Classification, knowledge organization and subject access

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Introduction

A paper published in a leading journal in 2012 asked 'Is classification necessary after Google?', addressing the challenges posed to traditional classification by digital technologies.[1] The author's answer was that classification is still necessary, but that it needed to be re-examined and understood in a different way, always taking into account the domain in which it operates.

British information work in classification in the years 2011–2015 reflects this more flexible view of subject organization and retrieval, characterized by the new concept 'discoverability'. This was a particularly interesting period in the use and development, not only of classification schemes, but also of other methods of knowledge organization. There was a notable convergence of practice towards the use of a smaller number of formal classification schemes for the physical organization of collections, but this was accompanied by some innovative applications of alternatives to the classification scheme such as categorization systems and discovery tools. The relevance of classificatory systems to areas of professional activity other than cataloguing and information retrieval was seen in a small literature on knowledge organization as an aid to reader development and on information literacy.

Part of this more generalized approach to metadata and discoverability was the Jisc Resource Discovery Taskforce (RDTF), and its major programme *Discovery: a metadata ecology for UK education and research.*[2] Beginning in 2011 *Discovery* encompassed a variety of projects covering technical, business, and professional aspects of access to resources. A major element of the work was to examine authorities and metadata formats. While *Discovery* covered all kinds of collecting institutions, including museums and archives, it supported two major library projects, COMET (Cambridge Open METadata)[3] and Jerome, carried out at the University of Lincoln in 2011.[4] Both are concerned with bibliographic standards and linked data in a broad sense, but from a subject perspective COMET specifically mentions FAST (Faceted application of subject terminology)[5] and VIAF (Virtual International Authority File)[6] headings as part of the research. Jerome was concerned with the development of a single integrated search across all resource types in the institution.[7]

A closely related enterprise starting in 2015 was *schema.org*, a collaborative effort between large search engines and the wider web community to develop a unified approach to structured metadata.[8] Connecting discoverability

with linked data was the LUCERO (Linking University Content for Education and Research Online) project carried out by the Open University.[9]

Professional education

2013 saw the introduction of CILIP's Professional Knowledge and Skills Base (PKSB), in which knowledge organization featured as a 'core' requirement, ensuring its retention in LIS curricula. CILIP puts 'Organizing knowledge and information' as one of the top categories of the PKSB:

> It involves organising all types of knowledge, information and other resources including the development and use of tools, strategies and protocols, and enabling these resources to be organised, searched and retrieved effectively. Includes cataloguing and classification, metadata and thesauri, subject indexing and database design.[10]

In that context it is useful to take a look at the place of classification and indexing in the LIS curriculum. In the previous period it was suggested that, while there was a resurgence of interest in these areas in the 21st century, coverage in many degree programmes tended to be superficial. This continued to be the case, with one graduate observing that, although his library school education had covered the purpose of, and need for, organization and indexing of library materials, there was no teaching of practical skills, and he could not have worked as a cataloguer without further, independent training.[11]

Of the fifteen CILIP accredited postgraduate courses in the United Kingdom,[12] thirteen provided details of module titles and, to a limited extent, content. Names of modules which relate to knowledge organization were varied, with only UCL's programme including cataloguing and classification. Generic titles containing 'organization', such as 'information organization', 'knowledge organization' or 'organization and retrieval', were chosen by six programmes. Two opted for 'information management' and two for 'information retrieval', although the latter was unlikely to include anything relating to conventional library tools such as classifications, thesauri or metadata. Overall the broader scope of modules which might include databases, search engines, systems librarianship and computerized techniques had comparatively little space for conventional classification and indexing methods, or cataloguing and classification standards, at either a practical or a theoretical level.

A new means of access to professional education was represented by Glyndwr University's two-year Foundation Degree in Library and Information Practice (FdSc), the first of its kind.[13] A one-year conversion course led to a BSc in Library & Information Management, from which the first cohort of students graduated in 2013. The latter included a core module in information resources and organization.[14]

Some published papers encouraged the re-purposing and transferability of 'traditional' cataloguing skills, and commented on their relevance to cognate fields, not only for metadata assignment but also for subject indexing.[15] This

seems in line with a broader interpretation of subject description as a professional activity.

