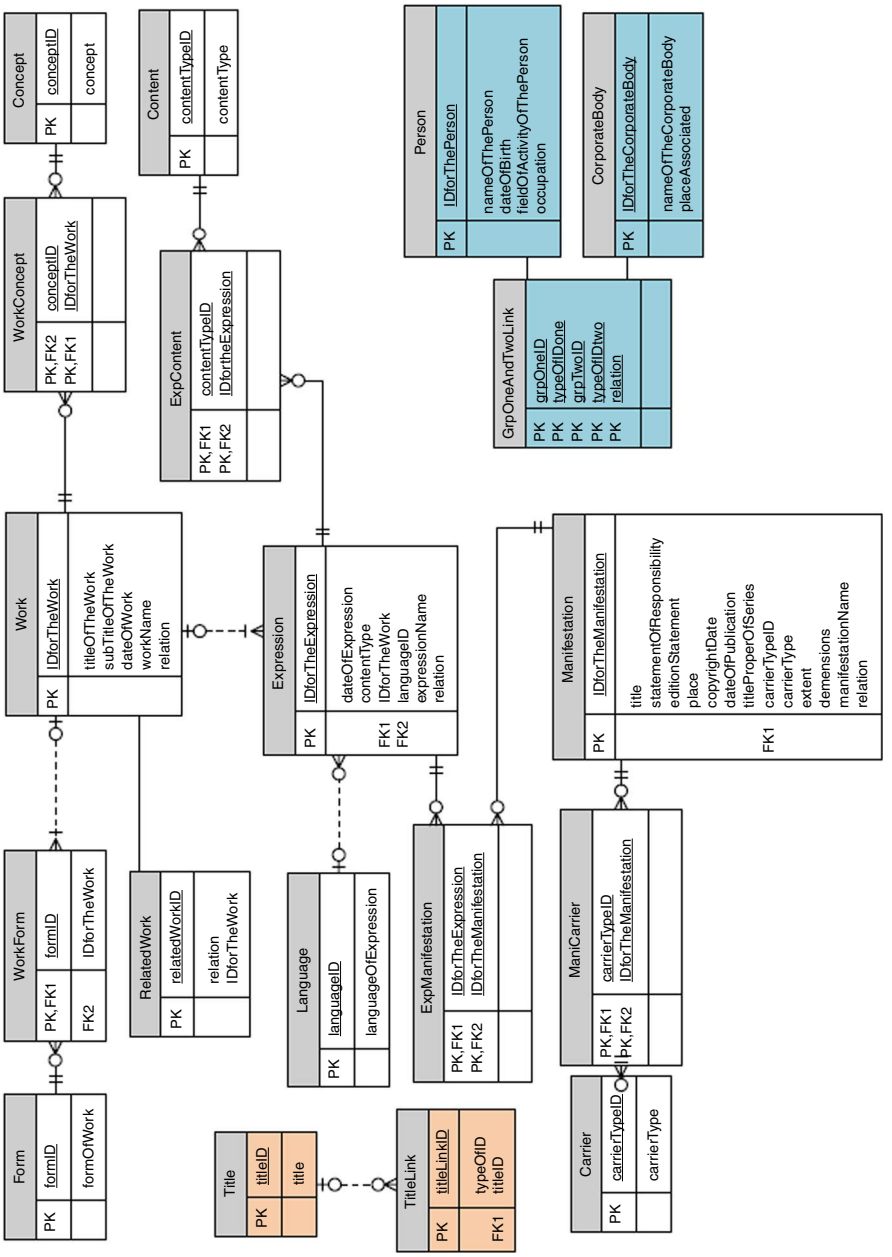

Figure 1.
Database ERD for pilot system

Entity properties were defined by referencing RDA standard documents and the RDA Toolkit, and the properties use RDA label names whenever possible. A label name contains no space and uses Camel Case (ex: contentType). The FRBR Group 1 Item entity refers to location, hence, excluded from the study. Only those RDA elements relevant to the study are used. Here we use the novel "*Song of the Sword*" as an example to describe the entities in the database: The identifier, IDforTheWork, is assigned a value automatically by the system. Values for mandatory elements are entered: titleOfTheWork ("*Song of the Sword*"), DateOfWork ("2001"), WorkName (signifying a creator, "Hoon Kim"), relation in the Work table between title and creator. There exists a 1:N relation between work and expression. If language or content type changes, a different expression is entered even when the work remains the same. An expression can hold more than one manifestation based on carrier type. IDs for expression and manifestation are automatically assigned, and both hold IDforTheWork. A bridge entity is created when two entities, such as work and concept, or expression and content, hold an M:N relation. Title, person, and CorporateBody are separate entities in order to facilitate search. More details on the database can be found in Appendix 2.

Pilot system web interface

A SQL server was used to house the sample records, and a web interface was implemented using .NET for easy searching and browsing. Figure 2 shows the entry screen of the pilot system.

