Application of the FRBR and RDA to Audio Visual Materials for Discoverability and Bibliographic Records

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Abstract: *Functional Requirements for Bibliographic Records (FRBR) is a conceptual model of the bibliographic universe to describe entities, relationships and attributes (i.e., metadata) associated with each of the entities and relationships, and it proposes a national level bibliographic record for all of the various types of materials. It also reminds us of user tasks (find, identify, select, obtain) described in catalogs, bibliographies, and other bibliographic tools. The paper describes work applying the FRBR model to audio-visual material, as the basis for implementing a fully FRBR compliant digital library and achieve system. A detailed analysis of the FRBR and Functional Requirements for Authority Data (FRAD) entities and attributes is presented for audio visual (A-V) materials. Description and access of content contained on time-based media has been a daunting challenge for many decades. This has been particularly difficult in the case of original and unique moving image and recorded sound material within libraries and archives, and are challenging for all users to access. A data model that supports the needs of A-V resources must allow for the description of content and carriers in a way that supports collection management, captures the salient characteristics of the media, describes the content appropriate to user needs, and yet is flexible enough to apply to description and discovery of materials. Resource Description and Access (RDA) is a set of cataloging instructions based on FRBR and FRAD. It could be considered hierarchical work-centric models, in that they identify work as the top-most entity applicable to a resource's description.*

Keywords: FRBR, FRAD, RDA, metadata, bibliographic universe, Resource description

1. Introduction

An Audio-Visual work is composed of sound, sequence of pictures or both. A-V works include motion pictures, videos, audiocassettes, CDs, DVDs, etc. A-V should not be confused with multimedia which may include several types of A-V materials, but has different guidelines. Functional Requirements for Bibliographic Records (FRBR) is a conceptual model of the bibliographic universe to describe entities, relationships and attributes (i.e., metadata) associated with each of the entities and relationships, and it proposes a national level bibliographic record for all of the various types of materials. It also reminds us of user tasks (find, identify, select, obtain) described in catalogs, bibliographies, and other bibliographic tools. Description and access of content contained on time-based media has been a daunting challenge for many decades. This has been particularly difficult in the case of original and unique moving image and recorded sound material within libraries and archives, and are challenging for all users to access. A data model that supports the needs of A-V resources must allow for the description of content and carriers in a way that supports collection management, captures the salient characteristics of the media, describes the content appropriate to user needs, and yet is flexible enough to apply to description and discovery of materials. Resource Description and Access (RDA) is a set of cataloging instructions based on FRBR and FRAD. It could be considered hierarchical work-centric models, in that they identify work as the top-most entity applicable to a resource's description. RDA provides instructions on the construction of authorized and variant access points representing works, expressions, persons, families, and corporate bodies.

1) Audio Visual Materials

Audio Visual Material According to The Librarian Glossary (1987) defines Audio visual materials "as non-book materials like tapes, slides, films which are renewed and recent to rather then read as books." This definition excludes books and all reading materials.

Dike (1993) defines them as those materials which do not depend solely upon reading to convey meaning. They may present information through the sense of hearing as in audio resources, sight, as in visual resources or through a combination of senses. Dike's definition pinpoints the wide variety as a striking characteristic.

Webster's Encyclopeadia Unabridged Dictionary of the English Language (1994), defines Audio-Visual Aids as "training or educational materials directed at both the senses of hearing and the sense of sight, films, recordings, photographs, etc. used in classroom instructions, library collections or the likes." According to Anzaku (2011) "the term audio-visual material is used to refer to those instructional materials that may be used to convey meaning without complete dependence upon verbal symbols or language".

According to SP Ahluwalia "Audio-visual materials reinforce the spoken and the written words with concrete images and rich perceptual experiences which are basis of learning. Reduce the boredom of teaching in classes." Experts in the field have also given different definitions of audio-visual aids Edgar Dale (1946) asserted that Audio-visual aids are termed as multisensory devices used to communicate of ideas between persons and groups in different teaching and training situations.

