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Classification is the theme of this bumper issue of Catalogue and Index.
There was a tremendous response to the call for papers, illustrating the
importance and interest in classification to the U.K. cataloguing and
metadata community. The classification discussed in this issue comes in
many flavours, including the usage of classification schemes, digital tools
for classification, the theory of classification, reclassification, and much
more besides.

The issue starts by exploring the usage of classification schemes.
Deborah Lee and Anastasia Kerameos outline the results of a survey
into U.K. classification practices, linked to the recent CILIP CIG
workshop "Thinking about classification". John Ackeroyd and Aida Slavic
discuss how UDC is used, including survey results relating to the U.K.
and the use of UDC in repositories and as part of catalogue records.
Vanda Broughton discusses classification theory and how classification
(and classification schemes) are still a critical part of organizing
information.

Reclassification is another significant part of cataloguing and
classification life, and this issue is a rich source of information about
various reclassification projects. Sean Goddard and Tim Haillay
describe a reclassification project at the University of Sussex, specifically
focussed on language and literature. Jane Del-Pizzo discusses a project
to standardise classification at the University of Law, where the Thema
classification scheme was adopted. Nicky Ransom outlines a workflow
for reclassification that has been tried and tested at the University for the
Creative Arts. Martin Kelleher discusses a particular issue involving
LCC, literary authors and Cutter numbers, and describes how the
University of Liverpool have carried out reclassification projects to
resolve some of the arising issues.

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Some articles focus on specific classification schemes, and in particular the relationship between classification schemes and library users. Penny Doulgeris shares her experiences of using UDC at the International Atomic Energy Agency (IAEA) and considers the advantages and disadvantages of using UDC, in particular how UDC serves the community of users. Mary Mitchell talks about her experiences devising a completely new classification scheme specifically written for a private library, and describes how she sometimes needed some unconventional thinking to create a systematic scheme which also met the client's needs. David Harwood and Alison Hazelaar discuss their in-house classification scheme, the Garside classification, at the University of Leeds, including its history, revisions and the challenges and opportunities offered by using a local classification scheme.

The huge role that technology has to play in classification is also explored. Marcin Trzmielewski and colleagues from the University of Pavia introduce a new tool, "SciGator", which provides mapping between DDC, local usage of DDC and other classification schemes, illustrating the potential of mapping tools to bring together data residing in different knowledge organization systems. Edmund Wilkinson discusses augmented reality (AR) in libraries, and how augmented reality can bring together the library catalogue with the classification of objects, and the physical resources with the electronic resources. Stella Dextre Clarke introduces the ISKO Encyclopedia of Knowledge Organization (IEKO), an open access, peer-reviewed, online encyclopedia for key concepts, issues, and more, in knowledge organization, showing how technology can also help to further classification thinking and research.

Finally, Stephanie Moran and Eve Lacey provide share their thoughts about the recent CIG events, "RDA in a day" and "Thinking about classification".

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Classification in the U.K.: introducing the 2017 CILIP CIG classification survey

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Introduction

Classification is a critical part of cataloguing and indexing activities; yet, amid the major changes in the bibliographic world in the 2010s, it could be argued that discussing classification has not been the first priority of practitioners in recent years. An event in June 2017 organised by CILIP CIG, entitled "*Thinking about classification*" and devised by the authors of this article, hoped to counteract this. A survey was designed by the authors of this article in conjunction with this event, which explored the classification practices within U.K. libraries. This article offers some preliminary results from this survey, illuminating the real world of U.K. classification practices in 2017. The survey served a number of purposes. First, it was felt that recent information about what was being classified and usage of classification schemes was lacking, and it would be useful to get broad data which would partially answer these fundamental questions. Second, one session in the classification event focussed on reclassification, and so results from the survey could be used as a starting point for exploring reclassification practices. Third, certain concepts such as reclassification and adaptation are not widely written about on a conceptual level, so the survey could help provide some raw data which would inform future theoretical research into these areas.

This article starts by describing the methodology of the survey, including its dissemination. This is followed by a description of the demographic results. The main part of the article explores two areas: whether specific types of materials are usually classified, and, how schemes are used (or "consumed") within the U.K. So, a picture is built up of contemporary U.K. classification practices.

Methodology of survey

Using the free version of SurveyMonkey imposed certain limits, such as a maximum of ten questions and a limit of one hundred respondents, and these limitations were built into the design and dissemination of the survey. The survey questions fell into four main areas:

- demographics of the respondents;
- basic information about classification schemes and materials classified;
- detailed information about localisation and adaptation; and
- reclassification practices.

The first two areas will be discussed in this article, with the other two explored in future research. The first four questions are given in the appendix to this article. All results given are to two decimal places, as this matches the results given in SurveyMonkey. A survey was selected over other methods in order to gain as wide a variety of responses as possible and to elicit information that could only be provided by the institutions themselves. (For an alternative methodology, see for example, Broughton's (2017) survey of 50 U.K. higher education institutions, where the researcher determined each university's classification scheme by looking at catalogue records.)

The survey ran for a month, from May to June 2017. The geographic target was the U.K. as, not only is this area relatively unexplored in terms of international classification research, but also this limitation ensured the complications of a comparative study were avoided. The survey's distribution was specifically designed to engender U.K. responses from as wide a group of institutions as possible.

First, the survey was publicised through CIG directly, including its monthly e-bulletin which is sent to all CIG members, and CIG's social mobile channels such as Twitter. Second, mailing lists were used such as Jiscmail's UK-BIBS (for UK bibliographic services), ARLIS-UK (to target UK art libraries) and IAML-UK-IRL (to target UK music libraries). International cataloguing mailing lists were deliberately not used to disseminate the survey as only U.K. responses were desired.

Demographic results

The survey received 81 responses. The first two questions of the survey – sector and institution respectively – were used to determine the demographics of the respondents, without hindering their anonymity, and also to attempt to eliminate those responses outside of the scope of the study. Question 2 asked the respondent to name their institution/library, and 78 out of 81 responses were received. One respondent was eliminated as they were positively identified as being from outside the U.K., the others were retained as their reason for not answering this question was unclear.

The responses about sector show that some sectors are represented more than others; in fact just under half of the respondents (48.75%) worked in higher education/adult education institutions. The remaining respondents covered a wide variety of sectors, including four or more respondents from School/further education, National library/research library, Health, Industrial/Commercial/Legal, and Not for profit/Charity. This not only affects how we interpret the results but also raises questions about our methodology. Would we have solicited a wider response from other sectors by advertising the survey via other forums?

What types of resources do we classify?

The survey gives a fascinating insight into which types of library materials are usually classified and which are left unclassified. As well as ascertaining the specific classification scheme used for different types of materials, question 4 also established whether a particular type of material was classified at all. Table 1 summarises the parts of the results of question 4 pertaining to classified versus unclassified materials. Multiple answers were allowed for this question; for instance, if a library has its law books classified using DDC but its music books are not classified, then they would give two responses, "not classified" and "DDC". This means that the total responses for classification schemes used for one type of material will usually be bigger than the overall number of survey respondents. In addition, the figures have been adjusted to take into account the number of libraries which do not hold that type of material at all. To aid analysis the figure of libraries holding material but not classifying it is also given as a percentage.

[See table 1 on following page]

Comparing the figures for different types of materials can infer attitudes towards classification in U.K. libraries and illuminate the perceived worth and value of classification by practitioners. Unsurprisingly, printed books are the most commonly classified material with over 99% of book collections being classified. However, while less than 1% of printed book collections are unclassified, 63.38% of e-book collections are unclassified. As the content type of a book and e-book is the same, this suggests that decisions about classification are taken based on the printed/digital nature of their medium.

Type of library material	Total responses from those who hold this material type	No. of libraries who don't classify this type of material	Percentage of those holding the material who don't classify it
Books	110	1	0.09%
E-books	71	45	63.38%
Print journals	80	40	50.00%
E-journals	70	57	81.43%
Maps	50	8	16.00%
Music scores/ notated music	43	1	2.33%
Sound recordings/ audio materials	58	7	12.07%
DVDs/audio-visual materials	74	9	12.16%
Digital resources not covered elsewhere	58	34	58.62%
Microfilm/microfiche	49	14	28.57%
Store/stack materials	79	4	5.06%
Special collections materials	81	5	6.17%
Objects/Realia	41	14	34.15%

Table 1. Is this type of material usually classified?

This is confirmed by the difference between print journals and e-journals, which sees 50.00% and 81.43% respectively left unclassified; furthermore, "digital resources not covered elsewhere" are unclassified in nearly 60% of libraries. However, this pattern of being unclassified does not apply to all non-print media, as audio-visual materials, sound recordings and microfiche/microfilms are only unclassified in a third of collections or less. It would be interesting to explore further the reasons behind this. Are digital collections less likely to be classified largely because of their format or do other reasons, such as their acquisition through large packages and subscriptions, rule out hand-classification? Where classification is part of a downloaded record's standard metadata what effect would it have on discoverability? At present however, the results of this survey do suggest that being digital is a likely way for a resource to end up unclassified in a U.K. library.

As browsing is a central tenet for classification, another perspective in which to consider these results is the connection between classification and physical browsing. So, it is interesting that around 95% of stack and storage materials are classified; these materials will not be browsed by library users, yet the materials are still classified. While it is likely that the reason this figure is so high is that many of the materials currently in storage were formerly on the shelves and therefore came to the stacks with their classification already determined, the classification of stack/storage materials is still part of the classification fabric of current U.K. libraries. It can also be inferred that other closed access materials, such as audio-visual, sound recordings and microfiche, were always kept in closed access; again, if there was an unbreakable link between physical browsing and classification, we would expect much higher numbers for not classifying these types of materials. So, it seems in the 2017 U.K. library, the physical/digital divide will impact upon whether a resource is classified; however, the results of the survey suggest that being closed or open access makes much less of a difference.

Classification scheme consumption in the U.K.: a snapshot in 2017

The third question, asking simply which classification scheme libraries use, reveals current U.K. classification practices. The results also reflect on the nature of those individual schemes, illuminating the "consumption" (Lee 2015) of each classification scheme, which is part of their reception. Table 2 gives the number of libraries which use each scheme, and the equivalent percentage of the 80 libraries surveyed. For example, 5 libraries responded that they use "Universal Decimal Classification", so the number of responses is "5" and the percentage is "6.25%". This means that 6.25% of the U.K. libraries which responded use UDC in at least part of their library; furthermore, as each library is giving a separate binary response about whether they use each particular scheme, we also can surmise that 93.75% do not use UDC at all.

Classification scheme	Number of responses	Percentage of 80 libraries using that scheme
Dewey Decimal Classification (DDC)	43	53.75%
Library of Congress Classification (LCC)	14	17.50%
Universal Decimal Classification (UDC)	5	6.25%
Bliss Classification	2	2.50%
National Library of Medicine Classification (NLM)	7	8.75%
Moys Classification	7	8.75%
BISAC	0	0.00%
ANSCR	0	0.00%
Adapted scheme from any of the above	11	13.75%
Library's own classification scheme	30	37.50%
Other	8	10.00%

Table 2. Usage of classification schemes in U.K. libraries

The first interesting finding is that over half the libraries used Dewey Decimal Classification (DDC) in their library, and this is the biggest use of any single scheme. This represents the largest single answer. (Note, that the "adapted" answer could also include those who adapted from DDC, and the "other" includes at least one response of an adaptation from DDC, so actually DDC influence is possibly even higher.) The number of libraries using DDC was about three times the number of responses for Library of Congress Classification (LCC), which was the next most popular answer. Of course the sample size is small and cannot be taken as numerically representative. However, as a snapshot it offers an interesting alternative to the common narrative in the U.K. that academic libraries are moving towards LCC and that public libraries are moving away from DDC. This survey suggests that DDC is alive and well in the 2010s in the U.K. A future line of enquiry would be to mine the survey results in order to compare the scheme usage with the sector.

Another fascinating insight offered by these results is the high numbers of respondents for "*adapted scheme from any of the above*" and "*Library's own classification scheme*". Note that the difference between the two categories was self-determined by the respondents, so it is not reliable to compare across the (fuzzy) adapted/ own scheme boundary.   Further questions in the survey, not discussed in this article, attempt to delineate the levels of adaptations, and future research will consider adaptations and localisations in detail. Nevertheless, the two figures show something noteworthy: that over a third of libraries use a localised scheme of some description for at least part of their collections, and nearly a sixth use an adapted scheme. These figures are vitally important for discussions about universality and localisation. If localisation happens in at least a third of libraries, then conversely, using purely universal schemes *only* happens in two thirds of libraries. In a cataloguing world which is supposedly moving towards universal practices necessitated by global record sharing and shelf-ready, the results from this survey paints a different sort of picture.

The results about Moys and NLM are also noteworthy, as seven libraries use Moys and seven use NLM. These are both universal schemes (in other words, intended for use by multiple libraries) for the special subjects of law and medicine respectively. This could be regarded in a number of ways; as a sign of the quality of these particular schemes, of the standardised practices of the law and medicine communities, and/or the need for special classifications for these particular areas of knowledge. Note that in contrast, a scheme for sound recordings, ANSCR, received no responses in both question 3 and 4, even though 55 libraries hold sound recordings according to the results of question 4.

Returning to question 4, as well as viewing how many times any individual scheme is used for each type of material, analysis was also carried out by comparing the mean usage for each scheme with the results for individual types of material using that scheme. One of the most striking trends was the popularity of libraries' own schemes and adapted schemes for certain types of material. Print journals and other digital resources were especially likely to use a library's own classification scheme, and other digital resources were especially likely to use an adapted scheme. In addition, e-journals were also very likely to use an adapted scheme; however, the small number of libraries who classified their e-journals at all make these results unreliable from a statistical perspective. This could be read as non-printed-books being more likely to use specially devised schemes; however, a relatively high percentage of libraries classified their maps, sound records and music scores using a standard scheme such as DDC – in each case, more than the mean for overall DDC usage. So, being "non-book" does not in itself prescribe a non-standard classification path. The music results are particularly noteworthy when considering music classification literature reports that librarians have traditionally found DDC problematic for music materials (Lee 2012). Therefore, this survey points to useful future research which might question assumptions about classification scheme usage, against actually auditing how schemes are used in the contemporary, real world.

Conclusion

The results from the first part of the CILIP CIG survey present a snapshot of U.K. classification practices. The U.K. library community seems more likely to use DDC than other universal classification schemes; however, in this small un-systematic sample, LCC, Moys and NLM also received a fair amount of use. Perhaps most interestingly, the results of questions 3 and 4 showed that there is very frequent usage of adapted and localised schemes. So, it could be inferred that universality is not of primary concern in many U.K. libraries. The results also show that different types of materials are classified in very different ways in the U.K. community. While being in a non-browsable collection does not have too much impact on whether a material is classified or not, it seems that in the U.K. community, there is much less classification of electronic resources than physical resources. Furthermore, adapted and localised schemes were more likely to be used for materials such as other digital resources and print journals, while traditionally "difficult" resources such as sound recordings, maps and music, were actually fairly likely to be accommodated in standard universal schemes. This shows the power of the consumption-based approach in challenging "collective wisdom" with analysis of actual usage.

This article lays the groundwork for the next stage of the analysis, which is to consider the question of adaptation and localisation in more detail. In addition, the results from the reclassification questions will also be explored. Furthermore, there are other potential findings from the responses analysed in this article which there was no space to explore, such as a comparison of scheme usage with responses about sector of information work. Therefore, this survey and article acts as a beginning: it provides a snapshot of 2017 U.K. classification practices, but also illustrates the richness of further study of our classification lives.

Appendix: the survey questions 1-4
Introduction

The Cataloguing and Indexing Group (CIG) Committee would like to invite all cataloguers, CIG members and non-members alike, to take part in a short survey about classification and reclassification. We are interesting in hearing from people working in libraries and other information environments in the UK. The survey will take no more than 10 minutes to complete and your contributions will help inform discussions at the 'Thinking about classification' workshop in June and possibly inform future research about classification or reclassification by CIG committee members. Please note, that although we ask for institution names, we will not use individual institution names when disseminating the results from this survey.
Participation in this survey is voluntary, and you are free to leave the survey at any point.
Thank you so much for your time and your contribution.

Question 1.

Which sector best describes your current library/workplace? [Only one answer permitted]

- Higher education/Adult education
- School/Further education
- Government
- National library/Research library
- Museum/Gallery
- Health
- Industrial/Commercial/Legal
- Not for profit/Charity
- Public libraries
- Independent/Learned societies
- Digital
- Not currently working in the library or information sector
- Other (please specify)

Question 2.

Which institution and library are you currently based? (Please note, we will not use the names of institutions for any summaries or research based on this survey.)

[Free text answer]

Question 3.

Which classification scheme(s) do you use? Tick all that apply. [Multiple responses permitted]

- Dewey Decimal Classification (DDC)
- Library of Congress Classification (LCC)
- Universal Decimal Classification (UDC)
- Bliss Classification
- National Library of Medicine Classification (NLM Classification)
- Moys Classification
- BISAC
- ANSCR
- Adapted scheme from any of the above
- Library's own classification scheme
- Other (please specify all other schemes used)

Question 4.

For the following library materials, which classification schemes do you use?

[A grid where one classification scheme was permitted for every type of material, plus a free text box]

Classification schemes
- DDC
- LCC
- UDC
- Bliss
- NLM Classification
- Moys
- BISAC
- ANSCR
- Adapted scheme
- Library's own scheme
- Other
- We have this material but do not classify
- We do not have this type of material

Types of material
- Books
- E-books
- Print journals
- E-journals
- Maps
- Music scores/notated music
- Sound recordings/audio materials
- DVDs/audio-visual materials
- Digital resources not covered elsewhere
- Microfilm/microfiche
- Store/stack materials
- Special collections materials
- Objects/Realia

Broughton, V. (2017). Classification, knowledge organization and subject access. In J. Bowman (ed.). *British Librarianship and Information Work, 2011-2015.* London*:* Lulu, pp. 479-493.

Lee, D. (2012). "Faceted music: towards a model of music classification". In A. Gilchrist and J. Vernau (eds.). *Facets of knowledge organization: proceedings of the ISKO second biennial conference, 4-5 July 2011, London, U.K.* Bingley: Emerald, pp. 339-351.

Lee, D. (2015). "Consumption, criticism and Wirkung: reception-infused analysis of classification schemes". *Knowledge Organization*, 42(7), 508-521.

UDC classification in use: stories from the field

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Introduction

The UDC has been one of the leading general classification schemes over the past century and has been deployed in multiple libraries worldwide. As with other library classifications such as Dewey (DDC) and Library of Congress (LCC), UDC is gradually coming to terms with the digital transition in libraries and the consequent diminution in the importance of classification systems.

