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Journey of Catalogue from Panizzi's Principles to Resource Description and Access

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ABSTRACT

This paper discusses that cataloguing continues to be basic tool of knowledge organisation which has taken over even the function of classification bringing together similar ideas accessible on multiple points. It traces the history of cataloguing and individual contributions made by Panizzi, Lubetzky, Cutter, and Ranganathan who laid the foundation for modern cataloguing. It discusses the background of Resource Description and Access (RDA) code as development over AACR-2. The conceptual model of Functional Requirements for Bibliographic Records (FRBR) along with its new terminology and basic principle of entity-relationship have been explained. While discussing new features of RDA, it has also been compared with AACR-2 to show the main difference between the two. It concludes that RDA is a descriptive catalogue code with metadata structure with added scope and advantages over AACR-2R but with mixed professional reaction on its adoption.

Keywords: Resource description and access, functional requirements for bibliographic records, FRBR, Ranganathan, Panizzi, Charles Ammi Cutter, Lubetzky, cataloguing, knowledge organisation, entity-relationship, AACR, catalogue codes, classified catalogue code

1. INTRODUCTION

Knowledge organisation is the core of librarianship and many of the professional activities revolve around it. It is one of the major professional challenges to organise the resources effectively to provide easy and timely access on multiple access points irrespective of their location and ownership using appropriate technology and methods. Library has no excuse to show its inability to provide information available under the pretext that source of information is not in its holding. The knowledge organisation is becoming more and more complex due to rapid growth of resources coming in varied formats. The advent of Internet and its technology has direct implication on knowledge organisation. Till 1980's libraries were limited to organise their respective collections. But the scope now is much wider when libraries are expected to provide access to all resources available globally which was out of imagination before the advent of computer age.

User behaviour in the present new environment of present digital age is ever changing where they expect every information easily available on easiest platform like web. Convenience in use of resources is a dominant factor with least reliance on authority and standard of information. Today's users are highly impatient, expecting all information on their desktop, preferably on mobile phones and iPods. Therefore, organisation, repackaging and integrating of web and other traditional resources together is becoming increasingly important. In such circumstances, organisation of all existing knowledge resources irrespective of their location, availability and forms fall under the mandate of today's librarianship. This complex situation has been described by Elaine Svenonius[1] as:

"The essential and defining objective of a system for organising information, then, is to bring essentially like information together and to differentiate what is not exactly alike. Designing a system to achieve this purpose is subject to various constrain: It should be economical, it should maintain continuity with the past (given the existence of more than 40 million documents already organised), and it should take full advantage of current technologies".

Cataloguing and classification have been basic tools for arrangement and retrieval of knowledge and information which deal with analysis of information

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resources into classification numbers/codes/tags and other methods of contents analysis. There has been thinking that role of classification and catalogue may not continue to be as important as used to be in the past. But till shelf arrangement continues, the role of classification cannot be undermined. Even its role in organisation of web resources is being realised and applied. Arranging resources under categories, groups, and communities which is being done by many search engines and directories is also a form of classification which provides systematic and integrated approach to resources. Therefore, role of classification in systematic and relational arrangement cannot be undermined. Classification and cataloguing which is also called twin process would continue to be basic and essential tools of resource management and discovery for all times to come. Newly emerging subjects have implication on classification schedules to accommodate them at their right place and sequence according to their degree of relationship among them. As such, new editions of classification schemes are being brought out regularly to accommodate newly emerged subjects and their subdivisions. In comparison between the classification and the cataloguing, cataloguing has undergone many changes in the recent past and its rules continue to evolve which are being incorporated in the revised cataloguing rules. In the present age of information and information explosion, there is no dearth of generation and availability of new knowledge and information. But searching and retrieval of information is becoming more complex and efforts are on to make searching comprehensive as well as precise and pinpointed. Today's users expect that they should not get only documents on their interest area but also be exposed to all other related resources, which may interest them more than their primary search. Therefore, diverse resources from different locations need to be integrated to provide services from a single window.

