Catalogue & Index

Periodical of the Metadata & Discovery Group, a Special Interest Group of CILIP, the Library and Information Association

December 2024, Issue 209

ISSN 2399-9667

EDITORIAL

Welcome to issue 209 of Catalogue & Index! You may notice a few changes in the look of our journal, this is because we thought it was a good time for a refresh with two new editors taking on the reins.

Before we proceed however, we firstly wish to thank Philip Keates and Martin Kelleher for all their hard work in recent years with the journal, including migrating it to a new platform (as seen with the previous issue). It is hoped that at some point in the future we will be able to migrate some (if not all) of the C&I back catalogue to this platform. Secondly, we'd like to introduce ourselves - Fran Frenzel and Karen Pierce.

Karen is no stranger to C&I having worked as a co-editor previously (2015-2020), she is a Cataloguing Librarian at Cardiff University, and apparently can't stay away from MDG having rejoined the committee in September. Her favourite awkward item that she has catalogued is a medical board game called 'Game of Stools' (to help learn about C. difficile), she also enjoys rare book cataloguing when possible, working on a History of Medicine collection at Cardiff (16th-20th century).

Fran is a newbie to journal editing and MDG; she took on the co-editor role in September. It's been a steep but very fun learning curve since then. She works as a Metadata Analyst at the London School of Economic and Political Science (LSE).

This issue contains articles covering a variety of metadata topics. Opening with an article by

Hannes Lowagie summarising the talk he gave at the MDG AGM in September – 'Harnessing Power Apps and AI for Automated Cataloguing'. All who heard Hannes speak at the AGM found his paper fascinating and we are pleased to share it with a wider audience so you can read about a positive application for AI in cataloguing work. Hannes is also set to publish a book with Facet on the topic next year.

Sean Goddard & Daisy Phipps discuss a reclassification project at the University of Sussex, which moved from a system that was partly devised in-house and was partly a modified version of Library of Congress Classification (LCC), to proper LCC. This article is an update to the project that was previously documented in C&I 188 (September 2017) and looks at the reclassification and integration of 57,500 books in the English Literature collection.

Another follow-up article comes from Tom Mitchell, Tuula Lindgren and Jason Partridge who reflect on the changes the Oxford University Research Archive (ORA) has undergone in the last couple of years to streamline processes, improve automation and remaining compliant with internal and external policies.

We also have an article from MDG's current secretary, Anne Welsh, looking at what Acquisition teams need to know about metadata and giving an overview over the recent developments in cataloguing standards and models.

We hope you enjoy this broad spectrum of articles; perhaps it might inspire you to write something for us. Our March issue will be looking at topics concerning diversity, equality and inclusion issues within cataloguing and metadata, and the June issue will feature artificial intelligence and automation in cataloguing and indexing.

Please get in contact if you'd like to write on either of these topics – or anything else! Contact the editors at cataloguеandindex@gmail.com

Karen Pierce & Fran Frenzel, December 2024

Metadata & Discovery Group

Harnessing Power Apps and AI for Automated Cataloguing

Innovations in Bibliographic Record Creation

Hannes Lowagie 0000-0002-0671-3568
Metadata Librarian, KBR (Royal Library of Belgium)

Received: 01 Oct 2024 | Published: 16 Dec 2024

ABSTRACT

In the evolving landscape of library and information science, the integration of advanced technologies has become essential for efficient and accurate cataloguing. This talk explores the transformative potential of Microsoft Power Apps, focusing on the use of AI components for the detection and enhancement of metadata. We will delve into how Power Apps can streamline the cataloguing process by automating repetitive tasks and ensuring consistency in metadata creation.

Additionally, Power Apps can assist with various other crucial tasks in the realm of cataloguing. We will present initial tests demonstrating the use of Power Apps for creating an RDA application profile, which is linked to an automated validation file. This validation file can be used to ensure individual records conform to the RDA application profile standards.

KEYWORDS metadata enhancement; AI; cataloguing automation; application profiles; Power Apps; Power Automate; record validation

CONTACT Hannes Lowagie hannes.lowagie@kbr.be KBR (Royal Library Belgium)

The Need for Automation in Cataloging

Introduction

Libraries and metadata specialists are continuously seeking ways to streamline their workflows and enhance the accessibility of their collections. The sheer volume of materials requiring cataloging, especially in institutions with extensive holdings like the Royal Library of Belgium, presents significant challenges. Traditional cataloging methods are time-consuming and labor-intensive, making it difficult to keep pace with the growing influx of new and historical materials. Enter automation tools like Microsoft Power Apps and AI-powered technologies, which offer innovative solutions for automating cataloging processes. These tools not only simplify the creation of bibliographic records but also enhance metadata enrichment and validation, transforming the way libraries manage their vast resources. In this article, we explore

how Power Apps and AI are revolutionising cataloging, offering practical, customizable solutions that cater to the evolving needs of librarians and metadata specialists.