The general schemes of classification

As in previous volumes, the trend continued towards the use of the 'big' classifications, Library of Congress Classification (LCC) and Dewey Decimal Classification (DDC), driven by the need for economy and the now normal practices of downloading catalogue records or outsourcing cataloguing entirely. There is evidence of some variation in the proportion of work which was done in house, particularly between academic and public library services, the latter being more likely to devolve the whole process to a supplier.[16] Overall there was considerable dependence on outsources for more straightforward material, but most academic libraries 'still did a lot of work relating to ordering, classifying and cataloguing stock'.[17]

Several commentators reported on initiatives to standardize their individual library's use of classification schemes and subject headings, sometimes by retrospective amendments, or through centralized cataloguing and classification within a library service, the latter perhaps in multi-site institutions where previously cataloguing had occurred locally on the different sites. In one institution (University of the Arts, London), peripatetic cataloguing staff were used to standardize practice across sites.[18]

In many cases classification project work concentrated on the implementation of the standard version of a large scheme, particularly Library of Congress Classification, where local variations and customizations had been used in the past.[19] There was evidence of the same practice with DDC at Leeds Metropolitan University (now Leeds Beckett University), where 'some of our academic librarians liked to do things their own way—e.g. re-writing parts of the Dewey schedules, [and] creating local subject headings'.[20] A typical case was the University of East Anglia where LCC had been used throughout the institution from its beginnings, but where the library had 'chosen to adapt its Library of Congress (LC) classification scheme over the years to accommodate specific local needs and preferences'.[21] The extent of this local modification was ultimately revealed to be extensive and gave a good sense of the gap between standard application of a scheme and the same scheme adapted to local needs. Of the 850,000 items in UEA's collections the project team 'ended up re-labelling 660,000 and moving 750,000 books'.[22]

Nevertheless, there were still some prominent examples of modification of a large general scheme to suit a subject specialist collection, as in White's account of the Tate Gallery's local use of Universal Decimal Classification (UDC),[23] and Lee's description of the Courtauld Institute's customization of Class N Fine arts of LCC.[24] The latter stressed the responsibility for continuing revision and maintenance that adaptation places on the institution, and outlined the method of 'guerrilla' classification that the Courtauld employs.[25]

In a number of cases reversion to a standard form of a scheme was a necessary preliminary to outsourcing cataloguing, particularly through the

acquisition of shelf-ready stock. An increasing number of libraries made use of shelf-ready services, although this was not as yet widespread in the academic sector as in public libraries.[26] A CILIP event on shelf-ready services held in 2011 showed that there was some variation in the source of the classification data.[27] Many academic libraries themselves provided cataloguing and classification data to the suppliers at the time of order, this data determined either by cataloguers, or in some cases, subject specialists.[28] The use of shelf-ready reinforced the use of standard LCC and DDC, and could make local variation or customization difficult, even when there were good grounds based on user needs and expectation.[29] Real problems could be encountered with generic provider data where a library used truncated classmarks or anglicized LCSH for example.[30] A public library view was contributed by Coburn;[31] in contrast to the academic sector, shelf-ready provision was of some decades standing, and more interesting from the perspective of changes to what was provided. Suppliers now managed the whole chain from stock selection to final processing, with the 'finished product' delivered direct to the relevant branch.

Reclassification projects

The period of large scale reclassification appeared to be past, and there is little in the literature relating to major projects which might have provided some evidence of the classification schemes in current use. Glimpses of practice, however, can be gained through articles on retrospective conversion and other cataloguing ventures, where the classification scheme is mentioned as a secondary concern. Reclassification from one scheme to another was most likely to occur where collections were physically merged, and minor collections were reclassified to the dominant scheme (as was the case with Oxford's large scale conversion to LCC). A typical example was De Montfort's change from National Library of Medicine classification to Dewey when its nursing library was integrated with the main library, despite the much greater suitability of NLM.[32] As was noted in the previous volume, an exception to the overall trend is the adoption of Moys' classification for law books,[33] introduced in more than one library,[34] although usually within the general framework of LCC into which it is designed to fit.