The pilot system provides a quick search menu similar to those of counterpart systems, and search can be carried out based on all resources, title, author, or subject. Search results (Figure 3) are organized around work, and related work, expression, manifestation are displayed as lists. Also, users can find detailed information on resource relations, persons, and corporate bodies.

Counterpart systems

Two counterpart systems were used: the National Library's web-based retrieval system called "Dibrary," and the Korean Film Archive' web service called "KMdB."

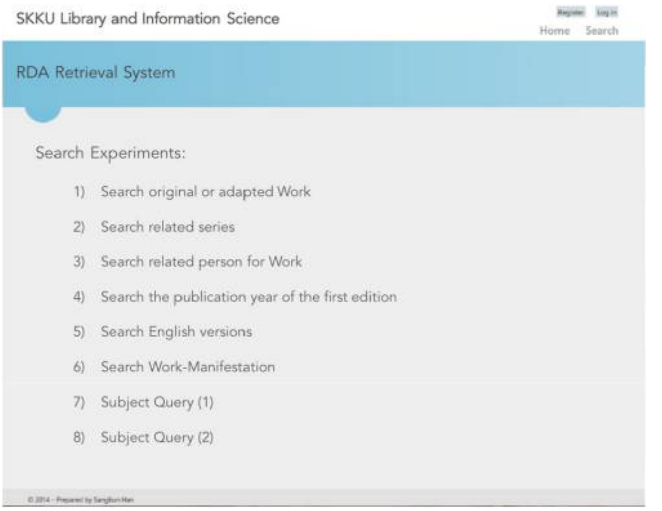

Figure 2.
Entry screen of the pilot system

Figure 3.
Search results: by work, expression and manifestation

Bibliographical resources on books, e-books, visual-audio materials are accessed from Dibrary, and those on films from the KMdB. Search constraints were put in place in the counterpart systems due to the discrepancy in the amounts of resources available from them in comparison to that of the pilot system, which would affect, for instance, search time and search steps. Our test subjects were duly notified and explained of the search environments in the counterpart and pilot systems.

Evaluation

Survey analysis

User survey data gathered after user evaluation were collected and analyzed with Statistical Analysis System (SAS). Since the data are not normally distributed with p-value of 0.05, a Wilcoxon signed-rank test was employed to test our hypotheses. More details on the survey used in the study are found in Appendix 1.

Our tests show that five measures (search usefulness, search efficiency, general satisfaction, satisfaction for search functionalities, and system convenience) all showed significant differences between the pilot and counterpart systems, with p-value of 0.05, except for one measure (appropriateness of search categories). For detailed analysis results, please refer Table IV.

Hypothesis verification results

See Table IV.