2) FRBR and RDA

Functional Requirements for Bibliographic Records (FRBR) offers us a fresh perspective on the structure and relationships of bibliographic and authority records of universal entities, and a more precise vocabulary to help future cataloging rule makers and system designers in meeting user needs and demands. It is a conceptual model of the bibliographic universe to describe entities, relationships, and attributes (i.e., metadata) associated with each of the entities and relationships, and it proposes a national level bibliographic record for all of the various types of materials. International Federation of Library Associations and Institutions (IFLA) continues to monitor the application of FRBR and promotes its use and evolution. FRBR is an entity-relationship model framed by IFLA in 1998. The model represents a generalized view of the bibliographic universe. This conceptual model is based on entity analysis technique to isolate key objects that are of interest to users of bibliographic records. The entity relationship structure derived from the analysis of bibliographic entities, attributes and relationships has been used in FRBR as the framework for assessing the relevance of each attribute and relationship to the tasks performed by users of bibliographic data.

3) Entities-Relationship Model:

In FRBR model, the entities of bibliographic universe have been divided into three groups:
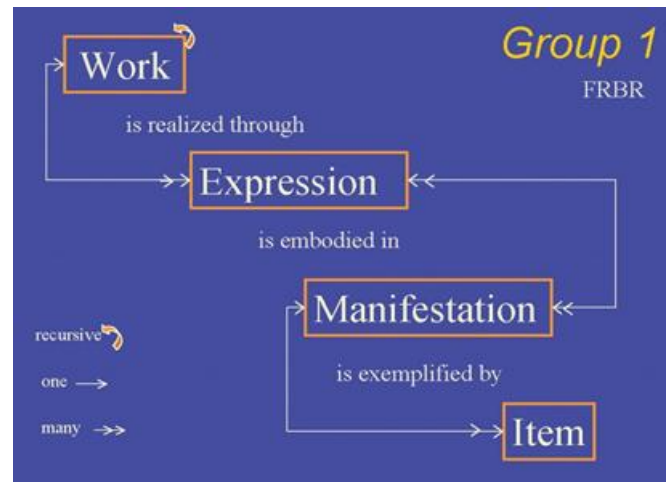
- The first group includes the products of intellectual or artistic endeavour;
- The second group comprises those entities responsible for the intellectual or artistic content; and
- The third group identifies entities that serve as the subjects of intellectual or artistic endeavour.

Group I Entities- Primary Relationship

The entities of this group represent the different aspects of user interests in the products of intellectual or artistic endeavour. These are:

- Work: A distinct intellectual or artistic creation;
- Expression: The intellectual or artistic realisation of a work;
- Manifestation: The physical embodiment of an expression of a work; and
- Item: A single exemplar of a manifestation.

The first two entities reflect intellectual or artistic content and last two entities reflect physical forms. The following diagram represents the relationships among entities of the first group as given in FRBR:


Picture 1: Group 1 Entities and Primary Relationships of FRBR
(Source: https://www.loc.gov/cds/downloads/FRBR.PDF)

Group II Entities- Responsibility Relationship

The entities in the second group represent those responsible for the intellectual or artistic content, the physical production and dissemination, or the custodianship of the entities in the first group. The entities in this group include person (an individual) and corporate body (an organisation or group of individuals and /or organisations). The type of 'responsibility' relationships that exist between entities in the second group and the entities in the first group may be represented as in Pic 2.
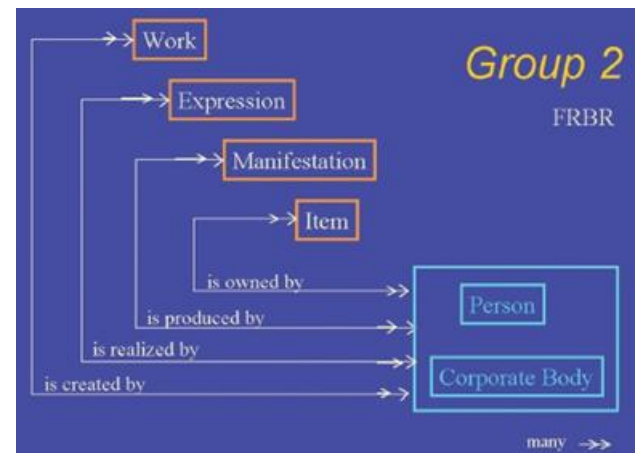