2. HISTORICAL BACKGROUND

Historically, systematic cataloguing started only with 91 rules written by Panizzi, followed by Charles Ammi Cutter which also went under various revision in 1889, 1891, and 1904. Panizzi's 'Rules for the Compilation of the Catalogue' published in 1941 by British Museum laid the foundation for future codes which covered rules for author and title entries, anonymous works, etc. His successor Seymour Lubetzky acknowledged that Panizzi has laid cornerstone for modern cataloguing. Panizzi, according to Lubetzky, was not merely the conceiver of the Rules but had other qualities also. In Chapter 3 of the Cataloging Rules and Principles, titled 'Design for a Code', Lubetzky displays his close scrutiny of Panizzi's rules[2].

The contribution of Seymour Lubetzky has been important whose contribution to Paris Principles and ALA Rules was highly acknowledged. Lubetzky wrote 'Manual of Descriptive Cataloguing'; Preliminary Draft published in 1943[3] and 'Code of Cataloguing Rules Author and Title Entries, 1960'[4]. His work was key to 1949 Rules for Descriptive Cataloguing in the Library of Congress also adopted by American Library Association[5].

Lubetzky stated that "complete reconstruction of rules is necessary based upon the objectives which should be implicit in our rules for entry. He divided the objectives into two. The first objective is to enable the user of the catalog to determine readily whether or not the library has the book he wants. The catalogue is constantly searched by many readers and members of the staff and the quicker this information can be found better the catalogue. The second objective is to reveal to the user of the catalogue, under one form of the author's name, what works the library has by a given author and what editions or translations of a given work[6]. He meant that catalogue should bring all the works (along with their expression and manifestation) of the author at one place for the convenience of the users. He was the first who gave the idea of descriptive catalogue which is now being emphasised in modern cataloguing codes. He had listed the following functions of the descriptive catalogue:

(i) Describe the title of the book

(ii) Describe the particular edition to which the book belong

(iii) Describe physical makeup of the book

(iv) Describe bibliographical relation of the book, and in special case

(v) Describe special features of the particular copy in hand[7].

His concept of descriptive catalogue was a vision for the future cataloguing. He had anticipated the importance of bibliographical relation which is a key concern in modern cataloguing when today Functional Requirements for Bibliographic Records (FRBR), Resource Description and Access (RDA) and semantic web are hot topics for consideration and implementation.

The Charles Ammi Cutter (1937-1903), who was an important figure in librarianship, not only developed 'Rules for Dictionary Catalogue' (RDC) but also designed 'Expansive Classification', and 'Three Figure Author Table' (Cutter Number). His 'Rules for a Dictionary Catalogue' was first published in 1876 which appeared in the same report that unveiled Dewey's Classification scheme[2]. Last edition of Cutter's 'Rules for a Dictionary Catalogue' was published in 1904[8]. Cutter considered catalogue as an important searching tool which can show as to what resources the library has to satisfy user's

approach by author, title, subject. His objectives of a library catalogue is highly cited by all authors writing on cataloguing. SR Ranganathan had all admiration for Cutter's Rdc. He states that Rdc was the first code to reach beyond those limitations (which were in earlier codes). He only pointed out its limitation in the linguistic context. He acknowledged his contribution stating that the "library profession has been fortunate in the author of this code. He was a genius. This is seen in the ring of certitude and the profoundness of penetration found in the rules and commentaries of Rdc. Rdc is indeed a classic"[9]. Ranganathan's comment on Rdc has a special significance who was a believer of logical system and approach.

After Cutter, it was SR Ranganathan, who published Classified Catalogue Code with Additional Rules for Dictionary Catalogue (CCC) in 1934 as a revolt to the existing catalogue rules and codes deserves special mention in the context of recent development in the field of cataloguing[10]. He was not satisfied with the existing catalogue codes, despite his admiration to Rdc. He was quite critical of AACR which was first time published in 1908 based upon Panizzi-Cutter mould[11] and commented that each rule of the Anglo-American Code was taken by itself to be put into rote-memory as it were. There was no attempt to present the rules as a system[10]. Ranganathan[10] conceived catalogue as a tool to comply with the message of his famous Five Laws of Library Science[12] and stated that catalogue should be designed to:

(i) Disclose to every reader his or her document

(ii) Secure for every document its reader

(iii) Save of the time of the reader; and for this purpose

(iv) Save the time of the staff.