UDC stakeholders world-wide, including publishers and library and research communities continuously monitor the use of the system. Usage data are collected either internationally (e.g. Slavic, 2008; 2012), nationally (cf. Makke, 2016) or across different types of applications including those outside libraries (cf. Slavic, 2006). The starting point of such surveys is that there are different types of application of UDC (for collection shelf arrangement or for metadata-based retrieval) and that the scheme's use is distributed between different types of libraries and bibliographic and other information services. Thus, the type of application and associated issues vary greatly; you can observe discrepancies in the practices and applications both geographically and linguistically. There are 136 countries in which there are libraries using UDC, and in 27 countries in Europe (and Central Asia), UDC is used as the main classification system in all type of information institutions. Based on statistics provided by National Libraries and Library Associations in these countries, at least 150,000 libraries using UDC can be counted.

In English speaking countries and outside Europe in general, UDC is used only in certain types of libraries (often only special and academic) and the application scope tends to be different. In English speaking countries, there might be anything from only 5-10 to several hundred, rarely reaching 1000 libraries. Thus, assessing the library needs and practices is rather complex as it demands an understanding of the country's bibliographic culture, library tradition and professional and economic environment.

The UDC Consortium, the owner of the scheme, periodically conducts internal surveys of how the scheme is being used, to better understand how best to adapt and develop the scheme to meet the challenges of libraries today. Thus, in the summer of 2017, a short survey was undertaken to determine how users were deploying the scheme and what problems and issues they faced, so as to inform the strategic direction of both the UDC and the Consortium itself.

This report reflects on the part of the survey related to the UK. The sample of Institutions included universities, special libraries, national libraries and other agencies with an interest in classification and its implementation and others whom it felt would be interesting interviewees.

UDC use in the United Kingdom

Although we do not have the exact number of libraries using UDC in the UK there are some indicators that can help estimate and monitor use of the classification. The last comprehensive survey on the total of UDC libraries in the UK is from 1979/1980 and shows a count of 640 libraries (out of 2,895), 358 of which were in London (Hindson, 1981). The survey was commissioned by BSI, the then publisher of the UDC in English. The complete data with addresses and list of all UDC libraries in England, Scotland, Wales and Northern Ireland is now held in the UDCC archive in The Hague. With 22% of all surveyed libraries using the system, the UDC was, as Hindson noted, the most used classification in the UK after Dewey. His data show that the majority of UDC users were special libraries, followed, by a big margin, by academic libraries.

The interest these libraries have in UDC comes from the very detailed schedule and extensive terminology, especially in sciences and technology (the full edition, published by the BSI at the time was approximately ten times the size of DDC).

From Hindson's survey and BSI customer's data in the UK in the subsequent decades, it is possible to observe a trend of decline in UDC use in the UK. This trend was confirmed by the Consortium's own research reported in Task Force for System Development (1990) and user surveys in 2004 and 2006. Two reasons were recognized as being predominant in the decline: many of the named special libraries listed in the Hindson data were in the industrial sector (chemical technology, metallurgy, pharmaceuticals, manufacturing industry). The notable decline in UDC use in these libraries from 1980s onwards was perceived as a logical consequence of the shrinking of the industrial sector (especially metallurgy and chemical technology) and the closure of libraries or libraries moving from traditional tools to text retrieval systems, abandoning classification all together. The decline of use of UDC in academic libraries, however, is attributed primarily to the decline of funding and libraries' dependence on off-shelf bibliographic data. In this sector libraries tend to migrate from UDC to DDC or LCC for which there is readily available metadata and which therefore do not require the same level of cataloguing staff. Based on what we know, the number of UDC using libraries in the UK is probably now not likely to exceed 100-200, although this would need to be confirmed by proper research.

Apart from an interesting development of the use of UDC to support the implementation of subject gateways in the 1990s (Slavic, 2006), the overall trend that could be noted from sale and research data of UDC in the UK is the one of diminution, which may not be particular to UDC but to library classification in general.

The 2017 survey aimed to provide further insight into these trends in order to determine the issues and the needs of libraries using UDC which might then be addressed by the Consortium. This was a limited qualitative, but in-depth review whereby users were engaged through face to face or email interviews in discussions about their usage of the scheme. Information about UDC use was collected from about 20 Institutions. Thus, the whole has provided a snapshot of views at a certain point and within a limited geographic spread. The results are represented in this paper. Thanks, should be offered to the libraries consulted for their time and thoughts. A full-scale survey is still needed.

UDC Variations

UDC has always been subject to local variation – for example it is recommended that facet order reflects local priorities rather being subject to any standard overarching structure. And so it was that of the libraries we spoke to all the special libraries at least, made sometimes serious changes to the published scheme to cope with the depth of their collections in their core discipline. Thus, the British Film Institute had in effect its own class scheme for film - in house developed but with UDC style notation - whilst the National Maritime Museum varied the facet order to deal with their particular need to highlight naval battles. Even those who largely followed the scheme, local variations would be made, to some extent locking the library into a particular, and sometimes old version of the schedules. This finding was in line with the Task force review where they reported "all had undertaken some adjustments" and "ten of the institutions had been involved in (local) revisions and expansion of the schedules". Another section provided the relevant quote "All the libraries were more concerned with their own situation than the general good of the UDC".

Reclassification

One noticeable and continuing trend is the move away from UDC (and other schema) towards Dewey – and to be more specific Dewey as proposed by national agencies and taken unchanged and largely unchecked. The benefits of this are obvious and are being sought in particular by academic and university libraries; it is less the case with special libraries (though they have their own issues) or to public libraries (where in the UK at least, we suspect most already use DDC).

Thus at least 3 libraries on our list had either already moved to Dewey or were in the process of reclassifying. The primary argument for reclassifying is the consequent economy as the bulk of records can be downloaded at the point of acquisition or even earlier through CIP. Class numbers may not entirely suit the library concerned but that seems to be of less concern, coupled as it can be, with the secondary argument that the print collection is now only a fraction of the total resources available and hence is of decreasing importance. There are also more longstanding issues such as the lack of user understanding (or even librarian understanding) of notation.

But the decision to reclassify is not taken lightly, and at least one library had considered it and decided against given the lack of depth in the DDC scheme. Reclassification will imply a potentially long period of confused sequences, especially if it implies a move from an alphanumeric notation to a numeric. And though the process of assigning new numbers can be done to some extent automatically (there are mappings available) the effort is as much that of relabelling as anything.

Alongside such major decisions are the routine arguments about whether to adopt changes within the scheme itself, as new editions are published and areas revised as new concepts emerge – even the most synthetic schema will require updating. Strategies on this seem to vary but there is a genuine unwillingness to adopt changes unless they are really needed; those libraries who already vary the scheme are less likely to adopt universal changes in those areas and may well just drift away from the authorised version.

The drive towards accepting a shared or pre-provided classification in not confined to Dewey (or LoC). Within the UDC user community outside the UK, there are many instances such as Portugal, Spain, Poland, Slovenia etc. where UDC is recognised as the national system and which implies that a book is classified just once and all parties accept that version. In all such cases, it requires some acceptance that the interpretation of UDC and the assigned class number are correct.

Discovery

Enabling discovery is clearly a key function of the classification scheme and we were interested to see how that was playing out in today's digital library. In its original context UDC would provide a classified catalogue accessible through a separate but linked index. In theory, users would use the subject index to identify relevant class numbers and then search the classified listings for items – though in practice (in the UK at least) they would often go direct to the open shelves. None of this search process has really translated into the online catalogue intact i.e. the extent to which online catalogues support discovery through UDC is varied and often weak. Although there are multiple ways in which UDC can help subjects seeking in the OPAC - Slavic (2006) for example, details 10 different functions based on UDC data held in the bibliographic record and additional functions if the library maintains a UDC authority file - it would appear that classification continues to provide only a limited role in ensuring effective subject searching of collections. Indeed, the project undertaken by Casson, Fabrizzi & Slavic (2011) looked at changes in the UDC offer in Opacs between 2003 and 2008 and it is hard to see that the situation has changed greatly since then. Whichever way, direct user searching of the classification sequence is not common in opacs – indeed of all the users we spoke to, it was not evident in their catalogue. What is more common is for the class number to be hyperlinked at the point of retrieval of a record so as to provide a shelf browse option – though even this is sometimes absent. (Shelf browse may or may not include e-resources depending on whether they themselves have been classified). The extent to which these functions are used in practice is unclear and we suspect forms only a small role in discovery.
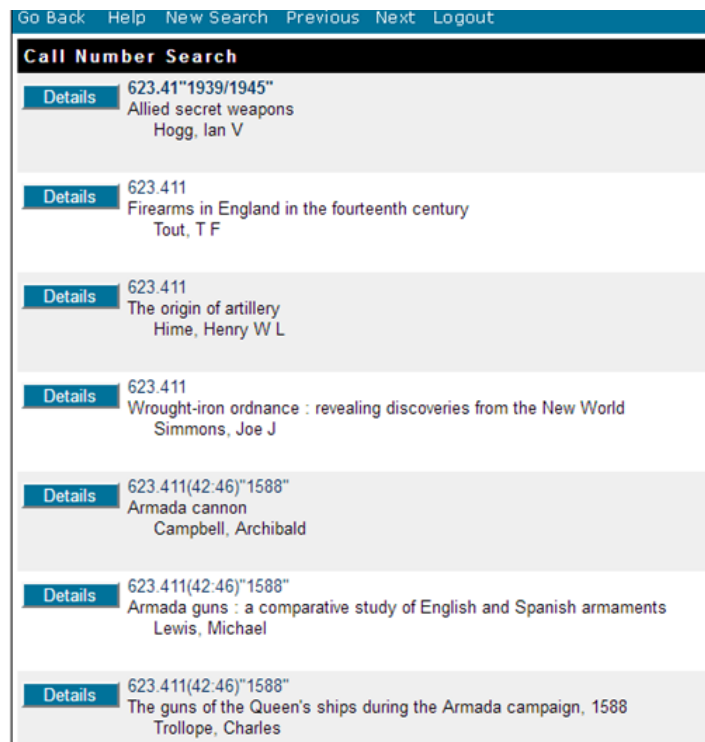
Figure 1 Searching a classified sequence of UDC Numbers (the National Maritime Museum)

There is also evidence that the emergence of web scale discovery layers has to some extent displaced the Opac as first port of call – with some libraries prioritising the discovery system over the Opac. Moreover, is the drift from subject authorities as a means for search to probabilistic searching and even where facets are used in a probability search they are as often as not just keywords or the like rather than anything controlled. A good example of this trend is that of the University of Leuven, where Schallier (2004) reported on the development of an Opac with classified browsing available in UDC at that time but which now provides an Opac based on a discovery system with only limited subject facets to improve precision in searching.

Vocabularies in Library Records

Thus if classification has become less prominent, the deployment of subject terms in the library record has become more critical with the increasing provision of systems based on probability and word matching. All the University libraries in our sample were in one way or another populating their records with subject information - using LoC subject headings or the like if nothing more. The special libraries (all but one) had gone some way towards controlling the vocabulary in their records through the provision and maintenance of a taxonomy. These varied from in house taxonomies -based on national or international bodies often from a mix of sources – to those with a specialised vocabulary being used to manage a core discipline and a more general scheme for everything else. Our interest was in the potential of UDC terminology (captions as they are referred to) being used as a vocabulary to provide a controlled terminology – conceivably also to bring other disparate vocabularies together. This is by no means a new idea; Riesthuis (1990) argued the case for using UDC in this way in 1990 (sometimes referred to as thesurification) – however he also raised a number (8) ways in which UDC captions might present problems as a vocabulary.

Nevertheless, it is an entirely feasible idea and there is no doubt that some libraries are using UDC in this way. Figure 2, (the OPAC of the British Film Institute who use UDC as a thesaurus) illustrates the point. In another case an organisation (a publisher in fact) was proposing to use UDC to semantically enhance their records so a as to improve the search experience. The idea is to map their existing records onto the UDC MRF and then derive the relevant terms to add to the knowledge base. And Slavic (2006) also noted that that over 37% of the libraries she surveyed were using UDC in this way. Given that there are considerable benefits in a multilingual environment for using a scheme such as UDC which can map across multiple languages, it seems odd that it has not been used more in this way; perhaps it is just that UDC is not known as a vocabulary and there are limitations in trying to do so.

Title	TV and screen writing
Material	Book
Author	Lola Goelet YOAKEM (Editor [Library role])
Corporate author	Writers Guild of America
Pagination	124p
Publication place	Berkeley, CA
Publisher	University of California Press
Publication date	1958
Keywords Subject	Scriptwriting: films ; Time and motion study ; Films: uses, specific fields ; Society: reflected in films ; Religion ; Broadcasting: television ; Fiction: adaptation of novels into film

Figure 2 *UDC vocabulary used as subject terms in the BFI Catalogue*

Classification in Repositories

Many libraries worldwide have invested in institutional repositories (sometimes research or open access repositories) to support institutional archiving and publishing. The discoverability of content in these systems remains notoriously weak; see the recent experience of Strathclyde (Macgregor, 2017). We were interested in the extent to which UDC, or more specifically its vocabulary, is being or might be used to populate the subject metadata in repositories; but determining the extent of usage is problematic in that it needs the ability to address e.g. survey all the known repositories for the presence of UDC terms. There is no obvious way in which that can be done unless records in each repository are classified with a UDC notation and identified as such, then of course it becomes feasible. Indeed, we corresponded with the University of Bielefeld who maintain the BASE directory of repositories and Friedrich Summann pointed us to work he and colleagues have done on this issue (Pieper, 2015) Those records which have class numbers can be identified through the relevant data field being populated. He reported that out of a total of circa 77 million records in the BASE directory approx. 4% had a UDC class number. However, those that have any kind of class number at all are a small percentage of the total and it is not possible to determine the extent to which UDC captions may or may not be being used - independent of the class number.

We have noted that discovery in IRs is poor – as Macgregor (2017) said "*Universities to date have probably preferred to focus on establishing the infrastructure repositories and the collection without overly worrying about discovery*". It should be that UDC has a role here in that the drive must be to maximise the exposure of content, to render it retrievable through a mix of search engines and enable its use in a multilingual environment.

Summary

The usage of UDC remains extensive worldwide; many libraries do not have the same challenges as those in western Europe and the States and UDC is thoroughly embedded in their library operations. In the UK, special libraries are particular champions of UDC though they themselves are under threat (many business or technical libraries have closed or merged or effectively subsumed into the intranet). Otherwise there is a drift in classification usage towards increasing standardisation coupled with a diminution in its importance. And this is not the case for just UDC.

The use of traditional classification in search and discovery is limited and yet it ought to have a very positive role to play; repositories and the like lack effective discoverability and a controlled vocabulary such as UDC should be way of correcting that. This might require more project investigation and certainly a greater awareness of the potential of UDC as a taxonomy to bring about.

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The future of classification: knowledge organization in physical and digital space

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Current views of classification, particularly from outside the LIS field, are that it is variously obsolete, unnecessary, redundant, an artificial construct from the nineteenth century which is falsely hierarchical, inaccurate, and founded on wrong ideas.[1] Proponents of such thinking may also argue that, in reality, the world and information about it is chaotic, 'miscellaneous', unstructured, and that relationships between topics are random and transient,[2] so that structured organization systems have no useful function in managing or retrieving information.

Counter to this, one may observe that many areas of knowledge, particularly in the sciences, do display a natural structure with regular patterns of relationships between topics based on their characteristics. The identification of such patterns and regularities provides much of the basis for theorising about the physical world and the consequent formulation of scientific laws and paradigms, and incidentally gives us the conceptual foundation for classification, both scientific and documentary. Often the purpose of the theory is to build a model of the world, to understand the way in which the world works, and to infer from the data you have knowledge about the world which is as yet undiscovered. This kind of thinking dates back to the ancient world and the origins of natural science and philosophy, and is exemplified throughout history in the work of such thinkers as Aristotle, Ramon Lull (whose logic diagrams are regarded as an early form of programming),[3] Roger Bacon, John Wilkins, John Ray, Carl Linnaeus, Francis Bacon, Gottfried Leibniz (a sometime librarian, and another precursor of artificial intelligence),[4] Dmitri Mendeleev (with his periodic table of the elements, a near perfect classification), and in the twentieth century by information theorists and designers of classification systems including Paul Otlet,[5] H. E. Bliss[6] and S. R. Ranganathan.[7]

It should be conceded that in the social sciences, arts and humanities such naturally occurring structures are harder to discern, and attempts to impose them can be seen as inherently artificial and occasionally fantastic, as in the essays of J. L. Borges,[8] himself a library practitioner in his early life. Man-made classifications (although not necessarily bibliographic ones) have more recently been regarded as potentially socially and politically dangerous, where they privilege certain viewpoints and perceptions of the world.[9]

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3. Martin Gardner. "The ars magna of Ramon Lull" in *Logic machines and diagrams.* Chicago: University Press, 1958. pp. 1-27; and Anthony Bonner. *What was Lull up to?* http://www.ramonllull.net/sw_studies/studies_original/compbon.html

4. Jonathan Gray. "'Let us calculate'; Leibniz, Llul and the computational imagination" *Public domain review* https://publicdomainreview.org/2016/11/10/let-us-calculate-leibniz-llull-and-computational-imagination/

5. Boyd Rayward (Ed.) *International organization and dissemination of knowledge: selected essays of Paul Otlet.* Amsterdam: Elsevier, 1990

6. H. E. Bliss. *The organization of knowledge and the system of the sciences.* New York: Holt, 1929

7. S. R. Ranganathan. *Prolegomena to library classification.* London: Asia Publishing House, 1967

8. J. L. Borges. "The analytical language of John Wilkins" http://www.alamut.com/subj/artiface/language/johnWilkins.html

9. Geoffrey Bowker & Susan Leigh Star. *Sorting things out: classification and its consequences.* Cambridge, Mass.: MIT, 1999

Nevertheless, in the efficient management of information some systems of ordering must be employed in order to organize large information stores, whether physical or digital, and to enable information retrieval through the allocation of metadata, and the use of search and browse mechanisms. In that context, an important role of the classification system is to represent the subject of documents, either in terms of their content, for retrieval purposes, or in the relationships between concepts and the structure of the subject domain, to support browsing. In an age increasingly attached to the visualization of data, organized 'maps' of information play an important part in access to that information, and classificatory structures supply the underpinning of such tools.

Modern classification theory dates from the beginning of the twentieth century, although its roots can be found much further back in history, and in a variety of disciplines. Writers such as Bliss, Otlet and Ranganathan built on ideas from philosophy, logic, languages, science, and mathematics to explore the nature of classes, concepts, and terminology, to look at structures and relationships, and to consider the representation of subjects through coding and notation, most precisely formalised in Ranganathan's triple of the idea plane, the verbal plane, and the notational plane.[10] The close interrelationships between these different aspects of the information domain help to triangulate the theory and confirm its existence in different manifestations of knowledge organization systems, or KOS. The development of such a proper body of theory for classification gives us the philosophical rationale for knowledge organization, together with a methodology for building classificatory structures, whether they be classification schemes per se, thesauri, subject heading lists, or, more recently, taxonomies and ontologies. The common ground between these different kinds of tools reinforces the idea of a generally applicable fundamental theory, a sort of documentary 'theory-of-everything', and, in the twenty-first century, work on the semantic web and on web ontology has drawn on this earlier library and information science research to inform automatic indexing and retrieval and machine reasoning.