Picture 2: Group 2 Entities and 'Responsibility' Relationships
(Source: https://www.loc.gov/cds/downloads/FRBR.PDF)

Group III Entities- Subject Relationship

The entities of this group represent an additional set of entities that serve as the subjects of works. It includes concept (an abstract notion or idea), object (a material thing), event (an action or occurrence), and place (a location). Picture 3 shows the 'subject' relationships between entities in the third group and thework entity in the first group and also relationships between work and the entities in the first and second groups. The diagram indicates that a work may have as its subject one or more than one work, expression, manifestation, item, person, and/or corporate body.
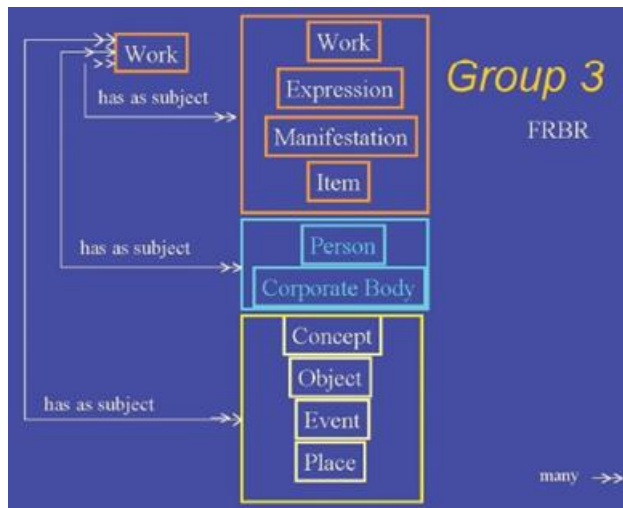
Picture 3: Group 3 Entities and 'Subject' Relationships
(Source:
https://www.loc.gov/cds/downloads/FRBR.PDF)

FRBR and RDA could be considered hierarchical work-centric models, in that they identify work as the top-most entity applicable to a resource's description. "Resource Description and Access (RDA)[1] is the new standard for descriptive cataloging providing data elements, instructions, and guidelines on recording the contents and formulating bibliographic metadata for description and access to information resources covering all types of content and media held in libraries and related cultural organizations, such as museums and archives. RDA is designed for the digital world."

'By definition FRBR and RDA envision that expression descriptions would inherit from their associated works, and therefore at the work level provide attributes that would be shared amongst all expressions of the same work. These work level attributes include date, intended audience, history of the work, relationships to the primary creator, subject headings, and relationships to expressions. In RDA, the expression entity does not allow for the inclusion of information such as title or subjects, as these would be described at the work level. The expression entity does provide the opportunity to give details about the particular realization, which for audiovisual materials could include content type, duration, language (which is not permitted at the work level), and whether or not there is sound in the case of motion picture films. Relationships to persons, families or corporate bodies at the expression level are used to describe contributors to the expression beyond the primary creator. It is notable that RDA does consider certain performances as types of expressions, providing a content type vocabulary that includes performed music, sounds, and spoken word. However, this model strictly limits these types to expressions of works. As will be demonstrated, RDA does not provide any recommendation for descriptions of "live" expressions when they are not embodiment of works in the formal sense, but another type of content. The issue of expression of non-work content will be further explored throughout the report.'[2]

Resource Description and Access (RDA): Resource Description and Access (RDA) is a standard for descriptive cataloging providing instructions and guidelines on formulating bibliographic data. Resource Description & Access (RDA) is a set of cataloging instructions based on FRBR and FRAD, for producing the description and name and title access points representing a resource. RDA offers libraries the potential to change significantly how bibliographic data is created and used. RDA is a standard for resource description and access designed for the digital world.

- RDA is better at catering for digital resources and for resources with multiple characteristics and will provide more guidance on the creation of authority headings.
- RDA has been developed with the end-user in mind.
- RDA provides a consistent, flexible and extensible framework for the description of all types of resources, including digital resources and those with multiple characteristics.
- RDA is compatible with internationally established principles, models, and standards.
- RDA is compatible with a range of encoding schemas, such as MODS, Dublin Core, ONIX and MARC. It will allow library bibliographic records to be integrated with those produced by other metadata communities, and to move into the digital environment beyond library catalogs.
- RDA will enable, with systems support, the grouping together of bibliographic records for different editions, translations or formats of a work, to achieve a more meaningful display of data for users.
- RDA is a Web-based product, which enables catalogers to move between related instructions using hyperlinks and to integrate their own institutional policies.
- RDA is a transitional stepping stone that requires only small changes to catalog records but moves the metadata in catalogs much closer to full utilization of FRBR models.