Applying Cutter's line of approach he restated the purpose in a more specific way:

(1) Enable a person to find a book of which either the
   (a) Author, or
   (b) Title, or
   (c) Subject is known;

(2) Show what the library has
   (d) By a given author,
   (e) By a given subject, and
   (f) In a given kind of literature; and

(3) Assist in the choice of a book as to its:
   (g) Edition, and
   (h) Character.

The CCC was based upon logical approach of the users to the resources. His canons and principles have relevance even today when RDA, FRBR, FRAD, and metadata standards are being discussed. His 'Canon of Ascertainability' which states that source of information for cataloguing should not be confined to title page only but cataloguer may refer to the overflowing pages and other sources for the purpose, in the absence of adequate information available on the title page. Assessment of users' approach to catalogue is of paramount importance and all access points given in the catalogue should meet their requirements. Keywords and subject descriptors must be assigned keeping in view the user group being served. This is what 'Canon of Sought Heading' prescribes and gives direction to the cataloguer. The canon prescribes that cataloguer should ask himself 'Is reader (user) or library staff likely to look for a book (any resource) under the particular type or choice or rendering of heading or in a particular added entry?'[10] Cataloguer should ask himself before assigning keyword or subject heading that these headings or access points being identified and described in the catalogue have probability of being searched. His other canons; 'Canon of Permanence', 'Canon of Currency', and 'Canon of Consistency' are still guiding principles for cataloguing including in creation of metadata. Both Lubetzky and Ranganathan believed in making catalogue as simple as possible but meeting the requirements of both users and library staff. Ranganathan perception was that catalogue should satisfy all possible approaches of users and it should be as simple as possible, saving the time and efforts of both the cataloguer and user. He could visualise that physical description like collation and imprint except in special documents is not important from users' point of view. AACR-2, team also realised this and deleted rule 1.4.D4, stating that shortest possible form in the publication, distribution, etc., area should be given, as the elaborated information does not play any role in searching and retrieval[13]. He had also realised as a teacher of cataloguing that bibliographical details about format, collation and imprint were over emphasised in practical class. How many users search a book which should have X number of pages, published by a particular publisher, having illustration? Nevertheless, such information at times may be required by the library staff. His concept of individualisation of persons or corporate body owning the responsibility for the creation of thought which he does by giving year of the birth of author and if ascertainable year of death and other individualising elements, which now RDA principles are also accepting and adopting under the 'principles of differentiation' where data describing a resource should differentiate that resource from other resources. His 'Canon of individualisation' states that heading of a catalogue entry should be made to denote one and only one entity, by

adding to it the necessary and sufficient number of individualisation elements[10]. He had evolved special device for individualisation of authors having produced the same work through his Book Numbers given in his colon classification[14].

The main problem today in cataloguing is assigning appropriate subject headings or keywords. Present users depend more on keyword search, and assigning befitting subject descriptors or keywords matching with the users approach. Cataloguer has a challenging task of subject analysis which requires subject knowledge of various discipline in addition to having cataloguing skill. In one of the surveys of directors, the professionals felt that MARC, LCSH, and AACR are irrelevant in context of keyword searching and thesaurus. They suggested that indexing and metadata should be more emphasised than traditional cataloguing[15]. Ranganathan was very much aware of this problem of indexing, that is why he devised chain procedure indexing method which derives class index entries from class number, in a more or less mechanical way. Chain procedure is used to derive class index entries in a classified catalogue and specific subject entries, subject analytical, and 'see' and 'see also' subject entries in dictionary catalogue[10]. He was in the opinion of having economy in cataloguing in terms of time and efforts. Under 'Law of Parsimony', he states that overall economy of manpower, material, money, and time should be saved. In view of this he had devised chain procedure[9] for deriving subject headings providing multiple access points in an automatic way also revealing relationship among them.

