

A COMPARISON OF THE NEW RDA CARRIER AND CONTENT TYPOLOGIES WITH END-USER CATEGORISATIONS

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ABSTRACT

The projected *Resource Description and Access* (RDA) standard, set to replace the *Anglo-American Cataloguing Rules*, aims to facilitate a more user-centred library catalogue display by breaking down the current General Material Designations (GMDs) and Specific Material Designations (SMDs) into two semantically distinct facets, one representing a resource's *carrier*, the other its *content*. As well as offering search limiting by these two facets, RDA-based catalogues could sort by either facet, and group results by the carrier and content categories for users to explore. However, although the theory behind the carrier and content typologies may be convincing, the sets of terms proposed to represent the various categories of carrier and content were not constructed through analysis of end-user classifications, nor have they been tested on end-users. One way of investigating how users categorise things, commonly employed by information architects, is the *free-listing* technique, in which participants are asked to list all the items in a particular domain. This technique was applied in a simple online survey that aimed to examine the nature and scope of carrier and content categorisation by visitors to a university library catalogue. The results indicate that user typologies may extend a lot further than the RDA categories, involving several other major facets, such as purpose, audience and extent. In common usage, the concepts of content and carrier, along with other facets, are very often combined, and an optimal catalogue search interface should do likewise.

INTRODUCTION: THE GMD AND SMD

The General Material Designation (GMD) is a construct used in the *Anglo-American Cataloguing Rules* (AACR) to indicate a resource's basic 'type'; its use is mirrored in the International Standard Bibliographic Description (ISBD). AACR2 makes the GMD an optional element in the bibliographic record, but if it is included, then it must be recorded according to one of the two lists of terms set out in AACR2 1.1C1. In Australia, List 2 (see below) is invariably used; the GMD is not usually recorded for printed books and serials, but it is usually recorded for most other materials.

GMD List 2

activity card
art original
art reproduction
braille
cartographic material
chart

diorama
electronic resource
filmstrip
flash card
game
kit
manuscript
microform
microscope slide
model
motion picture
music
picture
realia
slide
sound recording
technical drawing
text
toy
transparency
videorecording

An important, and unfortunate, rule is that only *one* of the terms listed may be used for the GMD of any particular resource, as represented in a single bibliographic record (although multiple GMDs might be recorded in an analytical record when various separate components of a resource are described). Three qualifying terms may, when applicable, be added to the main term: large print, tactile and braille.

The GMD is complemented in AACR and ISBD by the Specific Material Designation (SMD). The 'extent' of all physical resources must be recorded, according to AACR, in the physical description area of the bibliographic record, and it is there that the SMD is assigned, which indicates more specifically the type of item(s) making up the resource. In this case, multiple SMDs may be employed for resources (such as kits) comprising various materials. Along with the SMD, the number of items, and other details, are often included in the 'extent of item' element. An exception whereby no SMD is recorded is textual material, where the number of pages or leaves is usually given instead – a detail that represents an aspect of what is really the SMD, i.e. the book (or volume, etc.).

Another difference between the GMD and SMD is that the latter is not derived from a closed list of terms, at least not for many classes of material. Thus the SMD of sound and videorecordings may be a term of common usage, and another term not on the list of graphic materials may be used if considered more appropriate.

REVISION OF THE GMD AND SMD

The limited nature of the list of GMDs, in particular, has led to calls for its revision and expansion, and, in some cases, unilateral action has been taken to provide library catalogue users with a clearer indication as to the nature of particular resources. For

example, Chung (2001) reports how public libraries have found their users inconvenienced by the generic nature of the existing GMDs, particularly for audiovisual material, and have either instituted a more specific local list, or added more specific terms in local fields that their OPACs have displayed prominently. Weihs' survey (2001) of users' and cataloguers' views on the GMD terms also pointed to a desire for more specificity. Such views are not new—the Library of Congress pointed out the GMDs' uneven treatment of materials when they were first introduced, in which some materials were allowed quite specific terms, such as 'filmstrip', whereas others were assigned more generic, and arguably artificial, terms, such as 'sound recording' and 'text' (Guerrini 2004).