Although there are different schools of thought about classification theory, the most significant in the twentieth century has probably been faceted classification, initially conceived by Ranganathan, and further developed by the Classification Research Group in the UK,[11] and the Documentation Research and Training Centre in Bangalore.[12] Faceted classification has influenced nearly all modern KOS, in both traditional information organization and management, and in online information work.[13] We might ask what features of classification in general, and faceted classification in particular, make it especially suitable for contemporary knowledge organization. Firstly, it is very logical and predictable, with a clear, regular structure; this means that the classification data can easily be held in a database, as the relationships are explicit and identifiable. Secondly, the way in which the system works, its rules for building and linking (the system syntax) are also very regular and consistent, which makes it highly compatible with machine 'understanding' of the system. A faceted system is very like a natural language, except without all the irregularities and idiosyncrasies of natural language. When the rules for building are applied, as when classmarks are created for complex subjects as they occur in documents, a very elaborate structure can emerge, just as phrases and sentences are created in language. This is very much in line with the idea that Ranganathan was inspired by the engineering toy, Meccano, where very complicated models and machines can be created from a set of fundamental parts.

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Whatever one's opinion of the correctness of classification schemes, there is not much evidence that physical collections of documents intend to abandon them, although it is true that in recent times additional methods of retrieval have been introduced to many libraries.

What does seem to be the case is that there are now fewer schemes in operation, with the big two, Dewey Decimal Classification (DDC) and the Library of Congress Classification (LCC), being dominant.   In a recent survey of UK academic libraries,[14] of the first fifty institutions in the universities' league table, 20 used DDC, and 18 LCC. Six libraries used a local scheme, and the remaining six used Garside (2), Universal Decimal Classification (2), Bliss (1), and the National Library of Medicine classification (1). The age of the large scale re-classification project appears to be over, most of these having been from a local or less popular scheme to DDC or LCC, and few are reported in the professional press in the last five or six years. What is apparent is that many multi-site libraries, formed from the merger of institutions with a variety of schemes, are now more tolerant of that variation, with 15 libraries showing evidence in the main catalogue of multiple classification schemes. Partly this may be explained by the lack of financial or human resources for reclassification, but the role of other tools in retrieval removes dependence on the classification scheme for this purpose. Of the 50 libraries, 48 were using Library of Congress Subject Headings, doubtless because in many cases these came as standard in imported or outsourced bibliographic records.   A more conscious choice would be for discovery tools, now used by all but one of the libraries surveyed.[15] The same convergence towards a small number of proprietary systems could be seen, with 33 libraries opting for Primo; Encore (9), Summon (5), and Ebsco (1) were the runners up, with one example of an in-house system. Such tools do not, of course, replace the more conventional means of representing subject content, since they rely on bibliographic data from the catalogue as the basis of search, a fact that seems sometimes to be missed by senior managers.

The classification scheme also remains essential for physical organization of books, and for browsing, and it is notable that many libraries continue to use classification for electronic resources such as e-books, and in some cases in institutional repositories.

The great majority of public libraries continue to use DDC in some shape or form (with the notable exception of LCC at Edinburgh), even where they may supplement this with a reader interest or categorization system in parts of the collection. In such cases the categories are often derived from publishers' classification data,[16] and a recent innovation has been the development of a more complex scheme, Thema,[17] which is being promoted as an international standard.[18] It has 2,700 classes, and can be used post-coordinately, making it amenable to 'faceted search'.

Such innovations are interesting, because, while they indicate dissatisfaction with older classification schemes, they demonstrate the continuing need for subject organization, metadata to facilitate search, the means of representing of complex content, and the enabling of more sophisticated search techniques. So while specific systems may have gone out of favour, the general concept of classification continues to be relevant.

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16. A. Hopkinson, "BIC and the E4libraries accreditation scheme" *SCONUL focus* 52 2011, 39-41 https://www.sconul.ac.uk/sites/default/files/documents/13_2.pdf

17. *Thema and UKSLC* http://www.bic.org.uk/86/THEMA/

18. Howard Willows. (2015) "Book description standard goes worldwide" http://www.bookbrunch.co.uk/article_free.asp?pid=book_description_standard_goes_worldwide

The same phenomenon can be observed in the wider, and wilder, unmanaged environment of the web. All the features of a knowledge organization system that demonstrate the good conceptual basis and sound theory developed in the last fifty or so years are highly relevant to subject organization and retrieval in non-library contexts. They can be seen in equivalent tools, and in a parallel strand of literature, and some particular features of classification schemes can be observed as key in various types of tool.

One of these is what is commonly referred to as faceted browse, in which a website interface is set up as a browsing tool by the organization of its content as a series of distinct 'facets' characterized by different attributes. This type of structure is very common in e-retail sites where the combination of the different facets allows the customer to formulate a search for quite exact products, such as a variety of wine specifying the colour, degree of dryness, country of origin, and so on.[19]

At a more complex level, the same methodology enables the building of a theoretical model for a domain for use in, for example, an organizational taxonomy, an educational website, or a modern multi-purpose knowledge organization tool.[20] Faceted structures and faceted techniques are evident in a range of 'non-classifications' that all have underlying classificatory functions. Standards and specifications for thesauri, topic maps, search software packages, taxonomies and ontologies all show evidence of the influence of faceted classification theory.[21] Of particular interest is the Semantic web application SKOS (Simple Knowledge Organization System) which aims to represent controlled vocabularies using a web ontology language.[22] SKOS identifies a range of structures and relationships inherent in classifications (notably faceted classifications) such as hierarchy, broader, narrower, and associative relationships, membership of facets and sub-facets, and values of concepts in array. Use of the SKOS version not only enables straightforward search and retrieval, but like other ontology work supports intelligent search, since the search software includes an inference engine which allows the system to make logical deductions about relationships in the domain on the basis of its knowledge of the system rules. Like Lull's logic diagram, and Mendeleev's Periodic Table before it, the ontology allows the system to use the knowledge it has to predict as yet unknown knowledge.

Overall, the need for careful analysis of concepts in the domain, and the rigorous and logic structuring of these concepts is the key to effective access to resources in a way that can be easily understood by both humans and machines. The theory that has been developed for the design and construction of the traditional bibliographic classification scheme is a vital foundation for the creation of these more contemporary tools, and to that end the thinking of library and information scientists over the last hundred years, and the lessons learned in classification lectures in library school, remain relevant to a new century and a new generation.

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20. Mike Atherton. "Domain modelling at the BBC" (http://www.slideshare.net/reduxd/domain-modelling-at-the-bbc?related=1)

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Reclassification of University of Sussex Library local language and literature classes to Library of Congress
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Tim Haillay, Cataloguing Supervisor, University of Sussex Library

Context

The University of Sussex library was founded in 1961. The original library management team decided to adopt Library of Congress classification (LC) because it was considered more appropriate for an academic collection. However, largely down to the innovatory spirit of the professional librarians at Sussex in the early days, who believed LC to be out of date for certain subjects, modifications were made to the LC schedules. For some subjects (literature, philosophy, fine arts, music, geography, anthropology and social sciences) wholly in-house schemes were designed using the same first-level class letter as LC, but, in the example here of the social sciences (based on the then leading current international bibliography), continued very differently:

Radically speaking : feminism reclaimed / edited by Diane Bell and Renate Duelli Klein

Sussex	LC
HC	HQ
6400	1190
RAD	.R33

In 1969, a Library Unit Plan was produced outlining the need for the library "*to achieve conformity with an established classification scheme*" (Young, 1969). M. Burton, in her classification policy document, argued the case for reclassification and against the continuance of the local scheme (Burton, 1969). Reclassification began with fine arts and continued on a subject by year basis. Figures available at the time showed that the library was acquiring more books in the local schemes than were being transferred to LC: i.e. staff were getting steadily more and more behind as the putative benefits were becoming ever more distant (Peasgood, 2017). The librarians did manage to reclassify some literature: French (Sussex PE to LC PQ), solely as PQ was unused in the local schedules followed by Italian, Spanish and Portuguese (to PQ) and non-UK world Englishes (to PR) but reclassification was effectively abandoned by 1979. The result is that current staff have been left with the legacy of a series of local classmarks that have not been expanded or revised since reclassification was abandoned. Additionally, the American, English, Germanic and Scandinavian literature classes will soon be temporally obsolete due to the logic underlying the scheme.

The literature classses in question are based on the date of birth of the author:

William Blake (1757-1827) = PF 75700/04

Oscar Wilde (1854-1900) = PF 85400/01

Hilary Mantel (1952-) = PF 95218

Linton Kwesi Johnson (1952-) = PF 95219

Authors with 5 numbers (eg. Blake):

00	Complete works
01	Selected works + first 3 of editor's surname
02	Individual works + first 3 of title
03	Biography + first 3 of author's surname
04	Critical studies and bibliography + first 3 of heading

Authors with 2 numbers (eg. Wilde):

00 blank	Complete works and selections
00 + first 3	Individual works
01 + first 3	Critical studies and bibliography

Authors with 1 number (eg. Mantel and Johnson):

Blank	Works by
First 3	Critical studies and bibliography

The problem with this logic arises once we begin to classify writers born post-2000. How do we keep the sequence chronologically robust and future-proof? After considering suggestions to modify the local schema, the decision to begin the project to reclassify to LC was unavoidable.

LC PE (English language) had already been used for a large collection of reprints of early English works, having been freed up by the aforementioned move of French lang/lit to LC PQ, so we decided to test our methods on this relatively small number of items.
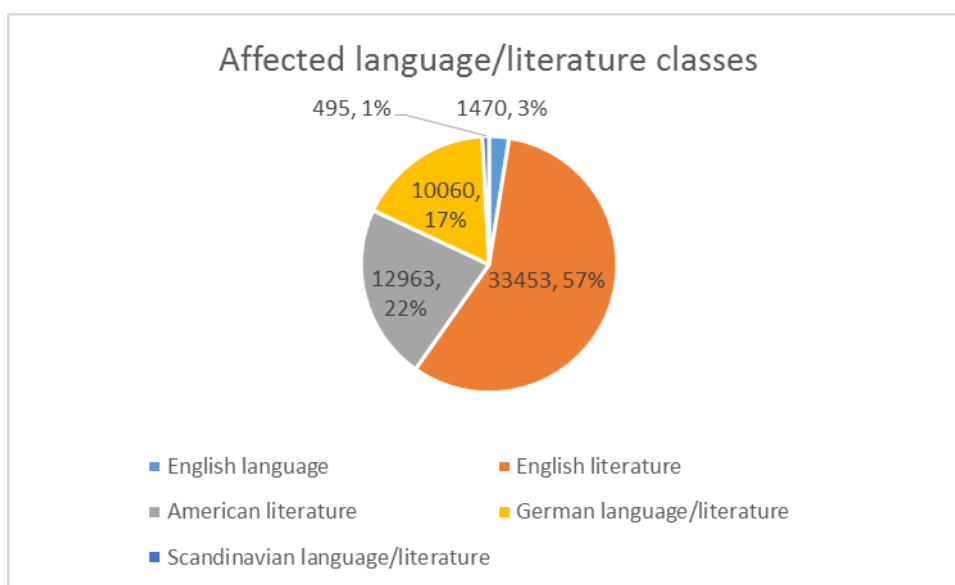
When we started **Phase 1** of the project in early 2014 the library was using Talis as its LMS. Using Talis Decisions, its business information system, we reported on all works in affected classes and saved the data on Excel spreadsheets. Working from these, we reclassified and added the new classmarks to both the spreadsheet and the work level class tables of Talis as an addition to that of the main work level. This way we could work steadily (as time allowed) through the cataloguing side of things before we 'released' this initial part of the project to Frontline Services for book processing. New works acquired after the reports had been run were reclassified straight to Talis work level. New works of fiction by authors yet to be classified locally were classified straight to LC. The reclassification work was carried out by the trained cataloguing staff: 1 x full-time senior library assistant and 3 x 0.5 hours library assistants. Because of factors including the lack of 'time-stamp' on the project and the fact that it has been/is being subsumed into our daily workflows, the outsourcing of the reclassification element (to OCLC for example) was not considered.

In terms of online tools we have a subscription to Classification Web which was and is consulted extensively when assigning new classmarks. Kyle Banerjee's 'Cutter calculator' has proven invaluable in doing just that, and the LC 'Distribution of Cutter numbers for biography and criticism' table is being used to subdivide the Zs to (largely) 3 numbers.

Sussex PF (language only) to LC PE was completed in good time for temporary staff to be taken on for the small Summer 2014 book processing and stock move. Cataloguing staff started on the reclassifying of the Sussex classes that were moving to LC alphabetically last (the reason will be discussed below), in this case PJ and PK to PT.

In July 2015 we moved to our new LMS, Alma. Unfortunately we were not able to map the added work table classes from Talis but thankfully we retained the data on Excel spreadsheets. New classmarks from those records processed on Talis were transferred to the 050 LC class field of the marc records and all subsequent reclassification in Alma has followed suit.

Overview

Affected language/literature classes

- 1470, 3% — English language
- 33453, 57% — English literature
- 12963, 22% — American literature
- 10060, 17% — German language/literature
- 495, 1% — Scandinavian language/literature

Phase 1 (pilot): Reclassification and movement of English grammar, PF 240-994 (approximately 1,500 items). As the smallest stock move, this would act as a pilot and inform decisions on the next 3 phases. Movement of stock - July/August 2014.

Phase 2: Reclassification and movement of PJ and PK to PT. Movement of stock - July/August 2017.

Phase 3: Reclassification and movement of PH to PS. Movement of stock planned for July/August 2018.

Phase 4: Reclassification and movement of the remaining PF works to mainly PR. Movement of stock planned for July/August 2020.

The project, conceived as a joint effort between Content Delivery (assigning new shelf marks) and Frontline Services (reclassification, relabelling and moving), was planned with Spalding's (2011 pages 41-43) design principles in mind. The reclassification work was undertaken away from library users, and we ensured that the space was large enough for staff to store the books and work safely. Each step was documented, we communicated our plans to library users via informational posters and the library's social media accounts, and we set achievable targets for the staff assigned to the project.

Weaver and Stanning (2007 page 65) suggest that a notional time of three minutes should be allowed for the reclassification of each item. That includes updating the library management system, changing the spine label, and shelving the book. We used that time frame to inform our project planning.

Phase 2 - Procedure

The Reclassification Working Group (3 faculty librarians and 3 clerical staff) programmed the PJ and PK to PT reclassification project to take place over the 2017 summer vacation. The project ran concurrently with the library's annual summer clean. PJ consisted of 495 books (3 bays; 19m), and there were 10,060 books (55 bays; 347m) shelved under PK.

We employed six temporary members of staff (working hours equivalent to four fte). Three of the temporary workers were members of the library's shelving team, and three were students who had recently completed their undergraduate degrees. The Shelving Supervisor and the Frontline Services Librarian oversaw the project.

Fortuitously, we had recently moved a large number of items from our Official Publications collection to the basement, which freed up 96 bays of available rolling stack (996m). All PJ and PK books were removed from the shelves, cleaned, and transported 112m to the rolling stack, where they were shelved in the same order. This took two days.

Books in LC classes PL-PS (38,000 items; 171 bays; 1078m) were cleaned and moved to make space at PT. Not all PJ and PK items were reclassified as PT. German language books will eventually be shelved under PF, but they will remain under PK for the time being. The PF shelf mark is currently home to our English Literature collection, and we thought it would be confusing to have an enclave of German language books in amongst English Literature! So, the German language books will be moved from PK to PF at a later date.

Space was left between PH and PL to accommodate the language books that would be returned to PJ and PK. The movement and cleaning of PL-PS took eight days.

For the next stage of the reclassification process, we set up two work stations in a study area near the rolling stack, each consisting of a PC, a scanner, and a Brother P-Touch label printer. In total, 230 spreadsheets, in new PT shelf mark order, were printed from the Alma library management system, giving the following details:

Title (and volume number, if required)
Old shelf mark number
New shelf mark number

Each spreadsheet contained 40 titles. Staff members worked through the spreadsheets, picking the listed books from the rolling stack in the new shelf mark order and taking them to the workstations. Using Spalding's (2011) guidelines, we set an achievable target of picking 40 books in 30 minutes.

At the workstations, the books were reclassified on Alma, labelled, and returned to the rolling stack in the new PT order.

We noted that the picking and processing of books speeded up significantly as staff became used to the various processes. As the project went on, staff were able to locate 40 books in as little as 15 minutes. The process of Alma reclassification and labelling took 40 minutes for 40 books. In total, this part of the project was completed in 19 days.

Once all of the books were changed and labelled, they were returned to their new area next to PZ. They were shelved in reverse order (i.e. highest number first) to ensure adequate spacing. Books remaining in PJ and PK were also returned. This took two days.

The entire process of moving and reclassifying the books took 23 days, using 4 fte staff.

Discussion

As explained above, the Sussex schema assigned PF to Englishes, PH to American Literature, and PK to German. The Reclassification Group chose PJ and PK to PT to be reclassified first for two main reasons:

- It is the smallest collection of the three big remaining literatures, and would be used as an extended pilot. French had been reclassified as part of an earlier reclassification programme, and English Language was moved to PE in 2014 – the original pilot scheme.

- We reasoned that if we reclassified and moved PJ and PK to PT first, then we wouldn't need to move it again when we reclassified PF and PH to PR and PS respectively.

There was much debate in the Reclassification Group, and amongst other library staff, about the order of movement. Some wondered if it was necessary to move PJ and PK to the rolling stack first. Couldn't the same result have been achieved by picking books in the new PT order from the original shelves? The short answer is yes, the practical answer no. As Spalding (2011) suggests, it is good practice to carry out significant work away from users. The area allocated to undertake the reclassification was closer to the rolling stack than the original PJ and PK area. The original PJ and PK area was next to a large number of study spaces. We decided that it was better to have two intensive days of trolley movement passing the study space, rather than nine days of moderate disruption. The new PT area is located on the opposite side of the study space, nearer to the rolling stack, and can be accessed through the book stack. Also, this area was part of the clean-up and needed to be programmed into that process.

The reclassification of PH to PS is programmed to take place next year (2018). PF to PR will probably be reclassified in 2020, as this will require significantly more preparation due to its size.

Conclusion + lessons learnt

The need to conform to a worldwide classification system that is an industry-standard in terms of efficiency has become more and more necessary in recent years in terms of data interoperability. We have highlighted how, in the 1960s, the staff at Sussex developed their own schemas, which worked well at the time, but which do not now meet our requirements. The move to our new LMS, Alma, has enabled us to perform bulk data changes much more effectively than has been possible in the past. On a local level, this has been an excellent joint venture between the Content Delivery and Frontline Services Sections and a model by which we can consider future internal reclassification projects.