What RDA and modern cataloguing is striving today is to establish relationship of coordinated subjects and provide integrated approach to as many resources as possible. This is what classified part of catalogue has been able to achieve. The FRBR and RDA talk about collocating resources, establishing bibliographical and whole part relationship which Ranganathan was able to establish through classified part of the catalogue where entries are arranged strictly according to the relationship among entities. Finally, the era of individual contributors came to an end, and revision of rules and principles was taken over by professional bodies.

In 1967, Anglo-American Cataloguing Rules (AACR) was published in British and American edition which was revised as AACR-2 in 1978. There were several revision and amendments and updating of rules over the years till 2005[16]. Joint Committee for Revision of AACR was constituted which has been actively engaged in bringing out changes in the rules from time to time to mee the challenging needs of users in a new environment of electronic age.

3. FRBR MODEL

This is a conceptual schema of database based upon entity-relationship to provide greater flexibility in manipulating bibliographic data and offering better information to users as they navigate … catalog[24]. This was developed by IFLA Study Group which worked from 1992-1995 to develop this model indented to be independent of code. Basically, this is an analytical technique that can be used to identify and describe the entities. Relationship represents the association or connections among entitites[17]. The FRBR are defined in relation to the following generic tasks that are performed by users when searching and making use of national bibliographies and library catalogues:

- Using the data to find materials that correspond to the user's stated search criteria (e.g., in the context of a search for all documents on a given subject, or a search for a recording issued under a particular title);
- Using the data retrieved to identify an entity (e.g., to confirm that the document described in a record corresponds to the document sought by the user, or to distinguish between two texts or recordings that have the same title);
- Using the data to select an entity that is appropriate to the user's needs (e.g., to select a text in a language the user understands, or to choose a version of a computer program that is compatible with the hardware and operating system available to the user;
- Using the data to acquire or obtain access to the entity described (e.g., to place a purchase order for a publication, to submit a request for the loan of a copy of a book in a library's collection, or to access online an electronic document stored on a remote computer[18].

The model uses terminology like entity, work, expression, manifestation, and item to show the relationship among them. The relationship is shown among three groups as given in fig. 1-3 taken from Final Report of IFLA Study Group on the FRBR.

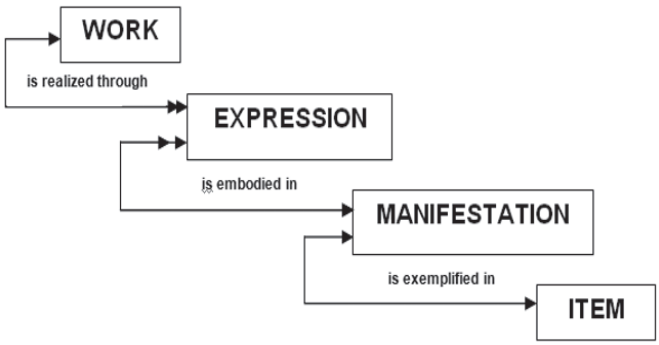

Figure 1. Group 1–Entities and 'Primary' relationship.

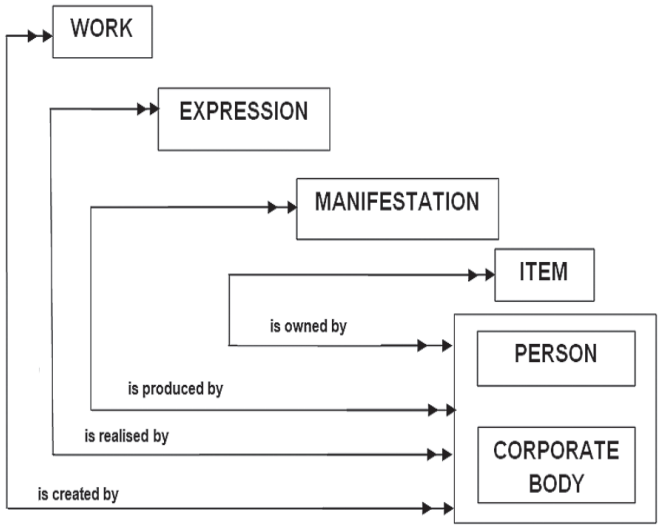

Figure 2. Group 2–Entities and 'Responsibility' relationship.