However, a more fundamental criticism of the list developed out of the FRBR 'movement', which called for a more explicit bibliographic separation of intellectual content and physical carrier, as represented in the work-expression-manifestation-item hierarchy of the FRBR model (IFLA 1998). A practical impetus for a 'FRBRization' of the GMD list may have been the increasing difficulty involved in defining the terms as mutually exclusive, when in reality two or three of them could quite often, and quite helpfully, be applied to a particular resource. For instance, a microfilmed map is both microform and cartographic material, an MP3 file is both a sound recording and an electronic resource, and a website might consist of both pictures and text (amongst other things), as well as being an electronic resource. This issue of media convergence was also reported in Weihs' GMD survey (2001).

Some moves to disentangle content and carrier at the GMD level have focused on particular areas. For example, the previous GMDs of 'map' and 'globe' (carriers of a particular type of content) were replaced with 'cartographic material' (the type of content), and it was proposed (Welch *et al.* 2001) to qualify the term with appropriate carrier terms such as 'electronic resource' (though this has not materialised).

However, a more systematic disentanglement started with Delsey's 'The logical structure of the *Anglo-American Cataloguing Rules—Part I*' (1998), which analysed the AACR rules for description in the light of the FRBR model. He pointed out the hybrid nature of terms in List 2, variously representing physical format, class of material, form of carrier and notation; some pertained to expression level, some to manifestation level; some of the terms were also SMDs.

Yee (2007) has also demonstrated that the current GMDs are defined according to both content and carrier. She identifies the three GMDs for moving images (electronic resource, motion picture and videorecording), two of which (motion picture and videorecording) can only be used for moving image content; and she also shows that a change in carrier (e.g. from film reel to videocassette) without a change in content may result in a change across these three GMDs.

Tillett initiated a formal review of the GMD list(s) through her 2001 discussion paper outlining the origins of the GMD element for the Joint Steering Committee of AACR (now JSC-RDA). Tillett found that it had begun as a way for public libraries to mark out non-print materials that they were beginning to acquire, particularly in cases where titles for print and non-print materials coincided. The first GMDs formatted in square brackets were called 'medium designators' and appeared in the 1975 revision of AACR1. By the time of ISBD(G) (1977) and AACR2 (1978), the 'GMD' was in place,

and intended to provide an indication as to the ‘class of material’ at ‘an early point in the description’. However, the list has continued to expand through successive revisions of AACR2. Tillett (2001) referenced Delsey’s study (1998), that had exposed the list’s logical flaws, and suggested that a working group be established to reconstruct a list reflecting *mode of expression*, with those terms pertaining to carrier and format reassigned as SMDs (if they were not SMDs already). Tillett’s recommendations were supported by Huthwaite in her ‘class of materials’ paper (2002), and, broadly, by the First IFLA Meeting of Experts on an International Cataloguing Code (2003).

The deconstruction of the GMD carried out by GMD/SMD Working Group (2005), and ultimately by Delsey (2006), editor of *Resource Description and Access* (RDA), the standard set to replace AACR, could be said to reflect these recommendations, although it has been based on a content-carrier dichotomy rather than an expression-manifestation dichotomy. In fact, the dichotomy was transformed into a trichotomy of content, media and carrier; however, the latter two facets are in a direct hierarchical relationship, that is, the carrier terms are more specific media terms. This two-level approach to the carrier/manifestation aspect appears to be based on a perceived need for terms at the same level of generality as the content terms, which are indeed very broad. There would be less of an argument for a typology at the same ‘syntactic’ level, as any element defined by RDA, including an ‘extent of item’ element (containing the former SMD), can be displayed at any position or level, since format is not prescribed by RDA.

The RDA trichotomy is represented by three elements: content type, media type, and type of carrier. Content type is defined as ‘the fundamental form of communication in which the content is expressed and the human sense through which it is intended to be perceived’. Media type is defined as ‘the general type of intermediation device required to view, play, run, etc., the content of a resource’. Carrier type is defined as ‘the format of the storage medium and housing of carrier in combination with the type of intermediation device required to view, play, run, etc., the content of a resource’.

All three elements are controlled, that is, they are defined by controlled vocabularies set out in RDA. These vocabularies could be mapped to corresponding vocabularies in other languages, for the purposes of display, or to codes for the purposes of automated retrieval or iconic output, but they are essentially predefined and do not accommodate local expansion or revision.