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Moving from an in-house classification scheme to a standardised scheme: an outline project plan

Jane Del-Pizzo, Acquisitions & Cataloguing Librarian, The University of Law

History of our scheme

Since 1994, The University of Law (formerly The College of Law) has had its own classification scheme, a simple four letter notation for broad subject headings in the areas of law in which we offered modules. This classification scheme is in use over the University's eight centre libraries. Over time, as courses changed, new subject headings and classmarks were added to our scheme. In 2015, the University announced the launch of its De Broc School of Business and, with the planned purchase of resources to support the new courses, it was clear that our classification scheme would have to adapt to accommodate these. In the summer of 2016, work was undertaken by the library team in London Bloomsbury to augment our current classification scheme and to provide a separate collection for students studying business and finance. However, in time it became apparent that trying to fit resources into the schemes was not without problems. One of the problems that we encountered, was that there are some resources which are dual use to both business and law. According to whether a particular resource was purchased for law or business, meant that copies of the same title could therefore be shelved in different places within our London Bloomsbury library! In addition, some of our classmarks were not sufficiently well differentiated e.g. planning, land and conveyancing have separate shelfmarks. With the planned rollout of De Broc courses to other centres in time, it was felt that the current arrangement would not work in centres with more limited library shelving space and did not enable students to find easily the resources that they needed by browsing the shelves. As the University continues to expand the courses offered, both through strategic partnerships with other higher education institutions and with additional subject areas being considered as part of joint law degrees, it became necessary to carry out a review of our classification scheme to accommodate current and future course offerings within our libraries. The project scope (beginning in April/May 2017) was therefore to plan for reclassification of materials at all of our centre libraries by the end of summer 2018, to run concurrently with another project to replace our library services platform (LSP).

Dealing with staff and time constraints

Although ULaw has a professionally qualified librarian at each of our eight centre libraries and a small central team, many of our staff members are part-time and geographically dispersed. With focus also on the replacement of our LSP, this had to be borne in mind when requesting staff resources from the centres. In the initial stages I worked closely with the Head of Libraries and one of the Senior Library Assistants at London Bloomsbury with assistance from our Library Systems Officer. The initial part of the work was reviewing possible classification schemes open to us and reviewing schemes in use by other higher education institutions. A lot of this initial work was done by teleconferencing and by sharing documents on SharePoint. Additionally, the library teams at the centres were consulted by email and asked for input.

A range of classification schemes were originally considered. It was important to us that any classification scheme that we selected, be especially strong within the subjects of law and business. Although we were not looking for an identical match with our in-house classification scheme, it was important to us that mapping from the old system onto the new one, not be too complex, given time constraints and staff resources available. Because some of our students may only study with us for one year (on the postgraduate courses), we also wanted to avoid any classification scheme which would involve a lot of work for users to familiarise themselves with. Dewey Decimal classification was rejected by many of our staff members due to the long strings of class mark numbers which would have been required within a specialist collection such as ours.

Additionally, schemes which required further training use by staff were rejected, due to time constraints associated with implementing the new LSP as well as reclassifying and relabelling items, while continuing to provide full service to students (some of our courses have different start dates throughout the calendar year, so consequently some centres do not have significant windows of time for project implementation). Following an article in CILIP Update,[1] we reviewed Thema,[2] paying close attention to correlations between our subject areas and the Thema scheme. After due consideration, the core project team recommended the adoption of Thema, due to its relative simplicity and freely available resources. We demonstrated the scheme at our annual wider team meeting in Manchester in June 2017 and this was approved for adoption by a simple majority of the librarians.

The LSP project unexpectedly gave us an opportunity to complete some of the mapping work face-to-face and to include more members of the wider library team in the project. As vendor presentations were arranged over a four-day period in London in August 2017, several of us were therefore staying in the same city at the same time (a rare occurrence for our wider team!) and we were therefore able to hold face-to-face meetings to discuss some of the mapping issues after the LSP presentations had concluded. To give an idea of our team distribution, we therefore had staff from Chester, Derbyshire, Guildford, Birmingham and London able to meet over four days. We were also able to consult with library staff at our London centres, an important consideration, given their experience with a wider range of students and resources and some of our other centres.

Facilitating the move to the new scheme

One of the fortunate aspects of dealing with the reclassification of legal resources, is that we generally have a higher turnover of stock than would a research library, because we are equipping our students to deal with current law. Our first step (and indeed this is an ongoing one), was for our Library Systems Officer to produce a series of reports on outdated and superseded stock for withdrawal, to eliminate relabelling out of date resources. This again ties in with our LSP project, and has the twin benefit of only transferring current data to our new system.

Reports have been crucial to the first part of the project. In particular, knowing our most populated classmarks, has meant that during face-to-face meetings we've been able to concentrate on resolving any mapping issues for those classmarks. Classmarks with much smaller quantities of items, were therefore dealt with by email where we ran out of time, as in the example below:

Shelfmark	Shelfmark Count
ACCT	1
ARBN	354
Ask at Enquiry Desk	10
BNFN	727
BNFN.INS	1
BUSN	970

1. Green, Rob. (2016). Subject classification goes global. *CILIP Update*. September, p34-35.

2. http://www.editeur.org/151/Thema/ accessed 29th August 2017.

The next step was producing a shelfmark correspondence list, matching up our shelfmarks to the Thema scheme and agreeing clarifications and refinements. Because we were working within quite a small timeframe with limited face to face meetings, this did give us the impetus to reach agreement relatively quickly on some areas where there was a divergence of opinion. It is amazing how a looming deadline can focus attention!

As of the end of August 2017, our next steps are now to produce a list of all the Thema shelf marks we expect to use within the first year of adoption and to circulate this to all members of library staff for any final comments to be incorporated into the scheme (with a view to regular revisions in subsequent years to take account of any change in our resource holdings). The aim is to do this by the end of September 2017. With a geographically dispersed library team, it is important to reach agreement on broadly similar times for adoption in each centre, whilst taking into consideration each centre's own timetable. We have an annual library assistants team meeting in October 2017, so the project will be presented at this meeting to keep every member of the library team informed and to work together on final project implementation times.

From October 2017, each MARC record on our current library system will have two shelf marks, one for our old in-house classification scheme and the other for the Thema classmark. There will be a data transfer from of our current Voyager library system to the new LSP before June 2018, so we anticipate that some work will carry over from Voyager to the new system. The plan is for each library will then be able to undertake relabelling at a pace which suits it, with the last library to relabel each item, deleting the old classmark as it does so. We have estimated the amount of time it will take to relabel each item, giving us an estimate of the staff resources which will be required over the following year. This allows us to put in a request for temporary additional staff, if required. Additionally, one of our smaller centre libraries at Chester is transferring to a new city centre location during summer 2018, so it is likely that at this site the relabelling will be done as part of the relocation project.

Mapping classifications and linking related classes through SciGator, a DDC-based browsing library interface
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Introduction

The plurality and diversity of KOSs on the horizon of documentary institutions and the missing of index unification at different levels (local, national, international) disturbs the interoperability of bibliographic data and makes a documentary research less pertinent. Web 3.0 is still a vague promise of interconnection between machines and tools and of an easy exchange of bibliographic data. The first step into the interoperability of the records in the OPAC is the provision of tools allowing mapping of different index vocabularies in the same documentary area or institution. With the information explosion and new trends in science that prefer interdisciplinary studies, plenty of contemporary published documents now deal with several subjects touched on the same work. Because of the limitations of enumerative classification schemes (often chosen for indexing documents in university libraries) where the combination of concepts from several disciplines is complicated or impossible, interdisciplinary aspects are not made retrievable enough. Today, with relational database systems and PHP, Java or HTML languages, adequate online tools linking different disciplines can finally be proposed.

SciGator [1],one of the rare tools that join mapping of index vocabularies and linking of related subjects on one and the same interface, was created in December 2014 by the Library Service at University of Pavia, Italy. As a general reference KOS, SciGator adopts the Dewey Decimal Classification (DDC), which is also used as a basis for linking related classes and mapping other schemes. The DDC-based browsing library interface was presented on June 28, 2017 during the Symposium of the EDUG Annual Meeting held at the National Library of France in Paris[2]. With the present paper, we invite you to discover this innovative tool and to navigate with us in the OPAC.

DDC in Italy

Nowadays, DDC is the most used classification scheme to index documents in Italian libraries, which increases the potential interoperability of the local catalogues with other information resources and tools. An Italian version of the online DDC schedules exists, called WebDewey Italiana, to which the scientific libraries of the University of Pavia are subscribed. These libraries were quite scattered until 2009, when they were reorganized into 8 libraries and three of those, The Science Library, the Science and Technology Library and the Medical Library, were converted to a DDC-base shelving system. Conversion of documents in these libraries still progresses, while other libraries are considering to join this classification network as well.

Origins of mapping and linking interface

Unfortunately, each of the Pavia scientific libraries is still physically divided into several sections, each with a different tradition of shelving based on local schemes. Moreover, they are in different positions in the town. So, books on related subjects or on the same subject are often shelved in different places, which is a potential source of confusion for users. In this situation, the Library Service staff realized that DDC may work as a virtual bridge between different local schemes and shelvings.

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1. SciGator interface: http://scigator.unipv.it/

2. EDUG, Annual meetings, 27-28 June 2017: http://edug.pansoft.de/tiki-index.php?page=2017+meeting . A short report of the meeting is available on *025.431: The Dewey Blog at http://ddc.typepad.com/025431/2017/07/2017-european-ddc-users-group-meeting.html*

Moreover, input of a subject heading in the bibliographic records during the cataloguing process is not an available option. So, bibliographic records in Pavia are only indexed by subject when they are derived from the SBN national bibliographic database. For the other records, shelfmarks are the only database field where subject information can be stored.

Furthermore, a well-known limitation of DDC is that it forces every item to be shelved or indexed under a specific discipline. That implies a loss of information on related subjects discussed in the same work. For example, many books owned by our libraries deal with mathematical subjects applied to physics, or with building subjects applied to architecture. This factor stimulated our staff to look for a tool allowing more interdisciplinary searches.

All the above considered, the Library Service came up with the idea of SciGator, an interface allowing to browse DDC classes adopted in Pavia libraries and at the same time to navigate from these to related DDC classes or to equivalent classes in different KOSs that are also used to shelve documents.

SciGator database structure

Like many of the modern search tools, SciGator is a relational MySQL data base structured in 6 main fields, as we may see in Fig. 1:

1. 'notation' – a DDC number, for example: *628.9*
2. 'caption' - a WebDewey Italiana name of the DDC class, for example: *protezione antincendio*
3. 'captione' - English translation of the DDC class, for example: *fire prevention*
4. 'scopenote' - notes
5. 'seealso'- a DDC notation of a related class, for example: *363.1 (public security)*
6. 'equivalent' - notation of an equivalent class in a local scheme, for example: *AR16 (fires)*

Fig. 1 The SciGator database fields

SciGator Web interface

SciGator interface is written in PHP language and managed by phpMyAdmin software tool and has a tree structure. Subjects can be found under their respective disciplinary class, or in a linked class in the network of cross references, as you may observe in Fig. 2. So, in this case 628.9 (fire prevention) is our root notation. Then, its related class 363.1 (public security) is connected by an arrow '→' and its equivalent in a local scheme AR16 is connected by around sign '≈'.
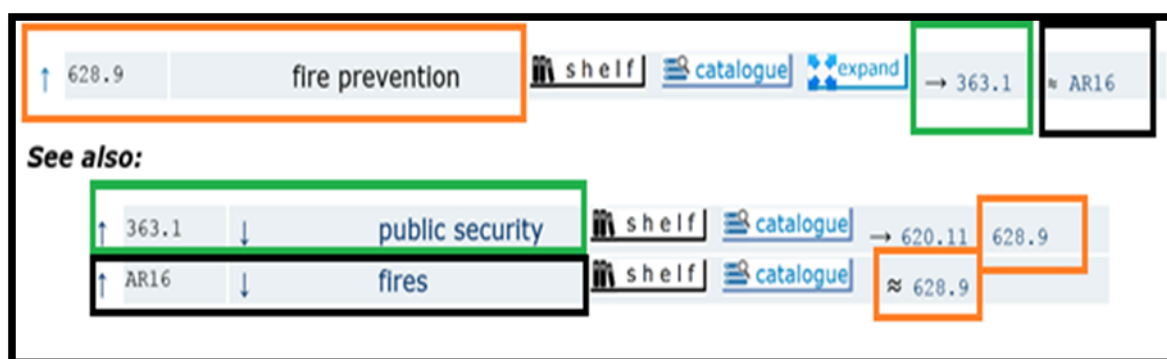

Fig. 2 The SciGator interface

Browsing functionalities

At present, SciGator interface proposes 3 browsing functionalities in the form of 3 buttons displayed between the root caption class and the related classes (Fig. 2).

The first one, '*shelf*' (icon with black book spines), allows the user to retrieve all documents having a shelf mark that begins with the corresponding notation. Its subclasses will also be included because of the default right truncation. The second one, '*catalogue*' (icon with a lens and a blue list of records) enables the user to retrieve all documents having the corresponding notation as their shelf mark or as a subject metadata coming from SBN - Italian National Catalogue. The last one, 'expand', (icon with four divergent arrows), enables query expansion by retrieving all documents in the previous options plus documents shelved or indexed by related classes, including both associated DDC classes and equivalent classes in local schemes. Then, after each browsing action, the user is redirected to the OPAC interface when he may consult the results of its research. All the obtained records are sorted by descending date of publication to answer better the scientific needs of users, asking generally for the most recently edited documents.

Some limitations

The limitations of this tool are those of the online catalogue in which searches are launched. For example, the final notation for all the learning and exercises books, especially used in mathematics textbooks, is *07*. But in the catalogue only right truncation is possible. So, in SciGator as well, a search for only exercises books (of calculus or geometry ones for example) won't be allowed because the search by left truncation is not available.

Furthermore, all the 3 browsing options proposed by SciGator interface often produce a great number of results, but the last one especially ('expand in the catalogue') may also increase noise, due to the well-known inverse proportionality between recall and precision. So, each user should be informed about that and take it into consideration during her expanded search.

Future work

Ideas for possible developments of SciGator increase day after day. Among others, we plan to eliminate the '*catalogue*' button in the case where a class is from a local classification, as in practice only DDC classes can be found in catalogue records besides shelfmarks.

Another need would be to collect statistical data about the use of SciGator, which may allow us to identify categories of users and estimate their number. We suppose that SciGator interface is used the most by librarians, but we would like to reach other categories of users.

We are also aware that the Web interface should be improved through more user-friendly graphic design. Moreover, adding buttons for searching the same DDC classes in the SBN national catalogue and/or WorldCat browse button seems to be especially useful for interlibrary loan services.

Conclusion

In short, SciGator seems to be an effective mapping tool between DDC classes and their equivalents in local schemes and makes interdisciplinary search possible. This experience also shows how classification schemes have the potential to provide more powerful search tools than is currently the case on most information services.

Cooperation around a single tool between staff who came from different disciplines: librarians, information computer specialists, ERASMUS+ interns and the boys and girls of Alternative Civilian Service, including the authors of the present paper, proved to be successful. Librarians working at the front desk found SciGator a useful tool. We are now waiting for users' feedback, which would allow us to ameliorate its interface and to make it more user friendly.

Similar tools are starting to emerge on the European field. Norwegian mapping software 'CCMapper'[3] or German project 'coli-conc'[4] give evidence of the need of this type of search tools. At the EDUG Annual Meeting 2017 the opportunity of a potential collaboration between developers of such tools has emerged.

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3. About Mapping through CCMapper: http://www.uio.no/for-ansatte/enhetssider/ub/prosjekter/mapping-for-sluttbrukertjenester/delte-dokumenter/brosjyre-engelsk-endelig.pdf

4. About coli-conc project: https://coli-conc.gbv.de

When two (or five) become one: devising a reclassification project workflow in a multi-site art and design university

Nicky Ransom, Data Quality Librarian, University for the Creative Arts

This article describes the workflow that has been designed for use in an in-house reclassification project at a multi-site art and design university. The workflow has been devised to be flexible enough to cope with changes in the availability of staff resource while limiting the disruption to users during the process of reclassifying and re-labelling the stock.

Background

Like many arts institutions, the University for the Creative Arts (UCA) has undergone a changing administrative landscape on its journey from art school to university. Through the gradual merging of its constituent institutions, UCA has had to negotiate the coming together of disparate practices in many areas of its service in order to offer a unified experience to students and to realise the potential for efficiencies that this has created. For the library, one of the major areas of negotiation was the merging of the library catalogues so that students across the University could search and request stock from any of the available campus libraries. The next step for the Bibliographic Services team was to tidy up some of the differences in legacy cataloguing practices that were evident in the catalogue records, and agree the cataloguing standards that would be applied from then on. After this, the focus moved to a review of classification practices. Although all campuses used the Dewey Decimal Classification scheme, there had been differences in its application between sites, partly due to differences in which edition of Dewey was in use, but also in how the scheme had been adapted to suit local needs. This had resulted in a fair proportion of stock having different call numbers at each site for the same book. In order to take advantage of full shelf ready supply of new stock and the efficiencies this would bring, it was decided that a standard usage of Dewey would be agreed for all new stock acquisitions, and that a project would be set up to reclassify and re-label all existing stock that didn't reflect this standard usage.
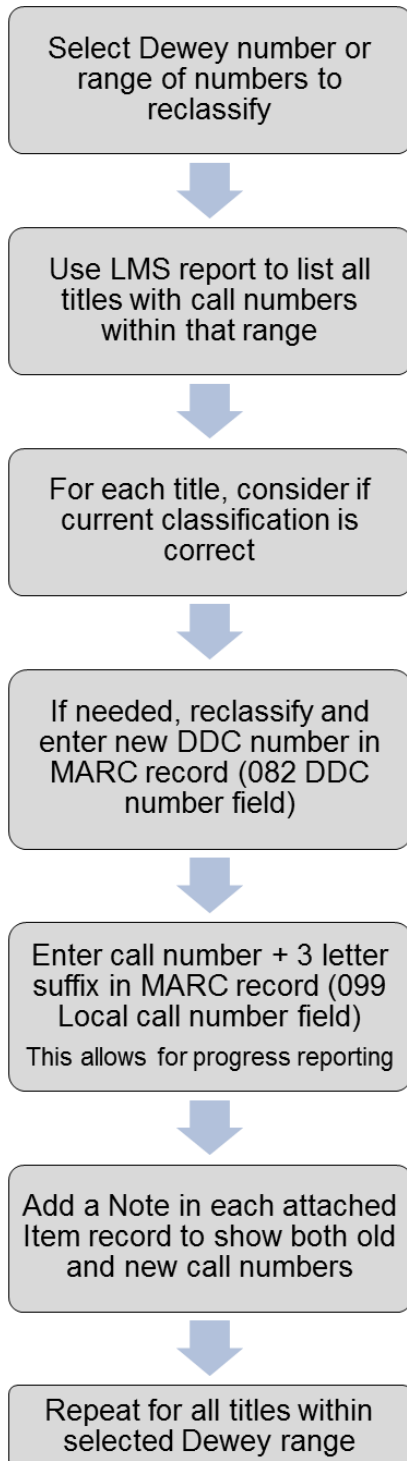
Planning the workflow

Agreeing a standard usage of Dewey and sharing this with our shelf ready supplier was the easy part, in spite of the minor localisations that we still apply to adapt Dewey to the needs of our subject-specialist institution. The harder part has been working out how to review and reclassify our existing stock. We considered several strategies to complete the work, including outsourcing, but in the end, budget constraints meant that it was decided that the work would be carried out in-house and within existing staff resource.