Interview analysis

The interview data were analyzed by using Miles and Huberman (1994) material analysis procedures (Cho *et al.*, 2011; Creswell, 2007). The analyses were conducted for each system in terms of search usefulness, general satisfaction, satisfaction for search functionalities, system convenience. The interview questions were designed to further delve into the reasons for survey answers by the randomly selected interviewees. It should be noted that the interviewer did not have access to specific survey answers by the interviewees. The following is a summary explanation of the interview results: in search usefulness, the interviewees contributed "successful retrieval of information" to the pilot system, and "time and steps" and "lack of certainty for results" to the counterparts; in general search satisfaction, " satisfactory search results" and "retrieval of accurate information" to the pilot, and "unfulfilled information needs" to the counterparts; in satisfaction for search functionalities, "usefulness of related resources" to the pilot, and "checkboxes for constraining search options" to the counterparts; in system convenience, "necessity for available search options" and "more user-friendly terms" to the pilot, and "familiarity" and "no existing alternatives" to the counterparts.

Some interviewees responded for search usefulness by saying, "It was hard for me to make a reasonable judgment as to whether the results from the counterpart systems are the ones I was looking for, and this might be the reason why I took a longer time," or "I was pretty sure that my search was successful by looking at the results from the pilot system."

As for general search satisfaction, overall responses were positive for the pilot system as narrated by an interviewee, "It seems like the pilot system showed me right information"; however, it was mostly in the negative for the counterparts as an interviewee said, "The results on the screen were not what I hoped to get. If they were

Category		Sample	Mean	STD	Min.	Max.	Sign Rank	Significance (p)	Verification
H1.1	CS	20	2.55	0.6863	2	4	68	< 0.0001*	Rejected
	PS	20	3.75	0.7164	3	5			
H1.2	CS	20	2.7	0.8645	1	4	68	< 0.0001*	Rejected
	PS	20	4	0.4588	3	5			
H2.1	CS	160	91.0358	72.4243	4.01	300	−2,220	< 0.0001*	Rejected
	PS	160	68.6503	66.9031	9.21	300			
H2.2	CS	160	5.1063	3.7828	1	20	−2,069	< 0.0001*	Rejected
	PS	160	3.6250	3.7412	1	20			
H3.1	CS	20	2.45	0.9445	1	4	59	0.0011*	Rejected
	PS	20	3.45	0.6863	2	4			
H3.2	CS	20	2.25	0.9105	1	4	86	< 0.0001*	Rejected
	PS	20	3.65	0.7452	2	5			
H3.3	CS	20	2.45	0.5104	2	3	71.5	0.0002*	Rejected
	PS	20	3.75	0.8507	2	5			
H4.1	CS	20	2.2	1.1965	1	4	13.5	0.4097*	Fail to reject
	PS	20	4	0.8584	2	5			
H4.2	CS	20	2.85	1.04	1	4	85.5	< 0.0001*	Rejected
	PS	20	3.8	0.8335	2	5			
H4.3	CS	20	2.3	1.0311	1	4	64	0.0002*	Rejected
	PS	20	3.75	0.7164	2	5			
H4.4	CS	20	2.4	0.7539	1	4	76.5	< 0.0001*	Rejected
	PS	20	4.1	0.7182	2	5			
H4.5	CS	20	2.6	0.7539	2	4	95	< 0.0001*	Rejected
	PS	20	3.75	0.5501	3	5			
H5.1	CS	60	2.7667	0.9806	1	5	324	< 0.0001*	Rejected
	PS	60	3.4833	0.8732	2	5			
H5.2	CS	40	2.725	0.8469	1	4	268.5	< 0.0001*	Rejected
	PS	40	3.825	0.5495	2	5			

Notes: H, Hypothesis; CS, counterpart system; PS, pilot system. *$p < 0.05$

Table IV.
The results of hypotheses testing

the right results, well, I have nothing to say, but I did not have feelings that what I wanted was delivered by the counterpart systems."

As for satisfaction for search functionalities, one interviewee expressed the satisfaction of the pilot system by saying "I liked the function that shows related resources in the pilot system. In the counterpart systems, I could check the related resources only when the note/description field showed resource relatedness, which was a bit cumbersome."

For system convenience, one interviewee said, "I felt at ease with the counterpart systems since I have been using them. The pilot system was fine, but it would be much better if the system offered more search options."

In a nutshell, the pilot system received positive responses in all measures from the interviewees, except in system convenience, which is self-evident since the counterparts offer familiar, comfortable organization of resources to the users, whereas the pilot presents a new, unfamiliar organization. Further details on interview analysis are found in Table V.