Current use of knowledge organization tools

Determining which tools and systems were used for subject access in individual libraries was often very difficult, as few library websites provided any information about their classification schemes, subject heading and keyword lists, or discovery tools. In order to identify general trends and preferences in the use of individual schemes, an examination was carried out of the library catalogues of the first 50 institutions in the UK university league table published by the *Complete university guide*,[35] where the systems in use were inferred from the subject metadata on individual catalogue records. Where multiple schemes were in place throughout the institution, the cata-

logue of the main university library was used as the evidence of its principal classification system. This might be regarded as misleading in the case of large, collegiate and multi-site libraries, where multiple classifications are in operation. For example, the Bodleian Library has its own classification (now very unlikely to be changed), although the University of Oxford as a whole has a commitment to standardization in classification in the form of LCC, to which numbers of collections have been converted in recent years.

For the purposes of the survey, searches for simple concepts (such as 'horse', 'management', or 'diabetes') were carried out on the main catalogue in the hope that these would retrieve records across a range of subjects, and thus reveal any minor classifications in use for particular collections. Where possible the search was restricted to books only, to retrieve a good proportion of records containing classmarks or shelf locations.

There were clearly limitations on this methodology since one cannot be certain that all possible classifications were exposed in the search. In addition, the top 50 places may be skewed towards older institutions, including the civic and redbrick universities, potentially with a higher occurrence of in-house systems. Nevertheless it provided a good indication of the systems in use. In reality there was complete representation of the eight 'plate glass' universities, and there were ten other institutions founded in the 1960s, with three universities dating from 1992 or later. In terms of geographic distribution, there were eight Scottish universities, two Welsh, and one from Northern Ireland.

This survey of academic libraries confirmed the current dominance of LCC and DDC. Perhaps surprisingly, DDC was the more popular with 20 of the 50 institutions using it as opposed to LCC's 18. Six universities used a local scheme or combination of schemes, and two (UCL and Leeds) used the more identifiable Garside, devised by the librarian of that name. Otherwise two used UDC (Bath and Imperial, the latter already in process of changing to DDC), and one (Lancaster) used Bliss's Bibliographic Classification. St George's in London (teaching medical sciences only) used the National Library of Medicine (NLM) scheme.

Older libraries often had a mixture of classification schemes applied to collections that had been merged or acquired through amalgamation of institutions; special collections in particular made use of in-house schemes. This was less the case for newer university libraries, although they too may have resulted from the merger of multiple institutional collections. Of those fifteen institutions observed as using more than one major scheme, four used DDC in addition to LCC, two used LCC (with DDC and NLM), and one used UDC in addition to DDC; there were six users of NLM for medical collections, and two examples of Moys applied to faculty or departmental law libraries. Six libraries used an in-house scheme alongside a major scheme.

Libraries responded to this diversity of practice in various ways. With the burden of subject retrieval now commonly borne by subject headings or discovery tools, libraries appeared more tolerant of multiple classifications,

and there was less taste for reclassification of whole collections than in previous years, doubtless because of the expense of such projects both financially and in terms of time and human resources. Where a new classification was introduced, or a choice was made of a preferred scheme for all new acquisitions, older material may have been left in its original arrangement. A notable exception is the University of Oxford, where a programme of conversion to LCC has been in process for several years now, partly in conjunction with the merger of smaller subject specialist collections into larger faculty libraries. Nevertheless, the collegiate nature of Oxford, and the existence of its many departments and institutions, means that a number of classification schemes were still represented in the Oxford online catalogues. The same is true of Cambridge, and of other older universities with a complex institutional structure, where the persistence of subject specialist schemes and local in-house classifications could be observed.