The three vocabularies were constructed with a view to their compatibility with the relevant attributes set out in the ‘RDA/ONIX Framework for Resource Categorization’ (Delsey *et al.* 2006). These attributes are: character, sensory mode, image dimensionality, image movement, intermediation tool, storage medium format, and housing format. Some extensions (i.e. sub-values) of the RDA/ONIX categorisations were proposed in order to accommodate some of the more specific types of carrier. Similarly, the RDA vocabularies derived from the GMD and SMD lists were expanded to cover categories found in the RDA/ONIX Framework. Nevertheless, the carrier typology, in particular, quite closely resembles the existing AACR vocabulary.

A further level of carrier specificity was in fact recommended by the GMD/SMD Working Group, but was rejected on the grounds that its values related to other RDA elements such as production method and digital characteristics. Definitions of the terms used in the vocabularies are provided in the RDA drafts. Choice of terminology was

based primarily on ‘common usage’. The vocabularies are intended to be extensible, that is, hospitable to additional terms as new types of resources are developed.

VALIDITY OF THE RDA APPROACH

Recently, however, the bibliographic move to distinguish content and carrier has been called into question by Green and Fallgren (2007). They argue that in real life the two facets cannot be readily separated: ‘while there is pure intellectual content (thought) and pure physical carrier (e.g. the container that houses an information package), most of what we deal with in the bibliographic world lies in an intermediate arena where content and carrier aspects both apply’. In other words, the two aspects are not orthogonal in common language and use. Green and Fallgren (2007) re-examine various manifestations in order to construct a faceted classification of ‘material types’. In their scheme, there are seven facets, each comprising several sub-facets: content, generation of content, physical characteristics, publication/distribution, perception/use, and relationships. These facets cut across ‘carrieriness’, so that even content contributes to the definition of some ‘carriers’ (e.g. newspapers). The aspects covered by the new RDA lists are nevertheless represented by some of the sub-facets, particularly in the facets of perception/use and physical characteristics. Green and Fallgren have thus expanded on, more than rejected, the two RDA dimensions.

Whether users are reading a record display, or sorting records, or limiting their search, the metadata needs to be intelligible and helpful, as Green and Fallgren (2007) point out. Leaving aside the choice of the terms used in RDA to represent the carriers, media, and content, which could be changed for more appropriate ones in particular user contexts, the question remains as to whether the typologies proposed in the RDA drafts are actually the most helpful, i.e. the most useful. Not all theorists are in agreement; moreover, the end-users appear not to have been consulted. The remainder of this paper reports some research that attempts to map out catalogue users’ conceptualisation of library resource types, testing the content-carrier categorisation proposed in RDA.

RESEARCH DESIGN

The format independence of RDA elements, including content, media and carrier types, is designed to facilitate, amongst other things, greater scope for faceted navigation on OPAC interfaces. Faceted navigation systems are increasingly recognised by designers of search interfaces, including OPAC interfaces, as important features for exploratory information seeking, a hitherto neglected form of information retrieval behaviour. The design of such systems is the province of information architects, and so it was to this field that the author turned for a research method that would enable the exploration of a user group’s conceptualisation and knowledge of a particular domain—in this case, the user group was those users of a particular catalogue, and the domain was library resources.

Sinha and Boutelle (2004) describe how information architects can implement a three-stage process to construct user-centred taxonomies: the techniques involved are free-listing, open card-sorting, and closed card-sorting. Open card-sorting is a survey in which users are asked to sort terms or objects into groups (i.e. categories), which they

may also be asked to name; information architects commonly use this technique to structure websites and design their menus. Closed card-sorting is a way of checking the reliability of an open card-sort, in which users are asked to sort terms or objects into predefined categories. Before information architects start grouping terms or concepts with the aid of card-sorting, however, they need to establish what those terms should be, or rather, how a given domain should be divided up into particular classes represented by particular terms. This is where the free-listing technique is sometimes used, as it asks users to first list all the ‘things’ (items) in a particular domain.