Interview analysis results

See Table V.

		1st option		2nd option	
Categories	Partition	Factors	Frequency	Factors	Frequency
Search usefulness	CS	Time and steps	3	Further search required	2
		Lack of certainty for results	3		
	PS	Successful retrieval of information	4	Simple results seen	2
				Simple clicking	2
General search satisfaction	CS	Unfulfilled information needs	3	Neutral	1
				Slightly satisfied	1
				Comparable to portal sites	1
				Needs material type function	1
				Needs author search function	1
				Useless information	1
	PS	Satisfactory search results	2	Difficulty in keyword combining	1
				Shows limited information	1
		Retrieval of accurate information	2	General ease	1
				Allowed small discomfort in process	1
				Uncomplicated	1
Satisfaction for search functionalities	CS	Checkboxes for constraining search options	3	Limitations of period function	2
				No related information	2
	PS	Usefulness of related resources	4	Needs filtering function	2
				Limitation of right truncation function	2
				Link function useful	2
				Resource type function useful	2
				Relationship information useful	2
System convenience	CS	Familiarity	2	Uncertainty of results after first search	1
		No existing alternatives	2	Inconvenient repeated search	1
				Difficult if keywords unknown	1
				Needs search function for advanced users	1
				Complicated search process	1
				Indistinguishable material	1
	PS	Necessity for available search options	3	Restricted functions	2
			3	Term distinction uncertain	2
		More user-friendly terms		RDA possibility	2

Table V.
The results of interview analysis

Note: CS, Counterpart system; PS, pilot system

Conclusions

This study presents an RDA-based bibliographical system, and validates the usability of RDA from user perspectives over against two traditional bibliographical retrieval systems in terms of five usability metrics (search usefulness, search efficiency, general search satisfaction, satisfaction for search functionalities, and system convenience). And it is the first systematic attempt to apply RDA to Korean bibliographies to investigate how end users would perceive its usefulness.

Survey data reveal that except for one metric (appropriateness of search categories), all other metrics show significantly positive user responses for the pilot system. In general, the interview results resonate with the survey results, save that the interviewees felt more inclined toward the counterparts in system convenience due to their familiarity with them. Our evaluation results are reinforced in that the subjects are not specialists in bibliography, thus precluding potential user preconceptions on RDA.

The study uses a limited number of resource types such as print books, e-books, and films – not exhaustive of all the resource types afforded by RDA. A bigger picture of how users would perceive the usefulness of RDA has yet to be investigated with more coverage of resource types made available by RDA.

There are several venues for future research as regards RDA in relation to the current study. How does Korean experience of RDA compare to other international examples? What user search interfaces would be optimal for RDA? These questions will continue to form the basis of our inquiry in the future.

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Appendix 1. Operational hypothesis

1. There will be no difference between the pilot system and the counterpart systems in search usefulness felt by the subjects.
   - 1.1 There will be no difference between the pilot system and the counterpart systems in search usefulness of search results felt by the subjects.
   - 1.2 There will be no difference between the pilot system and the counterpart systems in search usefulness of search process felt by the subjects.
2. There will be no difference between the pilot system and the counterpart systems in search efficiency.
   - 2.1 There will be no difference between the pilot system and the counterpart systems in search time.
   - 2.2 There will be no difference between the pilot system and the counterpart system in number of search steps.
3. There will be no difference between the pilot system and the counterpart systems in general satisfaction felt by the subjects.
   - 3.1 There will be no difference between the pilot system and the counterpart system in satisfaction of search results felt by the subjects.

3.2 There will be no difference between the pilot system and the counterpart system in satisfaction of search process felt by the subjects.

3.3 There will be no difference between the pilot system and the counterpart system in satisfaction of information needs felt by the subjects.

4. There will be no difference between the pilot system and the counterpart systems in satisfaction for search functionalities felt by the subjects.

4.1 There will be no difference between the pilot system and counterpart system in usefulness of functions of search tool felt by the subjects.