Subject specialist schemes and the lesser used general schemes were more likely to be found in the special and research libraries not considered in this survey. The Bliss Classification Association website records nineteen current users;[36] although it omits the Zoological Society of London and the Radzinowicz Library of Criminology in Cambridge it is likely that one or two of the listed names have abandoned the scheme, so this is a reasonable indication of the scale of use. There are no available figures for the use of UDC in special libraries, although a recent study suggests that it falls into the middle group of countries where UDC 'is used in some type of libraries and in these countries it is used alongside other dominant classification system(s)'.[37] To the author's knowledge, UDC is used in at least fifteen special libraries, including those of the Royal Institute of British Architects, the British Film Institute, the National Maritime Museum, the Royal Society of Chemistry, and the Scott Polar Research Institute (SPRI), the last assisting in the maintenance of UDC for Polar libraries. In 2014, UDC was being applied to museum objects in SPRI's Antarctic Cataloguing Project at their Polar Museum, another example of a flexible application of a classification.[38]

DDC was, naturally, almost ubiquitous in UK public libraries, with the Edinburgh City Library the only exception (Edinburgh has used LCC from its early days). There were occasional examples of DDC classmarks in Edinburgh's branch libraries,[39] and, like many public libraries, it used both classifications within the broad context of a categorization, or user interest, system.

Categorization

Categorization remained popular for public library collections 'as a means of simplifying the arrangement on the shelf, if not on the catalogue'.[40] Although in-house categorization schemes were still to be found, there was a trend towards shared solutions, particularly where authorities were part of a purchasing consortium and books arrived with standard metadata, such as that of the Central Buying Consortium scheme.[41] Categorization systems used by the book trade were also a strong influence on libraries, and tended to be adopted

as the basis of local arrangement.[42] The dominant categorization system used in the UK was that of the Book Industry Communication (BIC) subject metadata used in trade databases,[43] an international version of which, *Thema*, was launched in November 2014. Its rationale and general content were described in an article in CILIP Update where *Thema* was not considered suitable for academic libraries, but 'could well offer the right level of granularity in an easy to understand way for public libraries'.[44] *Thema* has around 2,700 classes, and can be used post-coordinately which makes it 'suitable for faceted search'. Take-up in the UK appears limited so far, probably because of the popularity of the existing BIC categories.[45] During this period the Book Industry Communication project, BIC E4 Libraries included the development of the Standard Library Categories,[46] a subset of categories derived from the BIC system, and intended specifically for public library use.[47] The final version was published in January 2016,[48] and included categories for fiction and non-fiction, and for children's and young adult material.

We also learnt that even simple knowledge organization systems of this kind could support users in ways other than finding resources through search or browsing. The indexing and organization of fiction titles on the basis of genre was a significant factor, not just for cataloguers but for professionals in the fields of stock promotion and of reader development.[49]

Subject headings

In a similar vein, a small body of literature appeared on the use of subject headings or descriptors, as opposed to classification numbers, in library signage,[50] since 'students do not necessarily understand the Dewey Decimal Classification scheme'.[51] Nevertheless, the classification still served its purpose in providing a browsing structure for students who 'were aware that books on similar topics were shelved nearby, and browsing after retrieving one book on a specific topic gave them the opportunity to discover other books on the same or closely related topics'.[52]

Library of Congress Subject Headings (LCSH) was now the norm in British academic libraries, with 48 of the 50 libraries surveyed using this standard, the remaining two using a local system of headings. Four libraries used a local subject heading list or thesaurus in addition to LCSH, and seventeen used Medical Subject Headings (MeSH) for medical resources. The United Kingdom preference was still for the 'full' version of LCSH rather than the FAST (Faceted application of subject terminology) version which was being used only at the Bodleian Library among the ten international adopters of that system.[53]

Discovery tools

Discovery tools, drawing their subject content from data such as LCSH in the bibliographic records, were even more widespread, with every single institution surveyed having one in place. Several case studies of implementation of a discovery tool were featured in the March 2013 issue of *Catalogue & index*,

including the University of Hull (Blacklight), Sheffield Hallam University (Summon), and the University of East London (Primo).[54] The great advantage of the discovery tool was the easy manner in which it revealed resources to the end-user when compared to the more complex structure of the catalogue. The simple search box, powered by the discovery tool, and usually present on the library home page, was now the principal connection to the catalogue, and its impact on use of resources could be considerable; Birmingham University reported a 96% increase in visits made to the library website for 'resource discovery' after the introduction of the Primo discovery tool in 2013.[55]

A 2013 survey commissioned by the UK Serials Group found that, although the primary motivation for libraries was not to improve usage, but rather to enhance the student experience, discovery technologies did in fact increase the use of e-books to a marked degree, but e-journals to a much lesser extent, if at all.[56]