Free-listing is a relatively simple technique, but one that can be used to investigate the boundaries and content of a knowledge domain for a particular user group, the structure of that domain and those items in the domain that are more *salient*, the terminology used by group, and the extent to which boundaries and structures coincide amongst individual users (Ryan *et al.* 2000). The technique has been borrowed from cognitive psychology and anthropology, where it is well established, and has been used to explore a wide range of knowledge domains, such as plants, medicines, colours, kinship, and so on (Robbins & Nolan 1997). Respondents may be asked to list verbally, or in writing.

The objectives of this research meant that inter-user comparisons were of less interest. Although a library catalogue could be made to display different elements from taxonomies for different sub-groups, demographic questions were not included in the free-listing survey; the analysis focused on the domain rather than individual users. The salience of a listed item – which represented a category of material in this survey – can be measured in two ways: in terms of the frequency of its listing, and in terms of its position in the lists. Items listed nearer the beginning of a list are assumed to have a higher salience. However, in this free-listing exercise, it was decided to give examples for clarification, which would very likely influence order, and so the second measure of salience was not employed. The proximity of items in lists may also be an indication of their ontological proximity; cluster analysis based on this assumption has been used to reveal ontological structures. Again, the examples included in the survey questions compromised such an analysis, and it was not conducted.

Free-listing questions may at first seem straightforward to respondents, but the open-endedness of the task can lead to frustration, and tests the limits of respondents’ memories. Often, respondents fail to list every item they actually ‘know’, and it is therefore important for the sample size to be large enough to cover these omissions. Cues are sometimes used to elicit more items (Brewer 2002), but they would have been very difficult to create in the online survey employed in this research. Non-specific prompting and reading back lists to respondents have also been shown to elicit additional items (Brewer 2002), although their benefits may well be greater in the oral context, and they were not used in this survey.

Written free-listing is recommended in literate contexts by Quinlan (2005). Users of most online library catalogues are not only literate, but also attached to a keyboard, and so it was deemed appropriate to conduct the free-listing exercise in the form of an online questionnaire. As the concept of bibliographic item, or library resource, is relatively obscure in the wider world, the online survey was positioned specifically in the catalogue context—an invitation to access and participate in the survey was inserted into the library catalogue homepage.

The object of this research was not to compile a comprehensive ontology for library resources across all user groups and cultures. Rather, it was to gain insights into the way the domain is constructed amongst one particular user group. If the domain coincides with the RDA lists, or at least represents a subset of them, then further investigations might be undertaken amongst other groups. On the other hand, if the domain is found to diverge from the lists, then a re-examination of the lists might be in order, especially as the user group chosen for the study is by no means extraordinary.

It was decided to test the content-carrier dichotomy directly, by presupposing the two sub-domains and asking users for two free-lists: a list of all known content types and a list of all known carrier types. Given the direct relationship between the media and carrier typologies in RDA, it was decided not to complicate matters by asking for a third list. It was not expected that all items on the corresponding RDA lists would be covered (this is after all just one particular user group); of more interest than omissions, would be any items outside of the RDA lists, particularly those not directly subordinate or superordinate to RDA items.

Visitors to the homepage of the Charles Sturt University library catalogue were invited to link to an online questionnaire for two weeks in April-May 2008. The anonymous questionnaire consisted of six questions, including the two free-listing questions. The other questions asked about catalogue use, and in particular use of the limit and sort options. Theoretically, the same user could respond to the questionnaire more than once, but the responses did not indicate any such behaviour. The two free-listing questions are given below:-

4. Please list below ALL the information resource FORMATS that you can think of, such as 'video cassette' or 'print'. Don't list types of content, such as 'moving image' or 'picture'.
5. Please list below ALL the basic types of CONTENT in information resources that you can think of, i.e., the fundamental forms of content, such as 'moving image' or 'picture'.

The question was phrased in terms of knowledge rather than use, as the largest possible set of items was desired. Whether some were used very little (either directly or bibliographically) was not of such great concern, and in any case those most often listed are likely to be the most salient, and salience would likely be quite closely associated with use. The distinction between 'format' and 'content' was made at the outset; the word 'format' was used instead of 'carrier' as the latter was considered to be less intelligible to the average user. Instead of clarifying the 'format' and 'content' terms using the rather verbose RDA definitions, it was decided (after piloting) to use examples (not necessarily RDA examples), and to change these examples half-way through the survey period to other examples (which were CD-ROM and book; music and text). The items used as examples could thus also be analysed by examining those lists in which they were not used as examples (but may have nevertheless been included).