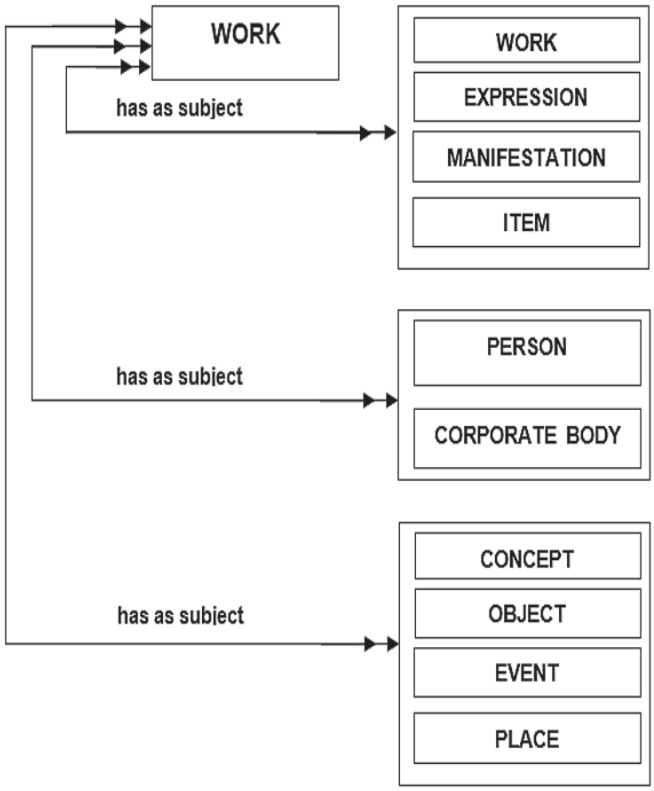

Figure 3. Group 3–Entities and 'Subject' relationship.

The relationship among three groups is:
Group 1- Entities and primary relationship,
Group 2- Entities and responsibility relationship, and
Group 3- Entities and subject relationship

In the first group, entity is defined as work as intellectual or artistic endeavor or creation and intellectual or artistic, realisation of work is an 'Expression' of a work, physical embodiment of an expression is 'Manifestation' of work. There can be more than one manifestation of a work in the form of printed version, e-version, video tape, etc. If new version is based upon the original work, but its adaptation is with intellectual contribution brining newness in the work, in that case it becomes 'New manifestation'. Item is defined as single physical object which may be produced in a more than one form like a book in the form of printed version as well as in compact disk, paperback or any other form.

The objective of FRBR is to establish entity-relationship, linking or collating expressions, manifestations with the work to provide integrated approach to related resources created by a person or corporate body. The work which is being described should reveal its relationship with other related resources. This analysis and capturing data to achieve aforesaid objective is difficult job for the cataloguer/metadata creator.

'Entities' in the second group represent those who are responsible for intellectual and artistic content, the physical production and dissemination, presentation, narration, etc., these are person and corporate body. One person or corporate body may produce more than one work; similarly a work can be created by more than one person or corporate body. Work so created may have more than one expression and manifestation. An item may be owned by one or more than one person or corporate body, and a person or corporate body may have more than one item. This relationship among entities could be one to one, one to many, or many to many as in database system design[19].

In the group third, entities represent 'Concepts', 'Objects', 'Event Places' to be treated as subjects of work. This is almost similar to five fundamental categories of a subject and facet analysis used by Ranganathan in his Colon Classification[14]. Work (subject) may have more than one concept, object and/or place, more than one manifestation, item, person and/or corporate body. Ranganathan combines these multiple concepts through round and levels. The book/work has many attributes within it; like its physical description, ISBN, form like compact disc, paperback, etc., called 'Manifestation'. The work may be translated into other languages, adapted, abridged which also can be brought out in different forms like editions, adaptation and abridgement, etc., which are termed as 'Expression' in FRBR terminology.