As in the case of fiction categorization mentioned above, discovery tools were also useful in ways other than straightforward retrieval. A study at Hull University confirmed that the discovery tool (in their case, Summon) was particularly used as the initial search, but that it could form part of a more sophisticated programme of information literacy education.[57] This was part of a wider interest in the information literacy role of discovery tools.[58]

Of the available proprietary software packages, Primo was the front-runner in the survey with 33 users, followed by Encore with nine, and Summon with five. One library used Ebsco's discovery tool, and one other a locally devised search tool using open source software. One system could not be identified. The UKSG survey carried out halfway through the period already showed the dominance of the three leading products with only one institution using any of the other (then) available systems. However, Ebsco's discovery service had a much greater share of the market (24%) in 2013, with Encore rising to fill the gap by 2015. Some popular tools noted in our 2006–2010 report, such as Aquabrowser and VuFind (which had been in use at LSE and the University of Kent),[59] had disappeared completely from the 50 libraries surveyed for 2011–2015, although Aquabrowser was still popular with public libraries (Essex, Barnet). An analysis of then available systems by Chambers in 2013 suggested that this fluctuation may have been due to changes in the commercial ownership of the various tools.[60] What was apparent was the move from a rich choice of discovery systems in 2011 to a concentration on a much smaller number of options, comparable in some respects to the reduction in the number of classification schemes in widespread use.

It was observed that most libraries adopted a local name for the search function of their discovery tools (such as Explore (UCL), BroadSearch (UEA), OneSearch (Warwick), and FindIt@Bham at Birmingham) which complicated the identification of individual products. A very small number of libraries made use of a 'virtual shelf' or 'virtual browse' feature to show adjacent books on the shelf, a perhaps unexpected reversion to the classification scheme as a browsing tool.

At the other end of the spectrum, there was evidence of the widespread use of conventional subject organization tools for indexing electronic resources. Paid-to-access materials were now routinely added to main catalogues with attached subject headings, and also on occasion with classification data, despite there being no need for this as an ordering or arrangement device. The same practice was also observed in institutional repositories with the use of subject headings reported at the University of Warwick, where metadata added to repository items was *AACR2*- and FRBR-compliant, and included LCSH.[61]

Publication of the major schemes

This period saw the publication of the 23rd edition of the Dewey Decimal Classification, in 2011, with the associated Abridged Edition (the 15th) appearing in the following year.[62] A UK perspective on the new edition was provided by Trickey.[63] In June 2012 Dewey 23 was released as linked data,[64] and in 2013 Joan Mitchell, Editor-in-Chief of Dewey for 20 years, retired, to be replaced by Michael Panzer, the first non-US Editor.[65]

Intended to be used in conjunction with the Abridged Edition was the single volume 200 Religion Class, which was an updated extract from the 23rd full edition.[66] This volume was prepared in collaboration with the former Editor-in-Chief of the Universal Decimal Classification,[67] and displays the influence of the 2000 revised Religion class of that scheme,[68] which in its turn was based on the Bliss Bibliographic Classification 2nd edition.[69] The aim of all these revisions was to better and more equitably represent non-Christian religions, and to eliminate Christian bias. Dewey's 200 Religion class achieved this structurally, and in terms of the greater vocabulary and number of classes subordinated to each faith, but the notational provision, which cannot easily be changed in such a widely used scheme, still creates an impression of Christian dominance. It is supported by the online Dewey Religion Browser which provides an expandable summary of the new arrangement.[70]

Dewey maintained its print publication of these different editions, alongside WebDewey, the online version, although a decline in sales led OCLC to conduct a survey in 2014 of those who had purchased a print copy of Dewey.[71] This revealed some interesting features of practice. As one might expect 89% of respondents were using Dewey 23 (presumably the print version they had purchased), but perhaps more surprisingly, 36% also used WebDewey. For 38% of the non-users of WebDewey the reason was cost, but 28% simply preferred the book format. Overall, 74% would be likely or very likely to purchase future print editions, and there was a sizeable minority (around 40%) in favour of print-on-demand, PDF, CD or DVD formats. As a result OCLC decided that the 23rd Edition and the 15th Abridged Edition would be the last printed versions of the classification, with WebDewey to become the 'standard' version of the classification.[72] With the needs of smaller collections in mind, a print product would continue to be available, although it was not clear what form this would take.