RESULTS

Seventy respondents attempted to list both content and carrier types. This was considered a fair sample size, and is larger than many free-listing samples (Sinha, 2003).

It is true that the domain was of a relatively general and abstract nature, but the same items were being listed by the end of the survey period (as well as some different ones), and a Zipfian-like distribution had emerged (with a few items often listed and many items seldom listed).

For each type, all the terms in the respondents' lists were examined for synonymy—which was defined strictly, as terms between which the researcher could not interpret any possible difference in meaning (the singular and plural form of a term was a more obvious example of this, though even here there were occasional exceptions, e.g. print and prints). The terms were thus normalised, and two lists compiled for content and carrier types, which occurred with the frequencies shown in tables 1 and 2. The long tails indicate that there is much scope in this domain (or the two sub-domains) for individualistic approaches; in other words, it indicates a lack of consensus as to the ontology of library resources.

Tab.1: Free-listed content types

Type	f
picture/image/still image/graphic	41
sound/audio (recording)	29
text	16
movie/film/moving image	13
video	12
photo	10
graph	9
print	9
table	9
diagram	8
map	8
visual	5
audio words (spoken)/speech	4
digital	4
program/software	4
article	3
chart	3
game	3
lecture	3
multimedia	3
music	3
voice (recording)	3

words	3
animation	2
art	2
audiovisual	2
book	2
chapter	2
data	2
DVD	2
factual	2
interactive learning	2

journal	2
model	2
object	2
(sound)track	2
statistics	2
television program	2
tutorial	2
written text	2
ad(vertisement)	1
atlas	1
audio book	1

audio music	1
commentary	1
computer file	1
death notice/funeral	1
dialogue	1
digital image	1
directory	1
documentary	1
drawing	1
e-book	1
english	1
entertainment	1
e-resource	1
fiction	1
file	1
forum	1
geography	1
gif	1
headline	1
html	1
hyperlink	1
illustration	1

information	1
law	1
literature	1
mathematics	1
non-fiction	1
novel	1
pamphlet	1
picture book	1
plan	1
podcast	1
printed words/text	1
prints	1
sketch	1
social class	1
sound byte	1
survey	1
text on paper	1
textbook	1
toy	1
visually impaired (resource)	1
web	1

Tab.2: Free-listed carrier types

Type	f
DVD	51
journal	47
video (recording)	33
book	24
CD ROM	24
CD	20
newspaper	20
e-book	14
electronic/digital (resource)	14
audiocassette	12
magazine	12
map	10

cassette	9
sound recording/audio	9
microfiche	8
journal - electronic	7
database	6
article	5
kit	5
MP3	5
website	5
microfilm	4

pdf	4
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periodical	4
picture	4
podcast	4
audio CD	3
catalogue	3
computer software	3
html	3
internet (resource)	3
journal article	3
pamphlet	3
photograph	3
poster	3
talking/audio book	3
web page	3
audiovisual (resource)	2
encyclopaedia	2
film	2
game	2
library reserve (resource)	2
reference item	2
thesis	2
video cassette	2
Web (resource)	2
archival material	1
archived file	1
blog	1
brochure	1
chart	1
conference proceedings	1
data tape	1
dictionary	1
digital copy	1
disk	1
distance education (resource)	1
educational aid	1
educational game	1
electronic audio	1
electronic journal article	1
electronic text	1

flash drive	1
floppy disk	1
gif	1
government research report	1
hard drive	1
image	1
index	1
intranet (resource)	1
ipod	1
journal - online	1
journal - paper	1
jpeg	1
large print book	1
law journal	1
manuscript	1
map sheet	1
media (resource)	1
model	1
mpeg	1
mps	1
music cassette	1
music CD	1
music manuscript	1
music score	1
newspaper article	1
non-scholarly (resource)	1
online textbook	1
paperback	1
peer-reviewed journal article	1
PhD (thesis)	1
portfolio	1
powerpoint	1
quarto	1
radio program	1
scholarly (resource)	1
slide	1
text	1
textbook	1
UN research report	1