The next step was to devise a workflow that was flexible enough to allow progress to be made on the project as time allowed, but that would also minimise any disruption to our users, one of the most important considerations for us when planning the project. We tested and tweaked the workflow to make sure that we had thought of every eventuality, and we presented it to the teams who would be doing the re-labelling so that they could find out about the project and understand their vital role in making it a success. It also gave them a chance to think through the workflow from their perspective, ask questions, and make suggestions. After this, the workflow was finalised and put into practice.

The resulting workflow is split into two parts which can proceed fairly independently of each other. The first part is the process of deciding on the correct classification for each title in the collection, and the second is the physical re-labelling of stock with the new call number. Figure 1 gives an overview of the process.

Classification workflow
work carried out remotely by cataloguers from LMS reports

Select Dewey number or range of numbers to reclassify

↓

Use LMS report to list all titles with call numbers within that range

↓

For each title, consider if current classification is correct

↓

If needed, reclassify and enter new DDC number in MARC record (082 DDC number field)

↓

Enter call number + 3 letter suffix in MARC record (099 Local call number field)
This allows for progress reporting

↓

Add a Note in each attached Item record to show both old and new call numbers

↓

Repeat for all titles within selected Dewey range

Relabelling workflow
work carried out by library advisors in each campus library

Run LMS report of items ready to be relabelled
ie those that have the Note in the item record

↓

Retrieve books from shelves and relabel with new call number shown on report

↓

Amend LMS to show new call number, and remove Note from Item record
or the item will appear next time the report is run

↓

Place reservation on items currently on loan so that they can be relabelled on return
Another report can be run to locate any that get missed

↓

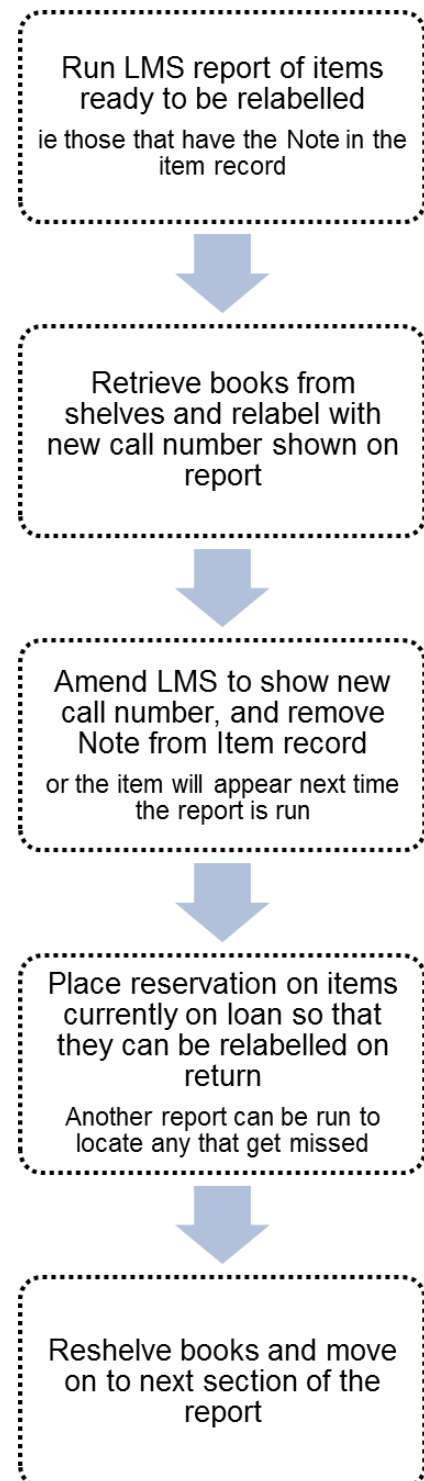Reshelve books and move on to next section of the report

Figure 1. Reclassification workflow

Stage one - classification

The first part, deciding on the correct classification, is carried out by the cataloguing team, who are located at the Farnham campus. Rather than starting at the beginning of Dewey and working logically through the schedules, we have chosen to focus on specific areas of stock in the most urgent need of reclassification, such as areas with localised classification, areas where there have been significant changes to Dewey numbers in recent editions of the scheme (such as the new number for cinematography at 777), or areas of high usage where we are buying a lot of new stock (for example, graphic design and illustration). Once a particular area has been selected, a report is generated from the library management system to list all the books with call numbers that fall within the selected range, detailing the title, current holdings, the Dewey number in the MARC record, and the supplier of the MARC record: if the record bears the code of our shelf-ready supplier, we can ignore that title as it will have already been classified correctly when it was supplied.

Working through the list, we decide on the correct classification and add this information to the record in the library management system. Deciding on the correct classification is mostly done from the reports rather than from looking at the book itself; as we are based centrally and don't have easy access to books at each site, this is the only way that it is feasible to do the work. On occasion, we do request that a book is sent to us to look at in person, but in most cases it is fairly straightforward to get a good enough classification for a book from the MARC record or from looking at, say WorldCat[1] or the OCLC Classify[2] service.

Apart from working out some of the trickier areas of classification, adding the information into the MARC and item records is probably the most time-consuming part of the workflow. As well as changing the Dewey class number field in the MARC record (MARC 020), the new call number is added into each and every item record for each title, so if a title has 20 or 30 copies, the note has to be added 20 or 30 times. The note is written in a particular way (eg "Reclassify 741.6 GRA to 741.605 GRA") as the word "Reclassify" is used further down the process to run reports to alert campus staff of those items that need to be relabelled. The note includes both the old and new call numbers as this is essential in trapping books out on loan during the re-labelling process.

We also add a local call number to the MARC record (MARC 099) which is used to show whether a particular title has been through the reclassification process. This is also used by our acquisitions staff to instruct our supplier if we order extra copies of an existing title, and it is also used to run reports to keep track of our progress.

At this point in the workflow, the actual call number of the book is not changed in the catalogue so, as far as the user is concerned, nothing has changed and they are not affected by the change in classification. The cataloguing team can carry on with classifying records as quickly as they are able as it doesn't matter if the notes sit in the records for a while until the staff in the campuses are ready to pick up the next stage of the workflow.

Stage two - re-labelling

The second part of the process, re-labelling the books, is fairly straightforward. The library advisors at each site print off reports of the books that have been reclassified (ie those that have the word "Reclassify" in the item note field) and then they work through the lists as and when they are ready, only taking off the shelves as many books as they can manage in a session. Once they have applied the new spine label, they update the item call number in the catalogue and remove the reclassify note in the item record, otherwise the item will be included again next time they run the report. If a book is out on loan at the time of reclassification, a reservation is placed on the item so that it can be trapped and re-labelled when it is returned.

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1. https://www.worldcat.org

2. classify.oclc.org/classify2/

By working in this way, we avoid having trolleys of books sitting around in the back rooms waiting to be relabelled and therefore unavailable to users, the catalogue is not out of sync with the actual location of the books, and the library advisors can schedule the work around other duties.

Putting it all together

In practice, the workflow has worked really well and we have only had to make one or two minor adjustments to it as we've gone along. We have also found that we've been able to use the same workflow to add reclassification notes when new copies of existing stock have been ordered, using the call number provided by our shelf-ready supplier to reclassify all other items on that title record, as well as any previous editions. This has been a useful way to continue to make some progress on the project when there hasn't been the capacity to devote much resource to the classification side of the project.

Although one of the benefits of the workflow is that these two processes - classifying and re-labelling - can proceed independently of each other, in reality the re-labelling staff can quite easily keep up with the classification work as there are only two people doing the reclassification and, as this is only as a small part of their workload, they find it difficult to devote as much time to the project as was originally intended. However, the workflow does mean that if any extra resource becomes available to reclassify, it wouldn't be necessary for the library advisors to speed up their side of the process in order to pace, which gives the project a lot of flexibility in its resourcing.

We've still a long way to go with the project, but the process is now well embedded into our way of working and we will continue to make progress as and when we can.

Universal Decimal Classification – adding value to the user experience

Penny Doulgeris, Metadata Librarian, IAEA Library

Introduction

This paper will examine Universal Decimal Classification (UDC) through the lens of the International Atomic Energy Agency (IAEA) special library and discuss the pros and cons of the classification system in the context of serving this library's users. In addition, the paper will highlight a series of actions to be taken to assist library patrons to enhance their user experience through a better understanding of UDC.

IAEA Library

The IAEA was created in 1957 and is located in Vienna, Austria. The organisation promotes the peaceful uses of nuclear science and technology and helps ensure that nuclear materials are not used for military purposes (IAEA, 2017).

The IAEA Library was established in 1958 to serve the staff of the Agency as well as the staff of the Permanent Missions to the IAEA and researchers around the world. The collections of the Library are highly focused and relate directly to the core purpose of the IAEA. From the beginning, the Library has classified parts of its collection using the UDC. Currently, over 70,000 items in the Library's collections are classified using UDC.

Universal Decimal Classification

First developed in the late nineteenth century by Belgians Paul Otlet and Henry LaFontaine, the UDC was conceived to create a list of "everything that had been written since the invention of printing" (McIlwaine, 2007). Otlet and La Fontaine's decision to organise this information systematically led to an agreement to use and modify the Dewey Decimal System (DDC) to meet their requirements (Taylor, 2015).
UDC is currently used in 130 countries in 50 languages (UDC Consortium, 2017). In Europe over 140,000 libraries in 41 countries are using the UDC to classify their collections (UDC Consortium, 2017).

UDC modified and expanded DDC through adding detailed subdivisions and through using typographical symbols such as the colon (":") and the plus ("+") sign to help express "multifaceted subjects with more granularity" (Taylor, 2015).

For instance, in the IAEA Library the following classifications have been used:

621.039.58   Safety considerations for nuclear fission reactors
621.039.58:004.42   Computer programs in relation to safety considerations for nuclear fission reactors
621.039.58(410)   Safety considerations for nuclear fission reactors in the United Kingdom

The differences between UDC and DDC mainly arise from the fact that UDC was developed as a tool for retrieval and not for browsing (Broughton, 2004). UDC was originally designed to organise the catalogue to allow detailed searches rather than to organise order on the shelf which enables browsing (Perreault, 1969) and therefore the classification numbers can be confusing for patrons to navigate.

While the IAEA Library has found the UDC especially suited to its narrowly subject focused and multilingual collections it also considers the UDC as the means to facilitate the "parking" of items on shelves (Glushko, 2013) and therefore the Library is keen to ensure that its users can both search the catalogue and browse resources on the shelves with a better understanding of the classification applied.
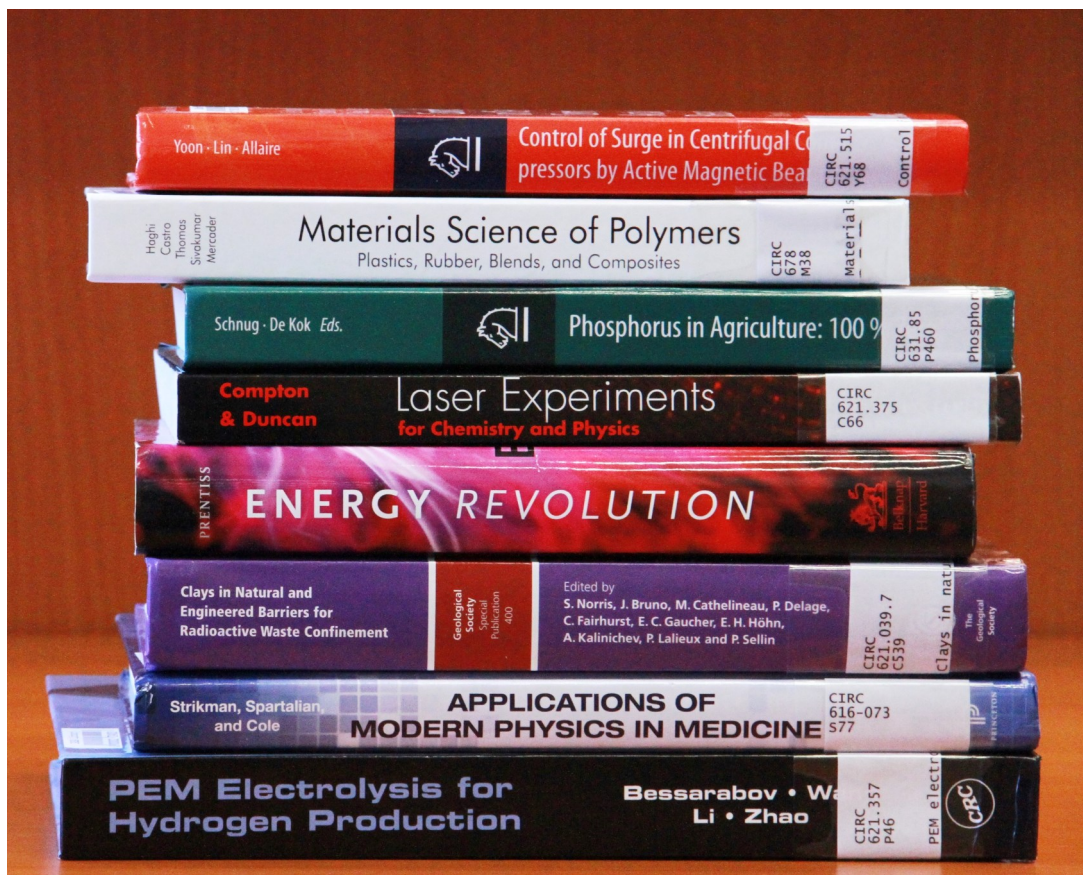
Early assistance for users at IAEA

Initially, when the ratio of Agency to Library staff was high, every new recruit met with a Librarian to discuss their work background and related areas of interest. It was recognised that the card catalogue was difficult to navigate and each new staff member was presented with a "personalized UDC schedule". For each new patron, a card was created that listed their work-related interests as subject headings next to the corresponding UDC number/s. The schedule was printed on a card and inserted into a folder with the instructions that the UDC numbers were a valuable resource in helping users find material to match their subject interests, particularly when browsing the shelves (Kepple, 1967).

Over time, the preparation of the UDC schedule was phased out. This was mainly due to the automation of the card catalogue.

Online Library Catalogues vs the Need to Understand Classification

With the advent of Online Public Access Catalogues (OPACs) the need for users to be able to understand the classification system is not as important. Users can easily search by title, subject, keyword, author, series and call number and once they have their result they are able to "browse shelf" to see what else is in the immediate vicinity of the call number on the item they are looking at. Until the user needs to collect an item they do not have to concern themselves with the UDC number at all. However, both users and library staff face challenges with UDC which the Library has undertaken to address.

User Experience

From a user perspective, the following are issues which affect ease of access to the Library's collections:

- Users do not how to use UDC to find items on the shelves.

- Users who say they will find an item in the stacks themselves often require assistance to locate that item because the filing order of items once notation is included can be difficult to understand.

- Users often ask, "what do the numbers mean?" and in effect what they are asking about was addressed by the original personalized UDC schedules - where they should look for items relating to their subject interests.

- Individual library decisions on how to use UDC can be confusing. For instance, in the IAEA Library, due to the challenges of shelving space, management books are classified in both 005 and 658. While 658 is no longer used, books on topics related to management can still be found in both locations.

Library Staff

From a staff perspective, the challenges of working with UDC include:

- <u>Learning curve</u> - library assistants have to be very well trained to be able to shelve books accurately (the shelving order of the notations and auxiliaries can be difficult to learn). There is a relatively long learning curve for new staff who assist with shelving.

- <u>Time commitment</u> - bibliographic records are downloaded from OCLC. As these records do not generally contain an UDC number, classification is still a very labour intensive exercise.

- <u>Possible classifier bias</u> - classification is done by one staff member. Over time who that person is has changed and therefore so has the approach to classification. While the current classifier will always look at how similar works have been classified in the past, there is not always a similar work to check and there will always be the added element of the classifier's own judgment. This has led to similar items being classified in very different ways over time.

- <u>Availability of tools</u> - While there is UDC online for browsing and building UDC numbers it has been difficult to find a useful tool for checking what UDC numbers other libraries might have allocated to a particular item. Often, the classifier will check a tool like OCLC Classify for the Dewey number generally allocated and then determine how that number translates to UDC. Finally, consideration is given to whether that number is appropriate and meaningful in the context of the IAEA Library's collections.

- <u>System challenges</u> –In 2016 the Library migrated to a new Library Management System. While this system can operate with UDC it is by default set to work with DDC so there have been some issues to resolve in terms of configuration. In addition, at the time of writing, it has not been possible to add a UDC Statistical Category Table (SCAT Table) to the system, meaning certain reports cannot be produced.

The way forward

The IAEA Library will take a multipronged approach to assist users to better access the collections. While there will not be a return to the personalized UDC Schedule, actions will be taken to help make UDC more transparent and relatable for patrons. These measures will also enable the Library's patrons to feel more comfortable in browsing and locating items on the shelves.

Studies on user behaviour indicate that, even when users do not fully understand the classification system, they will "*combine a catalogue search with subject browsing on the shelf*" (Slavic, 2006 (preprint))

With this research in mind, it is envisaged that staff will also make more use of the search facilities in the new catalogue interface – the ability to browse the virtual shelves and search by call number should assist users to take more control of their own research and, in doing so, open further opportunities for them to discover different parts of the Library's collections and resources.

The planned activities include:

- Development of a LibGuide to provide an overview of how UDC is used in the IAEA Library and outlining the content of the main classes. The LibGuide will also include basic information on shelving order of classification numbers including those incorporating notation.

- Better shelf labelling – currently the end of each stack has a notice showing only the UDC range for the items in that stack. The enhanced signs will include both the numerical UDC range and some brief information about the subjects covered by that range.

- Promotional material will include a brief UDC schedule as it has been applied in the IAEA Library – this material will be available to patrons visiting the library as well as being made available at induction and other library training programs.

- Improvement of the Library's procedures and workflows for classification and indexing. This will help to ensure that new library staff coming to the position will be able to understand and follow what has gone before – hence enabling more consistency in classification.

In addition, there will be several reclassification projects which will result in:

- Co-location of items in the same monographic series by assigning one UDC to the series. Currently, the practice is to provide an individual UDC to every item in the series meaning that these items can be far removed from one another on the shelves. Bringing the series together will be useful for both users and Library staff when assisting users or when shelving items.

- Co-location of books on the same subject which have been separated via a change in classification policy. For instance, books on management techniques are currently classified in both 005 and 658, and books on computer software can be found in both 004 and 681.

Conclusion

As Ranganathan's fourth law of library science states – "*save the time of the reader*" (Ranganathan, 1931). While this can be done in a number of ways, ensuring that library patrons can understand and make use of the classification system are important steps for libraries to ensure they comply with this 'law'.