2. Review of Literature

A Review of literature is intended to endow the researcher with pertinent information as to formulate a sound research design and make legitimate decision regarding tools for the successful completion of the study. It provides a foundation for conceptual is framework, insights into methods and procedures, suggests operational definitions of major concepts and also throws light on interpretations of findings.

Hillmann and Others (2010) says about the Resource Description and Access (RDA) standard, due to be released this coming summer, has included since May 2007 a parallel effort to build Semantic Web enabled vocabularies. This article describes that effort and the decisions made to express the vocabularies for use within the library community and in addition as a bridge to the future of library data outside the current MARC-based systems. The authors also touch on the registration activities that have made the vocabularies usable independently of the RDA textual guidance. Designed for both human and machine users, the registered vocabularies describe the relationships between FRBR, the RDA classes and properties and the extensive value vocabularies developed for use within RDA.

Newcomer and Others (2013) says about RDA models of music materials, particularly scores and recordings, pose

unique demands that must be considered for their successful discovery. Some of the discoverability challenges of music materials in public search interfaces can be addressed simply by ensuring that needed bibliographic description fields are appropriately displayed and indexed in discovery interfaces. Other problems are more difficult to solve. This Music Discovery Requirements document explores the issues and gives concrete recommendations for discovery interfaces. Given that most libraries will be dealing with databases containing large bodies of legacy data recorded according to AACR2 and encoded in MARC, particular attention is paid to MARC data and to AACR2; RDA is addressed to the extent possible. The discussions and recommendations will be useful to those creating or guiding the development of discovery interfaces that will facilitate access to music materials. Furthermore, because the document identifies areas where deficient data create particular problems for discovery, those inputting or creating standards for data can use this document to identify areas with particular needs for fuller, more consistent data.

Kalwara, J., Dale, M., & Coleman, M. (2017) says in their paper explores the benefits of establishing item-specific terms for General Material Designations (GMDs) for library consortia implementing Resource Description and Access (RDA). While RDA includes a new approach towards the description and categorization of an item's physical medium through the assignment of content, media, and carrier types (CMCs), thus replacing the GMD, libraries may still benefit from GMD retention in their online catalogs to help support user tasks and help contextualize CMC information. This paper presents the challenges that Mississippi State University Libraries experienced in leading RDA enrichment for the Mississippi Library Partnership (MLP) consortium. Additionally, it discusses parameters for libraries to consider when working with a vendor for RDA enrichment in a consortial environment.

Alemu & Garoufallou (2020) mentioned with the growing diversity of information resources the emphasis on data-centric applications such as big data, metadata, semantics and ontologies has become central. This editorial paper presents a summary of recent developments in metadata, semantics and ontologies - focusing in particular on metadata enriching, linking and interoperability. National libraries and archives are devising new bibliographic models and metadata presentation formats. Bibliographic metadata sets are being made available using these new data formats such as RDF. The new formats are aiming to represent data in granular structures and define unique identification protocols such as URIs. The paper concludes by introducing the five papers included in the special issue. The papers in this special issue present novel approaches to metadata integration, interoperability frameworks, re-use of metadata ontologies and methods of metadata quality analysis.

Doyle (2015) mentioned in his paper that over the past few years, the cataloguing community has seen radical changes in cataloguing standards, changes which appear to have been largely ignored by legal information professionals. This is a mistake according to Helen Doyle; the new cataloguing model can have enormous implications for the legal community, particularly in the spheres of information and

knowledge management, and the profession is missing a huge opportunity by ignoring it. A new cataloguing standard (RDA) has been developed based on an alternative theoretical approach, known as "Functional Requirements for Bibliographic Records" (FRBR). FRBR seeks to change the way we approach the bibliographic universe: from stand-alone, individual repositories of information to networks of linked data built on a structured hierarchy. Commercial law firms are constantly trying to make connections between their traditional resources, online repositories, internal know-how, etc, but struggle to achieve complete synchronicity. FRBR provides a solution to this knowledge management problem: all resources (including people, events and subjects) become searchable, and because everything is linked, users can access information by navigating to it, establishing their own pathway through the data. Moreover, the major legal databases are already utilizing linked data in this way – it is time for law firms to catch up.