Library of Congress's decision to discontinue print publication of the Classification and Subject Headings formed part of the same pattern. The 35th (2013) edition of the Subject Headings was the last to be published in print, although free-to-download PDF versions continued to be available from the Library of Congress website, along with other subject indexing tools including the *Free-floating subdivisions*, *Children's subject headings*, and the *Subject Headings manual*.[73] The Classification schedules were similarly freely available together with a detailed outline of the scheme,[74] and archived versions of earlier free editions. The principal means of access to both the Classification and the LC Subject Headings was now the online *Classification Web*.[75]

The move from print to online database as the standard means of access to a scheme doubtless causes difficulties at least for some libraries, apart from usability issues. Continuous updating of the major schemes means that the standard is no longer fixed, but fluid in nature, and would seem to demand that libraries regularly re-process and relocate resources as classmarks change; major changes of the kind that sometimes occur in the form of Dewey 'phoenix' schedules would require major re-classification to be carried out. Reliance on externally produced catalogue records and shelf-ready stock remove the option to retain earlier versions of the classification, as would have been common practice in the past. As yet there is nothing in the professional literature to indicate how libraries are managing this situation.

New revisions of the Universal Decimal Classification included a draft proposal for Class 58, Systematic botany published in *Extensions and corrections to the UDC* in 2011,[76] as well as draft proposals for classes 002 Documentation, 003 Writing systems and scripts, 007 Communication and control, 02 Librarianship, and Class 1 Philosophy, in the following year.[77] In this period many updates and revisions were also made for countries in the systematic auxiliary for place. In 2011 the free-to-access *Multilingual UDC summary* with approximately 7,200 classes, was made available as linked data.[78]

Revision of the *Bliss Bibliographic classification* continued slowly, with the publication in 2012 of Class C Chemistry.[79] This class, in addition to various complete and draft schedules, was published as free-to-access on the Bliss Classification Association website.[80]

2011 also saw the initial publication of the new international standard for thesaurus construction, *ISO 25964 Information and documentation: Thesauri and interoperability with other vocabularies*,[81] consisting of *Part 1: Thesauri for information retrieval* (published August 2011), and *Part 2: Interoperability with other vocabularies* (published March 2013).[82] The working group, chaired by Stella Dextre Clarke, had drawn heavily on the work of the team which produced the British Standard *BS 8723 Structured vocabularies for information retrieval*.

Organizations and events

The UK Chapter of the International Society for Knowledge Organization continued to prosper, holding regular meetings, and three national conferences all hosted by University College London:

2011 'Facets of knowledge organization: a tribute to Professor Brian Vickery 1918–2009';[83]

2013 'Knowledge organization: pushing the boundaries';[84]

2015 'Knowledge organization: making a difference: the impact of knowledge organization on society, scholarship and progress'.[85]

PowerPoint files and audio recordings of the presentations were made available on the conference websites, as well as in the published proceedings. The ISKO UK biennial conference was by now well established as an international venue, and speakers and delegates came from a number of countries as far afield as New Zealand, Australia, Singapore, Thailand, Indonesia, Iran, Brazil, Canada and USA, as well as European nations.

Also at UCL, in December 2014, the Centre for Publishing organized a seminar, *Discovery and discoverability*, looking at a number of aspects of discovery tools.[86]

Notes

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4 *Jerome.* <http://lncd.lincoln.ac.uk/project/jerome>.
5 *Faceted Application of Subject Terminology.* <http://www.oclc.org/research/themes/data-science/fast.html>.
6 *Virtual International Authority File.* <https://viaf.org/> and <http://www.oclc.org/research/activities/viaf.html>.
7 David Kay, Paul Miller and Owen Stephens, 'Towards a metadata ecology for twentieth century education and research', *SCONUL focus* 52, 2011, 23–7.
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27 Claridge, 'CIG Shelf-ready event', 5.

28 Claridge, 'CIG Shelf-ready event', 5 and 6.

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30 Baron, 'Shelf ready processing'.

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