UDC is a widely used classification system which remains relevant to the collections of the IAEA Library. There are several actions which the Library needs to take to ensure that users can better understand the meaning behind the numbers. These steps, as outlined in this paper, will enhance user experience in the Library and help to ensure that patrons feel confident to find, search and access the collections on their own.

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From Byzantine Art to Winnie-the-Pooh: classifying a private library

Mary Mitchell, Courtauld Institute of Art

I recently had the opportunity to do something unusual: create an entirely new classification scheme for a library which had not previously been catalogued or classified.

The library in question is the personal property of a private individual. It consists of several thousand volumes, most of which reflect the owner's interest in art. They include monographs about art, exhibition catalogues, auction catalogues, dealers' catalogues, museum collection catalogues, private collection catalogues, and a few other miscellaneous items. The client wanted the books catalogued as a way of keeping track of what he did and did not have in order to avoid acquiring duplicates, and because he wanted the ability to search his library for books on a specific subject – Byzantine icons, or Medieval enamels, for example.

I have been cataloguing for a number of years, mostly in art libraries, so when I was approached about this job I felt quite comfortable with the cataloguing and with the materials. However, I had no idea what the client might want in terms of classification. I didn't know at first whether he would even want the books to be classified at all, or perhaps might just want me to give them a shelf number to indicate their physical location, with new acquisitions added to the end of the sequence. By the end of our first conversation, however, it was obvious that he definitely wanted the books arranged on the shelves by subject, which of course requires them to be classified.

The next question was, obviously: which classification scheme to use? I considered using either Dewey Decimal Classification or Library of Congress Classification, but decided against them. They both seemed too big and too general for this small and very specialised collection. More importantly, they can be complex to use. I knew that my time in this library would be temporary. After my departure, any scheme adopted would need to be usable by someone else, who would not be a librarian and therefore probably not accustomed to navigating through classification schemes. To expect someone with no training and no experience of classifying to happily tackle the complexities of a large scheme such as LCC would be unrealistic. If I wanted the scheme to continue to be used – and useful – after I left, it was vital that it be user-friendly. I needed to ensure that neither the structure nor the notation were over-complicated.

The owner had already instinctively arranged the books in general subject groupings. All books on Medieval art were grouped together, and subdivided roughly by art form. This was the largest section of the library. Byzantine art, African art, Asian art, and American art formed smaller sections. Auction catalogues were shelved together, as were private collection catalogues and most of the museum collection catalogues. The owner told me there were three things he considered important in arranging his books: time period, place, and art form. Without realizing it, he was talking about facets. This turned my thoughts towards a faceted classification scheme such as Universal Decimal Classification. I decided against using UDC, for essentially the same reasons I had decided against LCC; but I did feel inspired to consider a UDC-style approach in which each of the three facets the client had identified would be represented by a number, with the three numbers separated by a punctuation mark.

This idea appealed greatly because it could reflect all three of the facets, and still be relatively easy to use. Unfortunately, a problem became apparent when I started to consider citation order. Unlike some classification schemes, this one was not intended as an attempt to organize all human knowledge, or to serve all possible types of users.   It is a practical tool to meet the needs and requirements of one specific individual user. Under the circumstances, that one individual's wishes are important. Taking into account the client's preferences and the existing shelf arrangement, when I considered citation order it seemed most sensible to prioritise place.

However, this would have put, for example, French Medieval manuscript illumination and French Impressionist painting near each other because both are French. Prioritising art form would have disturbed the existing shelf arrangement by putting ancient Egyptian sculpture near Medieval European sculpture. Either of these approaches would have resulted in an unhappy client. He preferred a shelf arrangement in which all things Medieval, regardless of art form, were kept together, and in which European, African, Asian, and American art each formed their own distinct sections. Even prioritising time period would separate many of the books on Africa, Asian, and American art and mix them up with each other and with the books on European art, rather than keeping them together as the owner wished. The same would be true of an enumerative classification with main classes of place or art form.

To provide a sensible structure for the collection, while accommodating the client's wishes, I was going to have to come up with something a bit unconventional.

The solution eventually adopted is a structure in which European, African, Asian, and American art each have their own section, within which books can be arranged by time period and art form. According to the client's wishes, Byzantine art also has its own section. This seems reasonable, considering the Byzantine empire's unusual position overlapping Europe and Asia, and its unique art and history. The Byzantine section is the most rapidly growing part of the library. The owner has recently acquired many new books on the subject.

The European art section is still the largest section of the library, therefore I made that section of the classification scheme slightly more detailed than the other sections. It is subdivided by time period – ancient, Medieval, Renaissance, etc. Each of the subdivisions starts with a round number – 3000 for ancient, 5000 for Medieval, 7000 for Renaissance, etc. In order to specify art forms or more precise locations, I created two tables, one for geographic places and one for art forms.

In the table of places, I tried to ensure that I covered all reasonable possibilities. Using a combination of atlases and the Getty Thesaurus of Geographic Names, I tried to list all countries. Because some of the books in the collection discuss general regions (northern Europe, or west Africa, or the Pacific islands, for example) rather than specific countries, I built numbers for these regions into the table as well. The Thesaurus of Geographic names again provided some very useful help with this. I followed its guidance on questions such as which countries to consider north African, or east African, or west African, etc. I did not create numbers for individual cities. In a collection like this one, which is small but very wide-ranging in its geographic coverage, the large amount of work involved in trying to identify and number all the cities and towns that might be relevant would have been disproportionate to any benefit that might have resulted.

As an example of how the scheme works, the class number for a general book on Medieval European art would be 5000. To classify something more specific, such as a book on Medieval French painting, the tables are used. In the table of art forms, painting is 200. For Medieval painting, the two numbers are added together to get 5200. If necessary, specific places can be indicated by adding a decimal point followed by the appropriate number from the geographic table. France is 90, so Medieval French painting would be 5200.90. Similarly, Renaissance French painting would be 7200.90 and eighteenth-century French painting would be 11200.90. The numbers are, I hope, easy to recognise and understand because anything with a 200 will always indicate painting, and anything with a decimal point followed by 90 will always indicate France. Similarly, anything between 5000 and 6000 will always indicate Medieval and any number between 7000 and 8000 will always indicate Renaissance. Just as 5200 is Medieval painting, 7200 is Renaissance painting. Other art forms follow the same pattern. 5010, for example, is Medieval sculpture; 7010 is Renaissance sculpture. 5300 is Medieval books and manuscripts; 7300 is Renaissance books and manuscripts. This structure keeps all Medieval art and all Renaissance art together, as the client wished, while still making it possible to indicate various art forms.

The sections for Africa, Asia, and the Americas are structured very similarly, except that I did not use the terms Medieval and Renaissance in those sections, because they are specific to European history and not as relevant to the other parts of the world.

I did use the term Medieval in the Byzantine section however, because it is used in the literature on the subject, and does have relevance.

Of course, not quite everything in the collection fit into this part of the classification. The most obvious exceptions were the auction catalogues, dealer's catalogues, museum catalogues, and private collection catalogues. The auction catalogues were the easiest to deal with. I added a class number for auction catalogues, and arranged them by the name of the auction house. I did something similar with the dealer's catalogues, but with one exception. The owner preferred to have dealer's catalogues of the work of one individual artist classified with that artist, rather than with other dealer's catalogues.

I added another class number for museum catalogues, which I used for guidebooks to museums and general catalogues of museum collections. Catalogues of specific parts of museum collections were classed with the subject if possible. For example, a catalogue of Byzantine art in the Hermitage Museum was classed with Byzantine art, but a general guidebook to the Fitzwilliam Museum was classed with museum catalogues. I dealt with the private collection catalogues in a very similar way.

The collection includes a small number of items which are not related to art at all. One of the great joys of this work was unexpectedly coming across everything from car catalogues to some previously-classified documents about the D-Day invasion of Normandy, or treasures such as some beautiful books from William Morris's Kelmscott Press, or a lovely first edition of Winnie-the-Pooh. I added a class number for literature, to accommodate things like the William Morris books and Winnie-the-Pooh. Finally, I had to decide what to do with the car catalogues and a few other random items. Since I could not, within the context of this small classification scheme for this small collection, attempt to represent every imaginable subject, I added a class number for miscellanea. This worked very well as a home for the few odd things that didn't fit elsewhere in the scheme.

I do not yet know what will happen in the future with this scheme. One of the advantages of its simplicity is that it should not need a great deal of updating, though I was careful to leave some space in each section where more numbers could be added in if necessary. Perhaps the client will call me back occasionally to catalogue and classify new items, or perhaps he will prefer to hand that work over to his assistant. I tried to make the scheme user-friendly enough that it could easily be taken over by someone else if that is what the client chooses. Either way, my main hope is that it will still be used to classify new additions to his collection. If it continues to be useful, I will consider it a success.

Tales from the Garside: classification at the University of Leeds

David Harwood & Alison Hazelaar, Metadata Specialists, University of Leeds

As metadata specialists working with an in-house classification scheme we would like to share our experiences of working with a unique scheme. With just less than 32,000 students, and being the seventh largest university in the United Kingdom, we have a broad range of subject and research areas to cater for. Local classification schemes are usually found in smaller specialist libraries and it is quite unusual for an academic institution of the University of Leeds' size to have adopted such a scheme. The implications of inheriting an in-house classification scheme are significant for both the classifier and the end user. Before we address these implications it is first of all necessary to provide some background to our scheme and its context within the University of Leeds libraries.

History

The University of Leeds uses four main classification schemes, although our in-house "Leeds scheme" is used for the vast majority of our book stock. National Library of Medicine Classification is used in our Health Sciences Library, Library of Congress is used for Psychology and Dewey Decimal Classification (DDC) is used for Education.

Before the Brotherton Library was built in 1936, all of the library's collection was scattered in subject departments around campus. Books were simply given the name of the subject library as location and with no subdivisions e.g. "French" or "Botany". The main classification scheme within the University of Leeds libraries is unique to the University and has been developed in accordance with the development of the University over the years. Many libraries adopt 'localised' or 'specialised' classification schemes with the intention of providing the user with a more in-depth and comprehensive breakdown of subject knowledge. The classification scheme used at the University of Leeds in most part developed this way, with small localised schemes being developed to accommodate the stock of departmental libraries that once housed a significant proportion of the University's bibliographic material.

With a new university library on campus, and a newly appointed Assistant Librarian in Kenneth Garside, the Leeds classification scheme was brought together and developed further by the adding of notation to the original subjects. For example, the classmark Sociology F-5.3 BAR would thus be a book on divorce and family break-up in the Sociology schedule with an author named Barnes. Over the years the need for self-contained departments housing research resources diminished and there was a gradual move towards a more united front or gathering together of services. As a result, these small individual libraries have been amalgamated into four main sites, the Brotherton, Edward Boyle, Health Sciences and Laidlaw libraries housing approximately 2 million books.

Until the end of the 1990s subject librarians were responsible for updating the scheme and had responsibility for all classification. In theory this worked well as they had an in-depth knowledge of their subject areas and were ordering books and liaising with academics. However, on the downside, these individual subject classification schedules had the potential to turn into mini schemata of their own. Books were being squeezed into one schedule which would have been better classified in another. Dare we say, that some subject schedules were guarded territorially? One prime example is Criminology, which exists in an almost identical format in both the Sociology and Law schedules.

During this period, no systematic programme of updating and revising the schemes was apparent. Changes and additions to some individual schemes (to accommodate new subjects and disciplines and relieve congestion) were only carried out sporadically and as and when it was deemed necessary.

When all classification and cataloguing was merged together into a centralised Metadata Team, the chance finally arose to look at the classification scheme as a whole and to introduce a programme of continuous review and development.

Implications

Having worked with both the in-house University of Leeds scheme and a faceted scheme like DDC, we feel we are well placed to ponder the advantages and disadvantages of localised classification and share our experiences of some obstacles we have faced.

One would not dispute that the adoption of a scheme like DDC from the library's inception would have been a simpler and more pragmatic road to follow (simply because it is updated without the input and intervention of the classifier) for a large academic institution like ourselves. However, the cost and practical implications of rectifying such a decision would be vast and this has led us to embrace the scheme we have inherited. The freedom and sense of control we have over our scheme can prove at times to be both satisfying as well as daunting and there are distinct advantages and disadvantages of being in such a commanding position.

Taking the positives into consideration, we believe our classification scheme is more user friendly for the customer. For instance, the fact that specific subject areas (as opposed to sometimes overly long DDC numbers) appear on the spine of the book is less daunting for the end user. From a classification perspective, it eradicates the construction of complex subdivisions and allows the classifier to be more creative. Also, the power to amend and create new classmarks free from the constraints of a governing body allows for the greater freedom to address new areas of study and advances in technology, and express the University's areas of study and expertise. Classmarks can be as detailed as we desire and the freedom to create can prove particularly useful when addressing the growing trend of interdisciplinary texts. Although this can be advantageous, with greater freedom comes increased responsibility. Maintenance and revision need to be addressed regularly to conserve an effective scheme, and some of the ways we have tried to address this will be dealt with in due course.

From a negative perspective it is fair to say that if the University of Leeds scheme was being designed today the approach would be significantly different. The scheme suffers from design issues stemming back to its inception, and the unregulated way it has developed over the years. The fact that it has been designed and managed by different members of staff with varying degrees of subject knowledge has led to a lack of uniformity throughout the scheme, with some subject areas being more developed than others. This can be illustrated by some subject areas lacking detail thus resulting in vast and congested classmarks such as 'Law B-3.6' (European Union law), 'Art R-0' (Photography) and 'Sociology F-14' (Culture) that are well in excess of one thousand items. This lack of detail is particularly un-useful to the customer in that similar texts may be shelved apart. Equally, this proves very unsatisfactory for the classifier and there has been a tendency to avoid overly used classmarks wherever possible so that the problem of overcrowding is not compounded. A recent example of such a dilemma was presented when classifying '*Food on the Page: Cookbooks and American Culture*' by Megan J. Elias (2017). Sociology F-14 (Culture) includes the scope note '*including postmodernism, fashion, food'* and on the surface seems like an ideal classmark for such a text. However, the sheer vastness of this classmark combined by the lack of geographical subdivisions led to the text being placed in 'Modern History U-0.06' (United States – Social History) to accommodate both the historical and geographical elements.

Over-indulgent and excessive detail in some areas can be equally frustrating and sometimes amusing to a new cataloguer. For example, within Zoology B – "Studies of Taxonomic Groups" there are extremely detailed and long pages of subdivisions for protozoa, molluscs, insects, fish and birds and yet when you arrive at mammals there are just 20 possible classmarks, three of which are Carnivora (cats, badgers, bears, dogs), Primates and Man.

Several areas within the English classification scheme have also made the classification process overly complex and throughout the years this has led to many classmarks being used infrequently. These problems were compounded by lack of maintenance and revision and many schemes had become unevenly balanced. Ferrari (1999) highlights the necessary maintenance and revision of localised classification schemes, and if this is not applied strictly a scheme is liable to become unruly. This has certainly been the case with the University of Leeds scheme in the past. The uneven treatment of subject areas has led to some classmarks being too detailed and barely used, and others significantly lacking detail, resulting in hugely congested classmarks. Lack of detail has added to this congestion through best fit classmarks having to be used regularly. This lack of detail, combined with insufficient updates, also led to the problem of the scheme often being unable to accommodate new stock/subject areas, once again fuelling the use of best fit classmarks and classmark congestion. With regard to the inconsistent design of the scheme, it can be noted that the uneven application of geographical subdivisions, and the duplication of subject areas has proved problematic for both the classifier and user.

As the University of Leeds scheme was designed to suit a set of small departmental libraries that were often used in isolation from one another, the issue of classmark duplication has also become a significant problem over the years. When the University's collections were brought together and housed within fewer central library sites, it was not unusual for similar subject areas to be located in different areas of the scheme. For example, there is a crossover of 'Criminology' within 'Sociology' and Law' and 'Biography' within 'Politics' and 'Modern History'. This problem was exacerbated in the past through departmental politics and collection funding, and it appears that there was a reluctance to address it. As a consequence, at times this made the classification process significantly more complex, and hindered browsing of our collections from a user's perspective.

When combined, this set of inter-related problems, -generated by the inconsistent design, and the sporadic and sparse attention to updating and revision- has counteracted the fundamental aim of localised classification in that it is able to offer a more detailed and comprehensive means of classification than their generalised counterparts (MacDonald, 1991, p.95).

Moving Forward

Following the handover of classification responsibility from subject librarians to a centralised 'Metadata Team' with metadata specialists classifying across the whole range of subjects, the problems of the scheme began to become more apparent. Following the outcomes of a library 'Lean' project in 2013, a classification review group was established to address classification problems and inconsistencies, and improve the classification experience of both the classifier and the end user.

During the process of a series of ongoing weekly meetings, classification schemes have been systematically reviewed and revised to eradicate rogue classmarks (where mistakes have been made or new unofficial classmarks have been developed without notation on the schedule master copy), inconsistencies of notation and adding scope notes to the schedules to aid the classifier. Cross referencing has been carried out to highlight similar classmarks throughout the scheme as a whole, and in some instances classmarks have been closed and reclassified where duplication was deemed a significant problem.

The introduction of new subject areas has also taken place to accommodate new historical periods, new advances in technology, topical themes such as 'Brexit' and 'Terrorism', and new areas of study within the University. It is our aim in the future to develop further relationships with the ordering team and their selection of reading list material to identify and anticipate new topics of study before the monographs are ordered and received.

Attempts have been made to make our schedules more consistent and linear in terms of terminology and numbering, although the latter has proved more difficult due to inconsistencies of the initial design of the schemes. Despite this, we feel that improvements have been made in this area.

With regard to the issue of classmark congestion, the problem areas have been identified and in some cases dealt with through further subdivisions and reclassification. Classmarks of over one thousand items have been identified, but it has to be noted that these are proving more challenging as it would take significant time and budgetary resources to subdivide and reclassify these areas effectively. Progress is being made on tackling these vast classmarks but is inevitably slow.

On the whole we are pleased with our progress and have made improvements that we feel are both beneficial to the classifier and the end user. We recognise our scheme still has its flaws. Time and effort are required to maintain it, and keep it up-to-date and comprehensive, but the freedoms that accompany these efforts also prove beneficial. One cannot ignore the fact that a general classification scheme, encompassing all knowledge, such as DCC, would be more suitable to a collection of our size, although localised classification (perhaps on a smaller scale) is not without its merits. We share Ferrari's (1999) view that constant revision of localised schemes have to be strictly adhered to in order to prevent further generation of problems for both the classifier and the customer. To that end the classification review group will continue to meet, and will aim to anticipate and prevent future problems.

If Kenneth Garside had remained at Leeds University beyond 1945 we would like to think he would have implemented such a systematic review of his scheme. Since this responsibility has now fallen to us, our job now is to nurture and develop Garside's legacy in order to provide a scheme that is both comprehensive, contemporary and fit for the interdisciplinary library user of the 21st century.