Newcomer (2013) mentioned that "Discovery" has become a library buzzword but it refers to a traditional concept: enabling users to find library information and materials. Today, the discovery environment is changing rapidly both within libraries and externally. In the midst of this changing environment, music materials pose unique demands that must be considered for successful discovery. There is exciting potential for new discovery interfaces to ease the difficulties users face when searching for music materials. However, in reality, the specialized discovery needs arising from music materials are often overlooked. Some of the discoverability challenges of music materials in public search interfaces can be addressed simply by ensuring that needed bibliographic description fields are appropriately displayed and indexed in discovery interfaces. Other problems are more difficult to solve. To guide music librarians and others facing these challenges, a group of United States music librarians created the Music Discovery Requirements document (http://committees.musiclibraryassoc.org/ETSC/MDR) which explores and outlines these issues, including examination of important FRBR attributes and relationships, examination of other factors in music discovery, and specific recommendations for meeting these challenges. Beginning from the Music Discovery Requirements, this presentation will explore the issues surrounding music discovery, providing a birds-eye view of some of the most pressing issues and possibilities for solving them. The presentation will be useful to those creating or guiding the development of discovery interfaces that will facilitate access to music materials. Furthermore, because the presentation will identify areas where deficient data creates particular problems for discovery, those inputting or creating standards for data can benefit by identifying areas with particular need for fuller, more consistent data.

Newcomer and Others (2013) mentioned that music materials, particularly scores and recordings, pose unique demands that must be considered for their successful discovery. Some of the discoverability challenges of music materials in public search interfaces can be addressed simply by ensuring that needed bibliographic description fields are appropriately displayed and indexed in discovery interfaces.

Other problems are more difficult to solve. This Music Discovery Requirements document explores the issues and gives concrete recommendations for discovery interfaces. Given that most libraries will be dealing with databases containing large bodies of legacy data recorded according to AACR2 and encoded in MARC, particular attention is paid to MARC data and to AACR2; RDA is addressed to the extent possible. The discussions and recommendations will be useful to those creating or guiding the development of discovery interfaces that will facilitate access to music materials.

Sustainability of AV Materials for Access

Libraries have been around for centuries, and so has their model for loaning and sharing access to resources. This approach is arguably one of the earliest recorded means for reducing and reusing materials. Instead of having multiple people buy individual copies of a documents, libraries offer a sustainable alternative where communities can share access to the same resources. In addition, a communal appreciation and respect for libraries ensures that patrons take good care of the resource they do borrow, extending the lifetime of a given resource. So, if we tagging the AV materials as more as it possible, then it must be sustainable for future. RDA provides instructions on the construction of authorized and variant access points representing works, expressions, persons, families, and corporate bodies.

RDA also provides instructions on the use of authorized access points to records the following types of relationships:

- Primary relationship between a manifestation and a work or expression embodies in the manifestation.
- Relationship between a resource and persons, families, and corporate bodies associated with that resource.
- Relationships between a work and its subject.
- Relationships between works, expressions, manifestations, and items.
- Relationships between persons, families, and corporate bodies

In addition, RDA provides guidance on the use of titles (title proper, parallel title, variant title, etc.) as access points. RDA does not provide guidance on the use of other data elements as access points. Agencies using RDA data may determine which additional elements are to be indexed based on the needs of their users and the capabilities of their data management systems.