In the present electronic environment, traditional cataloguing is no more in use. The concept of main and added entry, use of punctuation marks, dividing catalogue into indentions don't play any role. Neither the specific structure nor the display of the catalogue is required any more. In the present context, some of the practices of AACR were found irrelevant so were dropped in RDA.

4. RDA AND COMPARISION WITH AACR-2

The RDA is a new code developed for detailed description of various information resources (old and newly emerged works) with emphasis on entities' relationship with their attributes as laid down in the conceptual model of FRBR. Instead of naming the revision as AACR-3, it has been named as RDA, giving emphasis on description of various elements of the records. The AACR has been undergoing various revisions and amendments from time to time mainly due to emergence of new medium of information and changing information seeking behaviour of users. Cataloguing Section of IFLA has been continuously working on cataloguing standards and rules which finally developed the model for description of resources. The RDA is a resource discovery tool based upon metadata creation, aiming at collating related resources which Cutter and Ranganathan had much earlier thought of. It can be considered as a database management system, based upon certain principles of recording description of resources and make them access. Some of the practices of AACR such as main, entry, added entries, indentions, display format, etc., have no relevancy in the present computer age in which every descriptive element of a catalogue is searchable. The prospectus of RDA states that 'it [RDA] is being developed to provide better fit with emerging technologies… 'and 'the aim is to provide a set of instructions for recording data that can be applied independently of any particular structure or syntax for data storage and display'[18]. The data created using RDA to describe a resource are designed to assist users performing the following tasks[20]:

Find: to find resources that correspond to the user's stated search criteria;

Identify: to confirm that the resources described corresponds to the resources sought, or to distinguish between two or more resources with similar characteristics;

Select: to select a resource that is appropriate to the user's needs; and

Obtain: to acquire or access the resource described.

With this view, RDA was conceived not only to assist the users in finding, identifying, 'Selection' but they need to be helped in acquiring resources described which is possible by consulting catalogues of other libraries as selection tool. It seems that the task of RDA is much beyond the scope of traditional cataloguing. It would be relevant here to know the main difference between RDA and AACR-2 and note the important additions and deletions made in RDA. The difference is shown in Table 1.

Table 1. Comparison of AACR-2 and RDA[21,22]

Features	AACR-2	RDA
Source of information for cataloging	Title page was recommended as main source	May go beyond title page to capture information for recording
More than three Authors Rule	When more than 3 authors have the same function, give only the first name followed by "… [et al.]"	This rule has been dropped where more than three authors also can be entered. Option of continuing with three author rule is also given. In place of *et al.* [and 3 other]
Inaccuracy	Could be corrected, e.g., Will[i]am which was wrongly spelled as Willam. Correction made was being shown as [sic].	To be inscribed as such. However, correction if any could be shown in variant title.
General Material Designations (GMD)	In traditional cataloguing where computerised cataloguing is being done, GMD does not play much role and AACR-2 was more inclined towards manual cataloguing without any provision of creating metadata.	Terminology used in AACR have been changed with addition of new types of material divide into three new types; content type, media type and carrier type which are being explained under RDA elements later paragraph.
Copyright data and physical description	Copyright data was shown by small c., e.g., c1989, many abbreviations like p. iii. v. pkb were in use ,	Abbreviations were dropped and full form was preferred, like pages, volumes, illustrations, paperback, etc.
Individualising element		Included date of birth of person, titles, occupational titles as compliance to Principle of differentiation which Ranganathan had covered in his canon of individualisation.
Recording of publisher and place of publication if not known	Abbreviations of [*s.l.)* and [*s.n]* used to be the practice to show the absence of place of publication and publisher respectively.	Replaced with: [Place of publication not identified] and [Publisher not identified].
Level of description	There were two levels of description with limited number of descriptive elements.	Number of more descriptive elements were added, some of them for entity-relationship.

In addition to the differences mentioned in Table 1, some minor differences can be noted which have least effect on cataloguing practice. It should also be pointed out here that regular users of catalogue had become familiar with the old practices and did not have much difficulty in resource finding and understanding abbreviations being used in AACR, though full-form of abbreviations are better understood which has been adopted in RDA but violation of economy principle.