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Library of Congress literary author numbers: and what to do about them when they're not there

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Summary

This article describes the evolution of the current approach to dealing with (predominantly) literary authors without an individual number assignation at the University of Liverpool Library, which evolved from leaving cutters blank for a future revision that never came, to a more practical and successful practice of attributing local cutters on a locally determined basis, applied during a few reclassification projects and now embedded in current practice.

Introduction - 3 important facts about LCC

1. The Library of Congress is one of the most popular classification systems after Dewey.
2. The Library of Congress system is constructed primarily for the Library of Congress by the Library of Congress.
3. If something is not covered by the Library of Congress Classification system for a library outside of the Library of Congress, you're pretty much on your own….

At least that's the way it seemed in 2005.

Background

The Library of Congress is the main classification system in the Library I've worked at for the last 14 years. It's fairly comprehensive, but clearly American centric, and is not the most adaptable system. As a result, we already had a number of local practices.

1) We did not use LCC cutters on a general basis. Instead, we used locally produced two number derivatives from the three number Cutter Sanborn tables for cutters in general, preferring authors to titles, and we didn't add the date (later we added edition numbers where relevant).

2) We used local tables for a large portion of country cutters, and added in entries for any subjects we were inclined to add in the relevant "subject A-Z" class areas.

3) We used a simplified, generalised, expansion table for single number literary authors.

4) Some areas remained in previous sections when LoC would revise a topic and move to a wholly new area. We didn't particularly make an effort to follow updates or revisions of sections. Although we had a number of local practices, we nonetheless used standard Library of Congress numbers for literary author cutters (and the majority of other numbers for persons as subjects, or where the main focus of each areas was to be focussed), and consequently had the problem other libraries must surely run into where LoC have not assigned particular numbers:

So, the question arose, what do you do when LoC have not classified an individual number for a literary author?

The general practice was to leave the number empty, with the expectation being that when time became available for projects, or when it was noticed that a number had been assigned by Library of Congress, the records would be updated and the class number added in on the book.

However, on enquiry it was obvious that this never occurred, so actually what we actually ended up with was a steadily increasing number of books at the beginning of each letter section with a random number of books by authors with numberless cutters starting with the same letters completely out of sequence.

Obviously, this was contrary to the whole plan of the classification, so at some point I suggested we should just add them in.

The first attempt at a solution

We checked out the online instructions about how to add numbers not found on Library of Congress, and were faintly baffled as to how it worked. I believe we tried to construct a few numbers, found they were out of sequence, and gave up.

The second attempt at a solution

We had a local rule that in absence of a Library of Congress number, we would use a number assigned by another library, assuming it fit into the sequence. Melvyl (the University of California catalogue) and Eureka (the union catalogue for the US RLG, now a subcollection of Worldcat) were favoured as sources of these numbers. However, in practice I found that the Melvyl class numbers also did not necessarily place authors in the correct alphabetical order as maintained by Library of Congress, and so I raised it during our Rule Interpretation Meetings, with the result that we decided to revisit the creation rules. The issue was primarily investigated by myself and long term local cataloguing guru Ken Linkman, and between us we found the explanation for the disparity by rereading the instructions more carefully. The explanation became quite clear in the initial paragraph (this is from the current version, so wording may be paraphrase of original):

> **Note: The final Cutter number is based on entries already found in the shelflist** (and in some cases entries reserved for other libraries for which LC does not have an item in its catalog).
> The letters in the table represent the letter that follows the initial letter of the author's surname (vowel, consonant, etc.). The number is that which should be used; however, **it may be necessary to add other numbers or to use judgement to allow for growth when providing numbers for extremely common names.**

This, as far as we could tell, was an understatement! We found very little example by which where the cutter creation tables seemed to have much value in terms of creating a number which actually matched the original Library of Congress numbers, with the result that we decided that we'd apply our own policy, which may well match what I suspect is actually the policy at Library of Congress.

Rather than use the rather counter intuitive and relatively complicated instructions as suggested, we would use our own slightly more user friendly tables, but if this put the number outside of the established range, we would just make a number up.

Broadly speaking, in cases where there was conflict between the 2 number cutters and LoC, the plan would be to look on either side of the numbers assigned by Library of Congress, and put the number for the new person approximately half way between which persons were already represented on the catalogue. So we didn't have a formula for creating at all – it was purely a practice of inserting. The caveat for creating according to judgement was retained however. So, the new rules were summarised in a set of instructions written by Ken:

ASSIGNING 'LIVERPOOL' CUTTER NUMBERS
In order to improve shelf arrangement, a number derived from our own Cutter tables will be used whenever an L of C (etc.) one is unavailable.

In most cases this will be a straightforward process. For example:
Spotsholas na ndaoine / by Muiris O'Bric will be classified at **PB1399.O11.S76**

PRESERVING ALPHABETICAL ARRANGEMENT
However, care must be taken to ensure that the use of a 'Liverpool' Cutter number does not upset the alphabetical sequence. This is likely to happen in parts of the schedules where 'official' L of C Cutter numbers have already been assigned to names with similar spellings to the one for which the 'Liverpool' Cutter tables are being used.

For example:
DA591.W5   Wilson, Harold (L of C Cutter number)
DA591.W58   Whitelaw, William   (Liverpool Cutter number)

In order to preserve the alphabetical sequence, a number will have to be chosen, at the cataloguer's discretion, which preserves the alphabetical arrangement. In the case of the above example, **W48** has, in practice, been selected to represent William Whitelaw.

This may result in, for example, the established Liverpool-assigned Cutter number for William Whitelaw, being used subsequently by L of C for another person!

Hopefully, these instances will be rare and would have to be resolved by the cataloguing team as and when they arise.

This practice was instigated in March 2005, and continues to be the general rule. A couple of months later, after further investigation of numbers assigned at other institutions, I compiled a preference table for which numbers were to be used, and when to assign our own.

List of preferences for Cutter number determination

Library of Congress schedules (books or Classweb)*
University of Liverpool Catalogue*
Library of Congress catalogue
Melvyl, Eureka catalogues
University of Liverpool local Cutter tables
Make up a number!

*these are the only sources which should be seen as AUTHORITIVE – all others should only be used if the numbers put the item into the correct place in the alphabetical sequence.

We continued using this practice during our normal classification practices for the rest of the year, but none of this solved the issue of what to do with the pre-existing problem.

The first great reclassification project – (2006)

We had no provision to allocate staff time to retrospective projects, but we did have the possibility of accepting placements from library school, and giving them projects. So I decided to offer a placement to attempt to rectify the problem we had with having a large number of remaining items with numberless cutters.

The remit was initially to focus on the task of tidying up name authorities to local standards for batches of e-resources. In practice, the placement actually revolved around the numberless cutter issue only! The proposal was summarised as follows:

> **Doing retrospective classifying of literary material**
>
> This refers to insertion of cutter numbers for authors who didn't have an official number available from the Library of Congress.
>
> We use a localised variant of LCC at the university, and have changed our practice to allow us to insert authors in a straightforward alphabetical order where such has previously been unavailable.
>
> This will involve cross-referencing of databases to coordinate a non-standard sequence that will work in a coherent fashion whilst accommodating a 'standard' sequence as far as possible.

The plan was to focus on the English Literature section. This section was one of the most important sections to feature a number of items with numberless cutters, and to also be of quite high importance. In some ways it may be surprising that this might be the case, considering English Literature being one of the literatures most likely to be well covered by Library of Congress as a result of shared language, however, considering the likelihood of the University of Liverpool (being a Research University) having large numbers of obscure literary authors and the US centric nature of LoC it becomes less surprising.

The successful candidate quickly gained an understanding of the general issue, but now that whole sections of the library were being considered, it was obvious that trying to insert cutters from our own (2 number, Cutter Sanborn derived) cutter tables was broadly speaking as ineffective as trying to use the table from Library of Congress, and over the course of the project it was decided to *ignore the cutter tables altogether, and simply insert the book in the relevant area "using cataloguer judgement"*.

The approach was a fairly simple one, in that the placement student would go to the PR shelves and simply collect all sections of numberless cutters. He'd put a "*section being reclassified*" sign there if the section was significantly large enough. As far as I can remember, the whole PR section was gone through, and probably little else, because there were such a number of items with unassigned authors.

User response was, as far as I can remember, non-existent, so you could argue it was an unnecessary task which no-one would significantly benefit from. Having studied literature at the University, I do remember appreciating the largely alphabetical order of the section, getting irritated where this wasn't the practice but also unlikely to complain, so I do hope others would feel the same way! (Or hopefully not, having the benefit of more effectively alphabetical sections).

The second great reclassification project (2010-11)

Having been pleased with this initial project, I went on to supervise another member of staff in the same way, who was relocated from shelving duties as a result of an injury. Having completed the literature section and being unsure of which other sections most required attention, I decided to run a list on our LMS (Innovatives Millennium).

I performed a simple search to find all class numbers with a space before the decimal point (e.g. to find based on the "O ." in "PR6037.O .M46 "). The only time we would have this would be in those cases where we had numberless cutters, a practice which enabled all numberless cutters to be determined very quickly.

This led to considerable progress across the language and literature sections, particularly in the early PRs (presumably I'd limited the original project to the later areas of the section to concentrate on the purely author based sections), and PQs (Spanish and French). Architecture also featured quite heavily, if I remember rightly. Selection was simply an issue of toggling the display of the created list (in Global update) to display class number order and picking sections with particularly large numbers of records.

And after this second great reclassification, that, essentially was that! Project work moved on, bibliographically to name authority tidying for large scale e-resource batches, and hence elsewhere. The practice of making up our own cutters in the absence of official LCC numbers remains, however, and, considering that I've never had a complaint about the resulting numbers causing confusion in the sequence of officially derived numbers, I believe it has been, and continues to be, a resounding success!

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Thanks to Ken Linkman for his efforts to remember the original project and permission to quote the original documentation

Cyber-serendipity: imagining the augmented library environment

Edmund Wilkinson, Librarian, UCM

Introduction

Augmented Reality and its associated fields have undergone considerable expansion in recent years, although the ideas involved in them are not necessarily new. The heritage field has been a major driver of augmenting realities, powered by the heritage lottery fund. Heritage curators are increasingly considering how to make use of the next generation of augmented reality devices to enhance the user experience. Most UK libraries however have yet to consider the potential of using similar technology to augment the library and expand the user experience within it. I believe that Augmented Reality should be of great interest to forward thinking libraries and of particular interest to cataloguers.

So, what is Augmented Reality?

The terms are in flux; but ultimately Augmented Reality (AR) offers an alternative to Virtual Reality (VR). VR systems immerse the user in an entirely computer-simulated environment, with various degrees of sophistication. An augmented reality instead adds detail to the users interactions in an existing "real world" environment. Physical space thus remains the core environment in AR. Information and graphics are superimposed onto our perceptions of the real world and this differentiates AR from mediated reality (MR). In MR real world objects are removed from the observers perception to be replaced with computer generated artefacts. Some researchers consider MR a subset of AR (Azuma et al, 2001; Bimber & Raskar, 2006).
It is increasingly common in the heritage field to move the conversation on from AR to Hybrid (or mixed) Reality (HR). HR emphasises an increased degree of interaction with the digital component compared to more primitive forms of AR, which will often simply incorporate embedded video material. This article considers HR to be the logical continuation of AR rather than a separate entity, but the ideas within it should inform the vision of what libraries can choose to become.

The proper role of AR is to add virtual informational material to our perceptions rather than to replace certain aspects, Three primary criteria have been posited within an AR system (Azuma et al 2001), and have become the standard, these are:

- The system 'combines real and virtual objects in a real-world environment'.
- The system '...(aligns) real and virtual objects with each other'.
- The system should run 'interactively and in real time'.

In the ideal form the results are interacted with via an eye-piece; either glasses or a visor, through which the real world is perceived whilst the augmented information is simultaneously over-layed. This form of interaction currently remains beyond the majority of the population. Googleglass failed to take off a couple of years ago; although that hasn't stopped technology firms continuing with substantial investment in the field (Molla, 2017).

Currently the best available interactive device is the smart-phone; probably the dominant tool in merging personal computing and communication. Smartphone applications commonly form the basis of the interactions of the informational society (Sarfwa & Soomro, 2013). Mobile platforms have been increasingly taken into account in envisioning the future of the catalogue (Chambers, 2013), naturally information literacy and induction sessions must place greater emphasis on drawing the users attention toward AR interactions.

AR and the Library

Augmented Reality is already upon us. It has seen early use in public libraries in the UK during the 2014 Summer Reading Challenge with the Mythical Maze app (McGettigan 2014); in addition its impact on the area of Special Collections is being considered (Cullingford, 2016). AR is increasingly used in educational environments (teachthought.com, 2017) and in Europe and the US consideration is being given to the field, particularly from epistemological and pedagogical perspectives (Ariso, 2017; Wildermann 2014). Already publishers are bringing out AR books (https://appreal-vr.com/blog/10-best-augmented-reality-books/) and some thought should be given to how cataloguers will recognise and describe such material; particularly when specific apps are a prerequisite for their use.

However libraries should not only hold AR material; they should actively participate in the development of the Augmented Reality Library (AR-Library) and in doing so the cataloguer has a crucial part to play.

The heart of the traditional library is physicality, but much of the current emphasis in terms of access is based around digital library interactions, primarily through the catalogue. Such approaches form the basis of many components of information literacy teaching, because of the resulting disconnect of the user from physical holdings. Too often I have heard the argument that "*it doesn't matter where a book is put as long as you can find it on the catalogue*"; but classification and cataloguing are both undertaken to render connections meaningful to the user, to provide access-points and to create a sense of underlying order amongst holdings.

The advantage of the catalogue is that it provides access to digital only material, and allows users to describe particular search connections beyond those espoused by the classification scheme alone. Explicating how to undertake this process forms the basis of information literacy provision and also takes up a surprising proportion of library assistants' time. Having served as a library assistant in both public and academic libraries I was intrigued both by the similarities and differences in users interactions with the catalogue. Many users would utilise OPAC terminals to undertake basic searches, but rarely more complex ones. In addition a particular approach by students would be to find a promising item on the catalogue, then take out their phone and take a photograph of the screen to help remember the shelf-mark. They would then go to the shelf, find the book, peruse others in the area (often finding several more items) and return to the OPAC to continue their search. Many expressed surprise they could access the catalogue in other ways, and especially that they might do it on their phone! In effect the OPAC served as a non-portable subject guide and as a hindrance to accessing e-resources, which students tended to locate in alternative ways, because the OPAC is commonly logged in guest mode, problematizing the act of downloading e-resources "mid-search". The catalogue therefore is best used for the location of a specific piece of information, such a shelf-mark or a precisely targeted item or article.

The alternative, a serendipitous approach of shelf-browsing via the classification scheme is still an important access point to the holdings; often regarded as a key approach by humanities scholars. As a process it helps users find material they would not otherwise search for on the catalogue, and contributes to expanding the students understanding of broader themes in their subject through experiential interaction with the collection. The process has no chance of introducing the student to e-resources and can incorporate substantial inefficiencies of time, although the potential pay-off in creating new knowledge and understanding should not be understated. The classification scheme thereby supports the user in internalising a broader level of knowledge, widening a search and considering connections in the creation of new knowledge.

In the AR-Library these distinctions between catalogue and classification can be harmonised and the two aspects synchronised. AR-Library brings the catalogue to the shelves creating a liminal space where knowledge location and knowledge creation are increasingly merged, and facets collected and combined by the user.

AR-Library and the cataloguer:

AR-Library aligns virtual objects to the physical components of the library. These physical components primarily consist of the shelves and the physical stock. Interaction with these virtual objects will then occur in situ through a display device, allowing the user to perceive the various digital layers simultaneously superimposed on the physical reality by leveraging the classification scheme and subject-headings. This will allow the integration of e-resources (such as those held in institutional repositories) and backroom materials into the serendipitous experience of shelf browsing. Although some consideration must be given to copyright issues in deciding the degree to which materials can be made accessible, the catalogue aspect of AR-Library may well circumvent many of these issues.

Alongside e-resources the user is connected with a range of metadata, supporting the users information literacy. Controlled vocabularies for example can be rendered more visual as a digital overlay and the same applies to usage stats, with popular items on a topic more readily identified and user customised recommendations provided. Folksomonies can also be accessed by the user through overlay visualisations and potentially linked to subject-headings to enhance search strategies. This could place the user at the centre of a web of links, allowing the construction and reconstruction of faceted searches at point of need within the browsing experience. In achieving this the quality and completeness of metadata is paramount and in-house cataloguing and metadata creation skills are a crucial resource in effectively undertaking the AR approach.

Precise methods of interaction will develop further over-time but initially emphasise a QR-code approach, although barcode scanning is currently faster in terms of computational response speed. As the technology advances however more futuristic interaction with the digital overlays will become possible (Castellanos & Perez, 2017).

The use of Geographical Information Systems (GIS) can also leverage the classification scheme to support way-finding around the library stacks. AR-Library can draw on the strength of the catalogue in creating connections between multiple holdings in different physical areas and guide the user between them. The Topic-space project provides an excellent example of the tools in use (http://journal.code4lib.org/articles/10881). This project leveraged both subject headings and classification to connect stock across the library, classmarks were initially used to provide recommendations of further reading and with improvements in AR supporting technologies this approach will become increasingly efficient. Personalised recommendations, increasingly used as an approach in marketing, were incorporated alongside way-finding technologies. The project represents valuable advances in implementing AR aspects into the library.

Conclusion:

AR-Library melds the catalogue and classification scheme to expand access points. It is underpinned by GIS technology; with interaction through smart-phones, although alternatives will present themselves in the future. Already a number of libraries around the world are leading advancements in making AR-Library a reality and UK libraries should not be left behind. Crucially AR-Library enhances user connectivity to metadata, placing the cataloguer in a critical position for the realisation of AR-Library's goal of a more completely faceted and interlinked serendipitous browsing experience.

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Babel, babble and info-speak: could an encyclopedia help?

Stella Dextre Clarke, Vice-Chair, ISKO UK & Vice President, ISKO

Have you ever felt your heart sink in a committee meeting, when someone has raised the question of definitions and the whole table has succumbed to an interminable exercising of hobby-horses? "Keyword", "Information", "Subject", "Taxonomy", "Index", etc; any of the terminology essential to our own specialist area seems capable of stirring up passions, controversy, and unending confusion. Even though the same may happen in other domains, it feels especially ironic that the profession that urges disciplined management of information should so struggle to standardise its own terminology.

Plenty of us have tried to address the problem by publishing definitions, sometimes whole glossaries. If only everyone else would read them, and use them consistently! One recent effort is *ISO 5127:2017*, "*Information and documentation -- Foundation and vocabulary*" published this May. According to the advertising blurb, this international standard "*provides a concept system and general vocabulary for the field of documentation within the whole information field. It has been created with a balanced representation of major work areas in mind: documentation, libraries, archives, media, museums, records management, conservation as well as legal aspects of documentation.*" Priced by BSI at £386 (where it is branded *BS ISO 5127*), one wonders how many sales there will be in the UK. That said, if I understand the website correctly one can buy it direct from ISO for just CHF 38.00.