3. RDA representation for Musical Works

Musical Works

1) **Introduction:** Clear identification and display of information regarding the musical work is important to users. The following section addresses attributes of musical works which are important to users, as well as the "created by" relationships which link persons and corporate bodies (most often persons) to works and the "has as subject" relationship linking various entities to works (under the heading "topical subjects").
2) **Titles:** Users' discovery and identification of musical works frequently draws on title, often in conjunction with creator. Particular musical works are often referred to by many different titles in various languages, for example: Symphony no. 5, Fifth Symphony, Sinfonie

C-Dur, Symphonie op. 67, etc. This reality spurred librarians' extensive development and application of standardized titles (AACR2's "uniform titles") for music materials. To facilitate identification of musical works, it is crucial to display the entire standardized title, including additions to distinguish similar works and to identify particular parts/sections of the work, as well as expression-related additions. Musical works are nearly always associated with specific creators. For works with known composers, the composer's name is often essential to identify the work and distinguish it from works with the same or similar titles.

3) **Identifying Numbers:** Opus, thematic index, and serial numbers are frequently used in Western art music to identify musical works. Ideally, systems will exploit authority record data to easily lead users between different systems of numbering for composers (e.g. Vivaldi, Domenico Scarlatti) where multiple work-number systems exist. In many cases musical works lack a distinctive title and are titled only with a type of musical composition, such as "symphony." These works are often identified by the sequential number of works of that type by a given composer. These serial numbers depend on the association of the type with the number for meaning, and must display and function together.
4) **Medium of Performance:** Medium of performance is an attribute uniquely important to music. It is an identifying element for known musical works, and users also regularly seek works and expressions for a particular medium of performance, without a particular work/expression in mind at the beginning of their search. However, historically, data recording and encoding standards and practices have not made medium of performance cleanly and consistently separable from other attributes.
5) **Musical Key/Range:** Original key can be useful for identifying tonal works of Western art music, particularly when the work has a generic title and the identifying number (such as an opus, work, or thematic catalog number) is unknown, absent from the cataloging data, or wholly non-existent. Edition statements may contain information on the original key or range. The manifestation may not identify whether such statements refer to the original key/range or a transposition, so best practice is to simply include edition statements in indexing and display.
6) **Dates:** Creation date is an important, though neglected, access point for musical works. Users may seek works composed in a particular date range, which might be a specific individual year or decade, or a more broad era of music history (such as "baroque era" or "medieval era," often indicative of style). Users may also use creation date to identify the work they are seeking, particularly to distinguish it from other works with similar titles and other attributes.
7) **Persons and Corporate Bodies:** The "created by" relationship is very important for users to find, identify, and select musical works by a particular composer. Usually, the composer is a single person; more rarely, corporate bodies can serve as creators. It is important to index and display all personal and corporate names, both transcribed forms and standardized vocabulary. Once a user has identified a work created by a particular

composer, the interface should link to more materials related to that person. When the data utilize standardized vocabulary, the system should fully exploit the existing standardized vocabulary. For example, clicking on a link within a record for a work composed by John Adams the composer (Adams, John, 1947-) should locate only materials related to this person, not items related to either president or to other persons named John Adams.

8) **Topical Subjects:** True topical headings for music materials are confined to describing what music is about, but many musical works are not objectively about anything. Therefore, true topical headings are both less important and less common for music materials than for books. In FRBR terminology, true topical headings express a "has as subject" relationship. Subjects of musical works may include associated concepts, names of persons or bodies, and geographic areas (i.e. music about a geographic area, as distinguished from music emanating from a geographic area).

9) **Genre/Form:** Users regularly seek works and expressions with particular forms, genres, types, styles, etc. Up until now, these headings, which describe what musical works *are*, have been incorporated into the Library of Congress' cataloging manuals for topical subjects, and coded the same as topical subjects, using MARC 650 (bibliographic) and 150 (authority).

10) **Geographic Area:** Geographic area of musical works (the geographic area from which they emanate, as distinguished from geographic areas they are about) is a problematic and under-coded attribute. Geographic area is particularly important for music other than Western art music, and these musics have historically received the most geographic access, primarily through assignment of Library of Congress Subject Headings.14 However, these subject headings are problematic for facets and limits because they combine information on geographic locale and ethnic/national group, and often make use of subdivisions to create meaning. For example, the heading "Folk music -- Germany" is applied to folk music of Germans in Germany, of other national groups in Germany, and of Germans in other locales.