USB thumbdrive	1
verbal cassette (spoken word)	1
VHS	1
wiki	1
xml	1

zip	1
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Content types

Comparing the content free-lists with the RDA content typology, we see that many (17/23) of the RDA types are not present at all in the free-lists; this is not wholly surprising, given the intended universality of RDA. More interesting was the proportion of free-listed items not present in the RDA list. Seventy-nine of the 85 (93%) free-listed items in table 1 are not covered by the RDA content types. Of the 40 free-listed items mentioned by more than one respondent (those with a frequency of two or more), 34 (85%) are not in the RDA list. The five items that did coincide were relatively salient, in terms of listing frequency, but not altogether the most salient, ranking first, third, fourth, joint thirteenth, joint thirteenth, joint sixteenth and joint twenty-fourth.

When the non-RDA items are examined, we see a large number that are not really related to ‘content’ according to the RDA definition, but represent other aspects of the message, including purpose of communication (e.g. entertainment, information), subject (e.g. geography, law), audience (e.g. visually impaired), and perhaps most notably, carrier (e.g. book, digital, print). There was also program or software, which is included in the RDA typology, but would appear to be more of a communication tool, than a description of content. Excluding those items that were only free-listed once, the proportion of free-listed items that would seem to have no ‘content’ aspect (in RDA terms) is 9/40, i.e. 23%. Six items (15%) are essentially superordinate to the RDA types; six others match RDA types, leaving 19/40 items (48%) which involve aspects of RDA’s ‘content’, but which also involve other aspects, such as the purpose of communication (e.g. diagram, lecture), the extent (e.g. article, chapter), the process of realisation (e.g. video, photo), and the carrier (e.g. DVD). The three groups of non-RDA items are listed below (lists 1-3). Of the six items listed ten times or more, all related to ‘content’ in RDA terms, but one (sound/audio) was superordinate, and two (video and photo) represented additional aspects.

List 1. Non-content items

print
digital
program/software
game
art
data
factual
interactive learning
tutorial

List 2. Superordinate items

sound/audio (recording)
 visual
 multimedia
 voice (recording)
 words
 audiovisual

List 3 – Items with other aspects

video
 photo
 graph
 table
 diagram
 map
 article
 chart
 lecture
 animation
 book
 chapter
 DVD
 journal
 model
 (sound)track
 statistics
 television program
 written text

Given that the respondents were asked specifically to list ‘content’ types, the abundance of shared items that were either outside of the RDA definition, or were either superordinate or indirectly subordinate to the RDA types, indicates that the RDA content typology is not particularly salient for this user group, and that the users conceptualise library resources across more dimensions, or facets. There are, in fact, several facets which appear to be at least as salient to the library catalogue users as those involved in the RDA definition of content. Leaving aside subject (which would be covered by subject headings) and carrier (covered by the carrier typology in RDA), purpose and extent were also commonly identified. Moreover, in many cases, it was the *combination* of these facets that produced many of the types listed by the users, a critical point for those developing catalogue interfaces.

The users also made the distinctions found in the RDA/ONIX Framework, such as the distinction between words, music and images (character); hence some of the superordinate items. It should be noted that words and music, even when they are presented visually, are processed by the ‘internal ear’. The interplay of the visual and auditory in communication is pervasive and complex; a typology of communication content that differentiates, primarily, between the senses does not go far enough.

The lack of a clear content-carrier division in user ontologies is also highlighted by the observation that of the seven RDA types listed in the content sub-domain, three were also listed in the carrier sub-domain.

Carrier types

Comparing the carrier free-lists with the RDA carrier typology, we see that the vast majority of the RDA types (39/43) are not present at all in the free-lists. Although we might not expect to see a majority of the types, the fact that there are only four is cause for concern, given that there were 107 items listed altogether. Of the 46 items free-listed more than once, only three (7%) coincide with the RDA list. It is thus fair to state that the user-based and RDA typologies for carrier/format barely coincide. It is not even the case that the three multi-listed items that do are the most salient amongst the users: they are ranked, by frequency of listing, tenth, fifteenth and joint thirty-eighth.