4.2 There will be no difference between the pilot system and counterpart system in appropriateness of search results felt by the subjects.

4.3 There will be no difference between the pilot system and counterpart system in usefulness of additional information felt by the subjects.

4.4 There will be no difference between the pilot system and counterpart system in usefulness of associative relations felt by the subjects.

4.5 There will be no difference between the pilot system and counterpart system in appropriateness of search categories felt by the subjects.

5. There will be no difference between the pilot system and the counterpart systems in system convenience felt by the subjects.

5.1 There will be no difference between the pilot system and the counterpart systems in understandability felt by the subjects.

5.2 There will be no difference between the pilot system and the counterpart systems in ease felt by the subjects.

Appendix 2

No	Table name	Factor	Definition	Required
1	Work	IDforTheWork	ID of work	○
		titleOfTheWork	Title of work	○
		subTitleOfTheWork	Subtitle of work	
		dateOfWork	Date of work	○
		WorkName	Individual/group associated with work	○
		Relation	Relationship between work and individual/group	○
2	Expression	IDforTheExpression	ID of expression	○
		dateOfExpression	Date of expression	○
		contentType	Content type of expression	○
		IDforTheWork	ID of work	○
		languageID	Language of expression	○
		ExpressionName	Individual/group associated with expression	
		Relation	Relationship between expression and individual/group	
3	Manifestation	IDforTheManifestation	ID of manifestation	○
		title	Title of manifestation	○
		statementOfResponsibility	Statement of responsibility	○
		designationOfEdition	Designation of edition	
		place	Place	
		copyrightDate	Copyright date	
		dateOfPublication	Publication date	
		titleProperOfSeries	Proper title of series	
		carrierTypeID	ID of carrier type	○
		carrierType	Carrier type	○
		extent	Extent	
		dimensions	Dimensions	
		manifestationName	Individual/group associated with manifestation	
		relation	Relationship between manifestation and individual/group	
4	Form	formID	ID of genre and form of work	○
		formOfWork	Type of genre and form of work	○
5	Concept	conceptID	ID of concept terms	○
		concept	Concept terms	○
6	Content	contentID	ID of expression content	○
		contentType	Content type	○
7	Language	languageID	ID of expression language	○
		language	Language	○
8	Person	IDforThePerson	ID of individual	○
		nameOfThePerson	Name of individual	○
		dateOfBirth	Date of birth	
		fieldOfActivityOfThePerson	Field of Activity	
		occupation	Occupation	

Table AI.
DB table of pilot system

(*continued*)

No	Table name	Factor	Definition	Required
9	CorporateBody	IDforTheCorporateBody	ID of corporate body	○
		nameOfTheCorporateBody	Name of corporate body	○
		place	Place of corporate body	
10	Carrier	carrierTypeID	ID of carrier type	○
		carrierType	Carrier type	○
11	RelatedWork	relatedWorkID	ID of related work	○
		IDforTheWork	ID of work	○
		relation	Relationship of work with related work	○
12	Title	titleID	ID of title	○
		title	Title	○
13	TitleLink	titleLinkID	ID of title link	○
		typeOfID	Type of title (among work, expression, manifestation)	○
		titleID	ID of title	○
14	WorkForm	formID	ID of genre and form of work	○
		IDforTheWork	ID of work	○
15	WorkConcept	conceptID	ID of concept	○
		IDforTheWork	ID of work	○
16	ExpContent	contentID	ID of expression content type	○
		IDforTheExpression	ID of expression	○
17	ExpManifestation	IDforTheManifestation	ID of manifestation	○
		IDforTheExpression	ID of expression	○
18	ManiCarrier	carrierTypeID	ID of carrier type	○
		IDforTheManifestation	ID of manifestation	○
19	GrpOneAndTwoLink	grpOneID	ID of group 1	○
		typeOfIDone	Type of group 1	○
		grpTwoID	ID of group 2	○
		typeOfIDtwo	Type of group 2	○
		relation	Relationship between group 1 and group 2	○

Table AI.

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