Expressions and Manifestations
1) **Introduction:** Musical works frequently exist in many expressions and manifestations,15 and users seek particular versions of works at the expression and manifestation levels. Users also seek versions with attributes which do not neatly align with FRBR expression or manifestation levels. For example: any vocal score, any arrangement for string quartet, any CD, or any recorded performance by soprano and piano.

2) **Format: Content and Carriers:** Music as a discipline depends on the use of information in different formats, including scores, sound recordings, videos, and texts. In FRBR terminology, content type (score, audio, video) is usually an expression-level attribute, while carrier type is a manifestation-level attribute. These content types, particularly recordings, exist in many different carriers, including compact disc, LP, audiocassette, videocassette, videodisc, mp3, and other formats. Users

need to be able to find, identify, and select the form of information they need. They need facets and limits that enable selection of content types, such as sound recording or video recording, as well as selection of a specific carrier, such as audiocassette, compact disc, LP, streaming sound, DVD, etc.

3) **Identifying Numbers:** Opus, thematic index, and serial numbers are frequently used in Western art music to identify musical works. Ideally, systems will exploit authority record data to easily lead users between different systems of numbering for composers (e.g. Vivaldi, Domenico Scarlatti) where multiple work-number systems exist. Whereas the ISBN and ISSN serve as uniform standard numbers for books and serials, music materials have a wide variety of numbers associated with expressions and especially with manifestations. These numbers include ISMN, ISBN, ISRC, UPC, EAN, sound and video recording issue numbers, matrix numbers, and plate and publisher numbers. Discovery systems should index and display all these associated numbers.

4) **Musical Presentation:** Users need to distinguish between various formats of notated music, such as full score, parts, vocal score, etc. This attribute does not apply to recorded performances of music. Commonly used cataloging standards and metadata formats and the legacy data encoded via these standards and formats do not provide a clear and concise way to support searching and limiting/faceting by musical presentation.

5) **Edition:** Users seek specific "editions" of notated music, meaning usually a search for a specific editor, publisher, or type of edition (critical edition, facsimile edition, Urtext edition, etc.), not (as is common with books), a search for a numbered edition statement ("2nd edition") or merely the most recent publication. Users may also scrutinize the editor, publisher, and other edition information to select a particular expression/manifestation even if they do not begin their search with a particular edition in mind.

6) **Language:** Three factors contribute to a heightened need to find, identify, and select music materials based on language attributes: the variety of languages used in the study and performance of music, the fact that a single manifestation often incorporates many languages, and the challenges of purely instrumental music.
   a) First, while general users frequently focus on one or perhaps a handful of languages (i.e. languages they read/speak), seekers of musical works regularly desire a variety of languages.
   b) Second, individual music materials regularly incorporate a number of languages in various distinct capacities, including program notes, critical commentaries, libretti, dubbing and subtitles.
   c) Finally, purely instrumental music has no language information associated with the work's primary content, yet manifestations feature an array of languages in the secondary content, making indexing and display of language problematic for instrumental music. It is unclear what users think of when considering the "language" of instrumental music.

7) **Medium of Performance:** Users may seek expressions of works with a particular medium of performance other

than the original medium, i.e. arrangements. Users may also seek music for a particular medium of performance regardless of whether it is the original medium.

8) **Musical Key/Range:** Musical key and range (complete span of pitches used in the piece of music) are particularly important for vocal music, where works frequently exist in a variety of keys and ranges, but instrumental music can also exist in expressions distinguished by the key or range.

9) **Dates:** Like musical works, musical expressions and manifestations have many associated dates. Discovery interfaces commonly allow searching, limiting, and faceting by date, most frequently exploiting publication date, which is regularly recorded in bibliographic data in an easily machine-actionable form.

   a) Creation date is associated with musical works.
   b) Performance date is an important expression-level attribute for recorded music. Users may seek particular performances, or they may use performance date to select an expression that meets their needs.
   c) Publication date is primarily important as an access point for manifestations of notated music. For notated music, creation date for the expression will often have to be approximated by the date of publication of the first manifestation of that expression.
   d) Expression date is occasionally included in standardized titles. In addition, past practice was to add the manifestation date routinely to standardized titles, and this use may still be present in some legacy data.