For some years ISKO (international Society for Knowledge Organization) has had an aspiration of producing a more specialised glossary, but latterly this hope has been displaced by a more active project of publishing an online encyclopedia – the ISKO Encyclopedia of Knowledge Organization (IEKO) – to be freely available to members and non-members alike. This ambitious reference work is already taking shape at http://www.isko.org/cyclo/index.html.

An introduction on the web page makes it clear this is a scholarly endeavour:

> "*This is an online, open access encyclopedia of knowledge organization hosted by ISKO and produced by ISKO Scientific Advisory Council. It will contain entries about concepts, disciplines, organizations, systems, standards, and theories etc. including important domain specific systems.*

> "*The encyclopedia is peer reviewed, all articles are signed by author(s), dated and versioned (new versions may be distinguished as, for example, Version 1.1 for minor changes of version 1 and Version 2 for major changes). We try to get articles by the best experts in the subject of each article and to maintain a high scholarly standard. The first accepted version of each article is also published in a section of Knowledge Organization: Reviews of concepts in knowledge organization. A version is also archived in WebCite.*"

The plan is eventually to cover the whole field of Knowledge Organization, from classical concepts and systems to up-to-date advanced technologies, concepts and issues. The prospect is of a very useful reference source for CIG members. Plainly it will take a while to commission articles on so many topics and peer-review them all. But at least 20 authors are hard at work, and already first versions of the following entries are in place:

BISAC Subject Headings List

Classification

Colon Classification (CC)

Diagnostic and Statistical Manual of Mental Disorders (DSM)

Domain analysis

Integrative levels

Knowledge organization (KO)

Knowledge organization system (KOS)

Literary warrant

Logical division

Mathematical theory of classification

Reader-interest classifications

Subject (of documents)

Thesaurus (for information retrieval)

The articles vary in length. As a contributor myself, I found it a challenge to work out the right breadth and depth for a topic. I felt reasonably pleased with the first draft I submitted (6250 words, or 8,000 including the references). It's readable, helpful, with a coherent structure, I flattered myself. But then the referees came back (like Oliver Twist) asking for more. The version that the editors eventually agreed to accept has over 13,000 words, and I doubt if anyone could bear to read it at a single sitting. Some of the logical structure has gone fuzzy too. But maybe an encyclopedia article is for reference, not for easy-reading? Maybe a convoluted thread of discussion is OK, if you insert plenty of hyperlinks between the sections? Or maybe there will be requests for a revised update? Or might another author be inspired to do better? The digital medium does offer scope for innovative approaches.

That raises the question of how best IEKO should reflect the technological opportunities of the Internet, and the social networking expectations of today's wired audiences. With so few articles up there, the extent of cross-linkage is currently fairly limited, but in time I guess there is scope for more interactive capabilities. One difference from Wikipedia is immediately clear: no chance of another writer coming in and enhancing (or wrecking) the original author's work! But could there be a less intrusive way for readers to attach comments to articles and generate a discussion? We shall see what emerges.

I began this news piece with a groan about the way our profession disciplines its own terminology. I'm not sure IEKO will put an end to the debates. But at least it should provide some enlightening fuel for them.

RDA for arts researchers and specialist libraries

Stephanie Moran, Librarian, Stuart Hall Library

Introduction

I am fairly new to both MARC21 cataloguing and the CIG group, having recently completed the CILIP basic cataloguing training, and I was fortunate to be selected for the CIG sponsored place at the extremely popular 'RDA in a Day' course.
I would very much welcome any feedback, comments or suggestions in response to my report.

The **Stuart Hall Library** (SHL) is a specialist reference library in Shoreditch, London, that holds the collections and research of the arts organisation Iniva (Institute of International Visual Arts). As Librarian and Manager of a library with an international arts usership, it is important to me that we move to international industry standards of cataloguing and that we are accessible and visible online for researchers around the world. I am currently implementing a move to a new Library Management System (LMS) that will hold full MARC records (our current one is MODS, or Metadata Object Description Schema, -based[1]). This article considers the implications of updating our records to RDA (Resource Description and Access) for the future of the library data.

The RDA in a Day course took a very practical, hands-on, practice-lead approach, which gave me a good understanding of RDA's structure and how to apply it. It provoked conceptual questions for me about the nature of linked data, how it differs from the AACR2 (Anglo-American Cataloguing Rules) model, and – most importantly – what might be the advantages of RDA and linked data in general and for the Stuart Hall Library (SHL) collection in particular; what can it do that our current record structures can't? When many new Library Management Systems and discovery systems have the capacity to search anywhere in the records for any piece of information, and to search across library's collection catalogues and archival systems, what is the value of RDA's linked data structure? What is the conceptual framework of RDA, what are its implications for searching and retrieving information, and how might it affect the shape of knowledge? Below, I consider the potential of RDA and possible future applications for SHL as I understand them from the RDA in a Day course and from my subsequent research.

Case Study: Stuart Hall Library (**SHL**)

Context: Iniva is an evolving, radical visual arts organisation dedicated to developing an artistic programme that reflects on the social and political impact of globalisation, and issues surrounding the politics of race, class and gender. The Stuart Hall Library supports the work of Iniva by documenting and facilitating its research into the contemporary visual arts within an international and transnational context, as well as providing critical material on issues of cultural identity and offering a specialist collection for researchers of international art and cultural theory. The geographical scope is broadly international in focus, with an emphasis on art and artists from Africa, Asia, Latin America, and UK artists from diverse backgrounds. The collection contains foreign language and dual language exhibition catalogues, and has holdings for many biennial exhibitions around the world going back to the first Sao Paolo Bienal in 1951.

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1. https://www.loc.gov/standards/mods/mods-overview.html

Benefits and Applications of RDA for SHL

Accessibility and sophistication of information: modelled on the semantic web stack rather than the analogue catalogue card, RDA is conceptually structured around the thing in itself and its user tasks, rather than fitting it into the pre-existing requirements of a card-based indexing system. The object oriented approach articulated by RDA's 'WEMI Stack' structure, constituted from the conceptual entities Work, Expression, Manifestation, and Item, gives the capacity for more specificity and for complex relationship modelling between entities and attributes. The entity elements are held separately, coming together as summoned when searched. This structure adds the capacity for semantic queries which are much more sophisticated than Boolean searches, and for machinic inferences to be made from the data.
When applied to a specialised library collection, keyword linked data searches performed in closed systems have the potential to generate valuable seams of connected resources, including different manifestations and editions of items, and complex relationships between items and agents in their specific collection context. The ability to better link and interrogate the rich data we have indexed, abstracted and created controlled vocabularies for, over our 24 years of collecting, would be invaluable to Iniva and to our usership of artists, arts professionals, researchers and academics.

Breadth of information: RDA's removal of AACR2's 'rule of three' means that the cataloguer can choose to record all, some, only the first or none of an item's multiple attributes, which gives more flexibility and ability to record the fullest information. This is important to SHL's exhibition catalogues collection, especially the international group exhibitions and biennials, to record and link often marginalised or incomplete information about non-Western, diasporic or transnational artists.

Inclusivity of all types of content and media, from print to AV and digital objects. The Library Reference Model of FRBR (Functional Requirements for Bibliographic Records), an object oriented expression (FRBRoo) beginning to be incorporated into RDA, follows the CIDOC 'Conceptual Reference Model'[2] which harmonises data models between museums, libraries and archives. The potential usefulness of this, for Iniva in particular, would be in the aligning of data modelling and metadata standards for art and archival objects with that used for bibliographic records, as SHL has an archive including digital artworks, physical objects and ephemera. Archival data concerned with sources of information and collections (archival fonds) would add context to the SHL collection as much of the material is donated. It would also enhance data for the archive collection, which includes many artist, curator and exhibition files that relate to catalogues in the print collection.

International visibility: RDA facilitates unified cataloguing standards for linked data, modelled on the semantic web and the Resource Description Framework (RDF)'s use of ontologies. Linked data is visible and searchable online, not just in the library catalogue, which enables information from different sources to be connected and queried. This would be valuable in connecting the SHL collection to other relevant collections and resources, and collocating data, particularly with the collection's focus on non-Western, often under-represented or marginalised, artists. RDA's linked data structure has the potential to use controlled vocabularies and formal structured ontologies for information retrieval alongside Natural Language Processing (NLP) and machine learning.[3]

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2. http://www.cidoc-crm.org/

3. See Jones, Ed and Siekel, Michele, eds. (2016) 'Linked Data for Cultural Heritage'

Visual modelling: RDA enables visual representation of information and complex networks of relationships. This is especially relevant to Iniva as a visual arts organisation, and to our large constituency of practice-lead arts and humanities researchers. It would be possible, for example, to map movements of artists in the collection through space and time between cities, countries and continents, via the exhibition catalogues and the related information held within those records. When linked out to external data sources, this could further enhance the number and complexity of relationships mapped.

Less Western, Anglo- and Euro-centric: RDA's potential to add to Authority vocabularies and ontologies, the choice of language, of additions to access points and data supplied, choice of script, transliteration, calendar and numeric system all make it more accessible globally. This is significant for SHL as an opportunity to move away from Western-centric, outdated vocabularies and subjects.

The shape of knowledge

As David Stuart points out:

> "… *when something is encoded, it is encoded with a particular world view. Even deciding what is to be encoded and what isn't has implications for the representation of marginalised voices and perspectives... It is important that we move beyond the limited ontologies of the commercial sector, and for that to happen there is an important role for the library and information professional.*"[4]

I would argue that it is also encoded, more subtly, within a particular structure, in a similar way to how we think being limited and shaped by language.

In thinking about how linked data might affect the shape of knowledge, it is important to recognise the non-neutrality of databases and infrastructures. I will sketch four examples, from items in the SHL collection, a paper by a researcher Iniva has recently worked with, and an artistic practice case study I am working on, to demonstrate some considerations for the future shape of thought.

1. **Digital Media Researcher Ramon Amaro's 'Racial Profiling in Data-driven Decision Making':** Amaro discusses the ethics of data-driven technologically-made decisions that are "by the very process of their design, fallible to social consequences that are most frequently articulated in forms of biases, segregations and other social restrictions."[5] Whether datasets are generated by corporations or the state, as with any information, it is important to ask how, why and where they are generated, but also how they are applied. Machine reading of data often misses nuance, and algorithms often reinforce inherent biases.

2. **My case study on the practice research of Maggie Mer Roberts / OrphanDrift in response to a Goldsmiths Library collection:** Roberts' work with the machine vision of the popular DeepDream tool initially returned disappointingly repetitive image results, rather than continually evolving the imagery from her inputs as she had expected. She realised that the machine learning was hindered by its coding, which instructed it to recognise forms that had already been fed into it. Once recognised, it would fix on and duplicate that form within the image. The machinic intelligence "*describes only what it is trained on*",[6] reproducing more of the same. Roberts is working with a coder to attempt to resolve this and build a DeepDream algorithm that evolves independent of human coding mandates.

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4. Stuart, David (2016) 'Practical Ontologies for Information Professionals', p157.

5. Amaro, Ramon (2016) 'Machine Learning and the Politics of Data', and 'Machine Learning and Racial Profiling in Data-driven Decision Making'

6. Barcelos, Iendl and Vertolli, Michael O. (2016) 'Transformations in Shifting Models: Reorienting with DeepDream', Journal of Creative Music Systems Vol. 1, Issue 1, September 2016. Available at: http://jcms.org.uk/issues/Vol1Issue1/3/3.html (Accessed: 10/08/17)

Maggie Roberts—Deep Dream digital sketch

3. Peter Sloterdijk's 'Spheres':[7] Sloterdijk argues that the structure and form of the sphere has shaped thought and philosophies since ancient times, up to its contemporary conceptual iteration of the globe in 'globalisation' – currently an era of 'electronic globalisation' – as articulated in his description of globalisation as "*the encounter between being and form in a sovereign body*".[8] Perhaps the new morphology for philosophy will be the stack rather than the sphere.

4. Benjamin Bratton's 'Stack':[9] Bratton portrays the geopolitics of the stack through the layers Earth, Cloud, City, Address, Interface and User. Cyberterritories overlap with geographical territories and jurisdictions, creating "*new spatial and temporal models of politics and publics*". The RDA version of the stack based on Work, Expression, Manifestation and Item constitutes a similar open territory of potential for global knowledge organisation systems. Bratton's concept of the Black Stack, or "*the platform that might be*", which is "*defined at this moment by what it is not, by the empty content fields of its framework…*"[10] is useful in thinking the potentiality of RDA for future thought – the kinds of information it is made up of is just as important as its form – and taking into account that "the *decisions that are made about the structuring of an ontology and the properties that are selected have important ramifications in the way people both view and access resources.*"[11]

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7. Sloterdijk, Peter (2013) 'In the World Interior of Capital'

8. ibid, p9.

9. Bratton, Benjamin (2016) 'The Stack: On Software and Sovereignty'

10. http://www.e-flux.com/journal/53/59883/the-black-stack/

11. Stuart, op cit. p49

Conclusion

Biased and outdated information and knowledge structures can only be de-skewed through international accessibility and cooperative efforts, which RDA's linked data structure and capability for linked open data visible beyond individual library information silos has enormous potential to enhance. From the point of view of diversity of information, rather than a proliferation of the same, Librarians have a responsibility to make specialist knowledge and marginalised discourses accessible and visible. RDA seems to be the most effective means of doing this, as well as being able to represent the range of different objects in SHL's collection. While the full RDA stack structure is not currently supported by any LMS, SHL's new LMS is FRBR -ised and the records have been upgraded to include RDA fields, preparing for future RDA-compatible systems developments.

Thinking about Classification

On 28 June 2017, a workshop was held at CILIP's London HQ on the topic of classification. The day was split equally between a series of inspiring and informative presentations, and group discussions.

The day formed a collaborative workshop, with lots of opportunities for librarians to learn from each other's practice and gather advice to apply to their own collections. There was as much communal discussion as formal presentation, and group activities on localisations, ethics, and classification advocacy. Speakers presented and conducted surveys on the consumption of the various schemes to find out which were being used in different libraries and why, and where schemes had been tailored to suit specific needs, or replaced by an entirely local scheme.

What is classification?

Deborah Lee of the Courtauld Institute of Art opened the workshop with an introductory discussion distinguishing classification from categorisation and cataloguing. She defined the classification scheme as a source for location and retrieval.

Lee identified a classification scheme as a system of knowledge organisation, which could be defined as a document in its own right, or an aesthetic object, whose anatomy comprises schedules, instructions and citation orders, an introduction of philosophy and context, and an index. A scheme notation's desired attributes were identified as hospitality, brevity, expressiveness, and mnemonics.

She also covered the concept of facet analysis – the breaking down of complex subjects into elemental concepts – and identified this as a key attribute of sophisticated classification schemes, whose ordering can either collocate or scatter a subject. The process of classification moves from subject analysis, to translating the subjects into the scheme's language and concepts, to assigning notation, then adding a suffix or 'Cutter' to create the classmark.

This workshop also asked *why* we classify. The answer is for retrieval, of either a known item or to make browsing more relevant. Lee noted that classification often operates so that like stays with like.

UDC

Aida Slavic, editor-in-chief of the UDC, spoke about new members of the consortium, including the national libraries of Czech Republic, Slovakia, Slovenia and Croatia.

UDC is markedly international in its focus, simultaneously developed in 4 languages and updated nearly every year. There are 3000 UDC classes in 57 languages available as Linked Data under a Creative Commons licence, 13 languages in an abridged subscriber and 9 languages in the Complete 72000 classes, as of September 2017.

She noted that the process of classification is moving away from libraries and towards publishers with pre-purchased metadata. Emerging stakeholders are looking for tools for managing multilingual access, semantic expansion and subject access via a switching language that can facilitate mapping for a cross-collection search.

Revisions

Slavic observed that the primary motives for revision include adding new terminology for new areas or geopolitical subdivisions (when the administrative division of modern countries change) and correcting biases (which usually involves changing the terminology but not the class). Despite the best intentions, she also noted the difficulties of revision – when a scheme is used in at least 150 000 libraries in over 135 countries (as is the case for UDC), then many will continue to use cancelled numbers 20-50 years after the classes have become obsolete, because reclassifying requires extra work.

Reclassification

The taxonomy of reclassification includes merging, updating, localisation, standardisation, or a change of scheme. Lee discussed different types of reclassification including 'guerrilla reclassification'.

Siobhan Cottom from Nottingham College provided a case study of a classmark for fashion growing too full at her library. She needed to introduce more specific bibliographic divisions to enhance efficient retrieval. The group recommended soliciting student warrant and working from the top down, rather than book up, to aim for collocation rather than dispersal, and to aim for a maximum of ten books per number.

Ethical issues

While working within historical constraints, classifiers can effect changes in schemes and knowledge communities dictate the organisation of their knowledge. The 'Thinking about classification' workshop discussed the nuances of neutrality and objectivity, pejoration, error, and the importance of factual resources. Unethical classification can lead to a disengaged and disenfranchised user base, and an attentive attitude towards voices and ownership should propagate enhanced representation and retrieval.

Historical errors and pejoration include out-of-date borders and colonial geographic hierarchies, such as the imposition of colonial US subdivisions on indigenous nations in earlier editions of Dewey Decimal Classification. Alongside the ethical issues of descriptive terminology, there is the potential for offence in hierarchical position. Melissa Adler was cited as a recent contributor to the study of problematic parent classes in her study of the classification of sexuality at the Library of Congress in *Cruising the Library* (2017). Finally there is the comparative order and size of classes, which often favour a US-centric view of history, and an overwhelmingly Christian representation of religion.

The Future of Classification

Vanda Broughton questioned the assumptions that classification is an obsolete, artificial, 19th century practice and whether hierarchy should be abandoned in favour of links. She argued that systems must proceed to enhance discoverability and that pattern and predictability of a map-domain model allows inference into the unknown. Running through the history of classification, she covered H.E. Bliss' theory and Otlet's advocacy of analytico-synthetic tools designed for retrieval rather than physical organisation and the representation of complex content, returning again to Ranganathan's concept of idea, verbal and notational planes (the final one might form the control device of URLs).

Broughton conducted her own survey of 50 of the top UK University libraries to find that 48/50 use LCSH for subject retrieval and, 20 use DDC, 18 LCC, 6 local, 2 Garside, 2 UDC, 1 Bliss, 1 NLM, and 15 use more than one major scheme.

She noted that the role of classification is more limited with online discovery and without browsing, and that booksellers' categorisation systems are gaining momentum through libraries' outsourced processing. The future of classification faces its own technical problems: automatic classification from natural language processing, extraction relationships and hierarchies, and the automation of images. Despite these challenges, Broughton maintained that classification underpins most tools that work in digital faceted information architecture: classification for reasoning and the semantic web relies on access to structured data.

Tags from the CIG blog on specific areas of interest:

authority control book reviews Catalogue and Index cataloguing CIG activities CIGS classification committees and working groups conferences Dewey digitised material Dublin Core events folksonomies linkblog MARC metadata news RDA Semantic Web social software standards taxonomies UDC