Only one item listed by more than one respondent – game – appears to be independent of carrier. However, as with the listings of content types, many of the carriers listed involve aspects other than the components of the RDA carrier definition, and some much more so. Many are limited to particular RDA carriers, but cut across them according to their character aspect, for instance (e.g. textual types). Many involve purpose and/or extent aspects. Of the 46 multi-listed items, there were 33 (71.7%) with non-carrier aspects as well as carrier aspects. They are shown in list 6.

Other aspects that were identified included process (e.g. photograph), audience (e.g. distance education [resource]), source (e.g. radio program), emanation (e.g. UN research report), and size (e.g. quarto). The RDA meaning of carrier was also extended to an institutional level (e.g. archival material).

Although there are three items that match RDA types, there are also five superordinate items (some of which, but not all, equate to RDA media types) and four directly subordinate items (see lists 4-5), suggesting that the RDA typological level does not consistently coincide with the level at which the users were primarily thinking (at least not these users). The most frequently listed item, DVD, for example, is categorised as videodisc by RDA.

Of the eleven items listed ten times or more, two were deemed superordinate and two subordinate to the RDA types, while another seven represented other aspects in addition to carrier.

List 4. Superordinate items

video (recording)
 electronic/digital (resource)
 cassette
 microfilm
 library reserve (resource)

List 5. Subordinate items

DVD
 CD
 internet (resource)
 Web (resource)

List 6. Items with other aspects

journal
book
CD ROM
newspaper
e-book
magazine
map
sound recording/audio
journal - electronic
database
article
kit
MP3
website
pdf
periodical
picture
podcast
audio CD
catalogue
computer software
html
journal article
pamphlet
photograph
poster
talking/audio book
web page
audiovisual (resource)
encyclopaedia
film
reference item
thesis

The users' notion of format clearly extends a long way beyond the carrier definition and typology of RDA. Many, indeed a majority, of the more salient items in both sub-domains involve one or more other facets, and many of the items listed involve both the RDA-defined carrier and content facets.

CONCLUSIONS

The evidence from this research indicates that Green and Fallgren (2007) correctly argue that the two elements of content and carrier 'bleed into' one another in everyday bibliographic usage. Further, they rightly point to a number of other facets and sub-facets that are involved in the ontology of library resources, at least amongst university OPAC users, and that need to be incorporated as metadata, if the search interface is to be optimal from usability and functionality perspectives.

Just one of the lists, whether content or carrier list, would fall a long way short of optimal, and even both lists, in combination, would fall considerably short. The combination of additional facets, such as purpose and audience, would greatly enhance OPAC searching. Given their preponderance in this user groups' ontology, they may in

fact be as critical and as ‘required’ as the content and carrier facets. While it is true that some of these other facets are covered in the rules in the draft chapters 3 and 4 of RDA, (as indeed they are covered, to some extent, in the current AACR2 rules for description), these rules do not involve the use of specific controlled vocabularies (i.e. taxonomies) to express these facets, which is critical if the information is to be used in faceted navigation. The evidence suggests that content and carrier description is by no means the only kind of description that would benefit from emphasis and standardisation.

This research could be usefully followed up by a card-sorting exercise using the free-listed terms (particularly those that were listed more frequently). Given the results, it may well be appropriate to merge the two sets of ‘content’ and ‘carrier’ terms, and let the users re-categorise them in an open card-sort. Other facets, apart from those identified by the researcher, may emerge. Both free-listing and card-sorting exercises are relatively easy to conduct, and could be applied to many other catalogue user groups. The techniques inform at both universal and particularistic levels. While this paper has focused on the proposed RDA typologies, free-lists also provide a good indication as to which elements of a universal typology are the most important for a particular user group, and whether additional sub-facets should be implemented locally. In addition, they indicate the more user-oriented terminology. Card-sorts, on the other hand, provide good evidence for the optimal (i.e. the most user-centred) categorisations, and sub-categorisations, given a particular set of items. They can also provide evidence for optimal taxonomic order (not necessarily alphabetical order, of course), which may be of particular importance in the case of different levels of display (basic and advanced searches, brief and full records, etc.).

The General Material Designations originated from a practical need to identify particular library resources as new media types became established. The convergence of these media types in recent years has in fact exacerbated this need, as resources take on multiple values in multiple facets. The new RDA scheme, by explicitly recognising both content and carrier dimensions, and allowing multiple types, goes some way to modernising the existing List 2 of AACR, but could go further.

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