10) **Persons and Corporate Bodies:** In addition to the composer and librettists/lyricists, who are related to musical works, many additional persons and corporate bodies contribute to music materials and hold responsibility at the expression and manifestation levels, especially the expression level. These related persons and corporate bodies include: editor, arranger, performer (both individuals and groups), producer, and director. These persons and corporate bodies are important access points for music users for finding, identifying, and selecting their desired entity. Therefore, it is important to index and display all personal and corporate names, both transcribed forms and controlled vocabulary.

11) **Geographic Area:** While potentially useful, geographic area is arguably a less important attribute for expressions and manifestations than it is for musical works. For recordings, geographic area of the expression is often included in a note; however, this is a free-text field not designed for machine manipulation. This note (which may contain other information about the recording, particularly the date) should be indexed in general keyword indexes and displayed.

Other Aspects of Music Discovery

a) **Introduction:** Several issues related to music discovery do not focus on particular attributes or relationships.

b) **Authority Records:** For music materials, authority records are essential to back end functions like cataloging. In addition, they are also extremely important for public interfaces in that they provide valuable cross-references and other information to users. Creators—whether composers, lyricists, librettists, or even corporate bodies—are important access points for music. So too are associated contributors such as performers, arrangers, and editors. Because a single creator or contributor might be known by more than one name, a method should be provided to lead users from alternate names to the forms they seek.

c) **Compilations:** Multiple expressions are frequently issued together in a single manifestation, sometimes called an aggregate. This is particularly common for recordings, which often contain expressions of more than one musical work, each of which might be by a different composer, for a different medium, of a different genre, performed by different performers, or based on different works. It also occurs with notated music, e.g. song anthologies or collections of all or some works by a single composer. Under most past and current descriptive and encoding standards, the relationships in multi-expression manifestations (a) between works; and (b) between works/expressions and their performers, medium of performance, or format of notated music are often recorded in notes designed for human interpretation but are not linked together in a manner friendly to machine processing.

d) **Searching: Alphabetical and Keyword:** Historically, alphabetically filed "browse" listings have been indispensable in library information retrieval, beginning with the card catalog, and continuing in "traditional" OPACs. OPACs introduced the additional functionality of keyword searching. "Next-generation" catalogs added faceted browsing, but many simultaneously ceased to provide alphabetical browse searching. Author, title, and subject, are, alone, insufficient access points for music. This deficiency led to extensive development of uniform titles (especially generic uniform titles) and subject headings (which in reality reflected true "aboutness" only occasionally) to provide access to music materials based on attributes beyond author, title, and subject.

e) **Enhancements: Third-Party Content:** The ability to incorporate third-party content is an important enhancement to discovery systems. Existing data from vendors, publishers, and other content providers can be leveraged to increase the information available in and through a discovery system. Content from outside a bibliographic database can be either linked or incorporated. Links to external content have been included in traditional MARC bibliographic records for some time: URLs pointing to digitized versions of tangible resources, movie reviews, tables of contents, program notes, or finding aids. Incorporated content may come from any number of sources and can include cover art, reviews, summaries, previews of initial/selected pages, or other content.

f) **Music-Specific View:** Music materials possess many attributes that are unique or uniquely important. In addition, while in the bibliographic universe as a whole, the norm is for each work to be realized by only one expression realized by one manifestation, for musical works, multiple expressions and manifestations are the norm. Because of these factors, it is worth considering whether a discovery tool should have a music-specific

view that highlights these particular attributes and relationships, employing facets, limits, and displays that aid in the finding, identification, and selection of music materials.

4. Conclusions

"Discovery" has become a library buzzword but it refers to a traditional concept: enabling users to find information and materials. Discovery was first facilitated by print indexes and card catalogs, then later by online library catalogs and search engines. Today, the discovery environment is changing rapidly both within libraries and externally. Within the library realm, FRBR, RDA, discovery tools, and faceted browsing are key factors related to these changes in the way our users navigate searches and encounter library data. The newest discovery interfaces aim to remove barriers between different types of data and incorporate aspects of nonlibrary online searching environments familiar to users. When discovery interfaces work well, everyone benefits: the library's collections are more fully exposed, and the user does not have to adhere to nor struggle with the shortcomings of complicated search vocabularies and strategies. Discovery is optimized.

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