Addition of more descriptive elements, and making RDA compatible with international practices like ISBD and MARC and establishing links among related resources by application of entity-relationship may prove useful. The RDA has added more core element for metadata creation like 'Production statement', 'distribution statement', 'manufacturing statement', 'carrier type', 'extent' and many type of description like comprehensive, analytical and hierarchical. Some of the RDA elements[23] are mentioned in Table 2.

due to the advent of computer and emergence of new information resources in different types and formats. Different study groups particularly IFLA Study Group and associations started working on revision of code to cope with the changing scenario. Library software also started developing cataloguing modules compatible with international standard like MARC format and Z39.50. As a consequence, the long era of physical form of catalogue came to an end which was taken over by computerised catalogue. AACR has been more in use since 1967 internationally which underwent various revisions and amendments, finally incorporated in AACR-2 (Ed. 2). It was further realised that AACR-2 also needs revision which was brought out as RDA. The main difference of RDA from AACR is that latter is based upon creation of metadata structure identifying such fields that are capable of establishing entity-relationship as elaborated earlier. It is the description part of cataloguing which is important. Access points are automatically generated from the

Table 2. RDA elements for audio recording book

RDA REF	RDA element	Data recorded
2.13	Mode of issuance	Multiple part of monograph
2.15	Identification for manifestation	ISBN NO.
3.2	Media type	Audio disc or CD
3.3	Carrier type	Audio disc
3.4	Extent	3 audio discs
6.9	Content type	Spoken words, performed music
7.3	Performer, narrator, presenter	
17.8	Work manifested	Munro, Alice (1931) - Lives of girls and women
18.5	Relationship designator	Author, abridger, translator, adaptor
25.1	Related work	Information technology
26.1	Related expression	Abridgement of …, translation of…
27.1	Related manifestation	Originally broadcast on AIR

It is evident from Table 2 that RDA has added descriptive elements some of them are not even available in MARC-21. The above example shows as to how RDA establishes entity-relationship by creating new fields in the data structure.

5. CONCLUSIONS

Journey of cataloguing had started with the British Museum Catalogue since 1841. However, systematic cataloguing based upon rules and principles began with Panizzi, continued by Lubetzky, Cutter, and Ranganathan before it was taken over by professional associations and bodies like American Library Association, British Library Association, Canadian Library Association, and IFLA. Journey began with the card catalogue and finally reached virtual world of online catalogue. In the beginning, emphasis was on simplified catalogue with brief description as per requirement of users of that time. Cataloguing scenario had a drastic change

descriptive elements which should correspond to the users' approach. The RDA has identified new fields which can accommodate more attributes of entities and relate them with other related resources termed as 'Manifestations and Expressions'.

The RDA has its foundation on the principles of its predecessor AACR, of course with some added features 'with an effort to attain an effective level of alignment between RDA and metadata standard used in those communities[21] (archives, museum, publishers, etc.) and is not radical to break the past[24]. Barara Tillett[25] considers RDA as bridge that strives to connect our past with our future. Michael Gorman has observed that the sad thing is that (it is) betraying the former (AACR) has not managed to appease the latter (RDA)[26].

How far libraries would be able to adopt RDA over the well established practices of AACR which has been in use over more than five decades is doubtful, however, important libraries like LC, NAL,

NLM have already announced its adoption. Everything will depend upon the professional reactions after its release on 31-03-2013 as announced. Almost all modern libraries are using library software like VTLS, Liberty, etc., having excellent modules of cataloguing which are already having some of the features of RDA with flexibility and compatibility with international standard. Will such libraries prefer to switch over to RDA from their system in use? Only future will tell. What is important in the present environment is analysis of attributes of entities and describe and record them in such a way that relationship among them could be established and linked. Description dominates the access points, as many access points are implicit in description part only. Everything depends upon creation of metadata, database design and the capability of the cataloguer. Establishing relationship among works and coordinating them with their manifestation and expression is of course going to be a useful feature. Now the question is whether the objectives laid down in RDA are not achievable without its adoption or such features can be introduced in the existing practices by doing some customisation and modifying of present data structure in use. Now, wait is not long, and let's see what RDA toolkit brings to the profession.

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