Challenges in Traditional Cataloging

For institutions like the Royal Library of Belgium, with its vast collection of 5 million books and 3 million patrimonial objects, the task of cataloging represents a monumental challenge. Manually creating bibliographic records for each item is a labor-intensive process that demands significant time and effort. From medieval manuscripts to modern-day publications, each record requires meticulous attention to detail to ensure accuracy and completeness. Librarians and metadata specialists are often stretched thin, tasked with inputting data, verifying metadata, and organizing resources in a way that facilitates efficient retrieval. This manual approach, while thorough, can lead to bottlenecks, especially when managing large-scale collections. The growing volume of incoming materials only exacerbates the issue, making it difficult for libraries to keep their catalogs up to date and accessible to users.

Power Apps and AI-Builder

What is Power Apps?

To address these challenges, we turned to Microsoft Power Apps, a low-code platform developed by Microsoft. It allows users to build custom applications designed to automate repetitive tasks without requiring extensive coding knowledge. Power Apps can offer a practical solution to develop cataloging tools without requiring advanced technical expertise. Its integration capabilities make it even more powerful, as it can easily connect with various tools and databases such as SharePoint, Microsoft 365, SQL Server, and Dataverse, but also with API and FTP.

Paired with AI, these tools streamline the cataloging process by automating metadata extraction and enrichment. For instance, AI models can identify key metadata elements such as the title, author, publisher, and publication date from scanned documents, reducing the need for manual input. By implementing these technologies, we can ensure faster access to our collections. Automation not only enhances efficiency but also enables librarians to shift their focus to more complex tasks, such as curation and improving user services.

What is Power Automate?

Power Automate is a cloud-based service from Microsoft that helps users automate workflows and business processes. It allows you to create automated workflows between different applications and services, such as Microsoft 365 apps, third-party services, and on-premises data sources. With Power Automate, you can automate repetitive tasks, streamline processes, and integrate data across various systems without needing extensive coding knowledge. There are various triggers that can start a Power Automate flow. One trigger could be a button click in Power Apps, but a flow

can also be initiated by creating a file (such as a scan) in SharePoint or OneDrive. In Power Automate you can also use the Microsoft AI-models

Microsoft AI-models in Power Apps and Power Automate

Microsoft's AI Hub offers a variety of tools that libraries can leverage to build powerful AI models tailored to their cataloging needs. These models can be either pre-trained or custom-built, depending on the specific requirements of a library's collections. Pre-trained models, which are ready to use, can expedite implementation, while custom models allow for more precise handling of unique or specialised datasets. Both approaches offer libraries the flexibility to automate key aspects of cataloging, ultimately enhancing efficiency and accuracy in managing bibliographic records.

A - AI Models Based on Images

One of the most impactful uses of AI in cataloging is the ability to process images for metadata extraction. For example, the "Document Processing" model is highly effective in detecting pre-defined metadata from scanned images of books and manuscripts. The AI examines elements such as the structure of the title page, text placement, font size, and even content-specific information like edition statements. Impressively, these models require minimal training data—sometimes as few as five examples—to start generating accurate results. This makes the process of creating custom AI models more accessible, allowing us to quickly build and deploy tools that automate the extraction of critical metadata out of images of title pages, but also library cards, old maps, periodicals, and so on.

B - AI Models Based on Text

In addition to image-based models, AI also excels in processing textual data. An interesting type for libraries are the entity recognition models. These models, both pre-trained and custom, are capable of identifying key entities such as names, dates, and locations within text blocks (for examples out of back cover text, or parts of the summary or table of contents). Another useful model is the Category Classification model[1], which helps classify your books. To use this model, you need to create a Dataverse table with classification or subject terms in column A and training texts (such as other summaries or texts) in column B. When you train your model, it will assign a term to an unknown text. It functions similarly to other proven tools like Annif[2]. Based on the classification or subject terms you provide, the model will categorize texts into appropriate categories based on detected metadata. Whether a library is dealing with books, manuscripts, or periodicals, these models enable quick and accurate classification, facilitating better organization and retrieval of materials. By employing a combination of image-based and text-based AI models, libraries can automate large portions of their cataloging workflows, leading to faster and more accurate metadata generation.

Section 3: Power Apps as our solution for Retro-cataloguing in KBR

Automated Metadata Detection

At the Royal Library of Belgium, retro-cataloguing presents a particularly challenging task due to the vast number of books and patrimonial objects that have yet to be fully digitised and cataloged. With over 3 million of the library's 5 million books already included in the online catalog, there remains a significant backlog of historical materials that require detailed bibliographic records. To address this, the library developed a retro-cataloguing application using Power Apps and Power Automate, integrated with above-mentioned Document Processing AI-model, designed specifically for extracting metadata from paper documents. The workflow is straightforward yet highly effective: scanned images of title pages are uploaded to SharePoint, where an AI-powered flow is triggered via Power Automate. The AI model automatically detects key metadata such as the title, author, and publisher from these scans, which is then saved into Dataverse and visualised within the Power Apps interface. In the application a human cataloguer can select a record. Then the scan of the title page is viualized next to the detected metadata (title, subtitle, author, place of publication, publisher, year, edition statement). The cataloguer can then correct (if needed) and validate the record. The final step involves exporting the validated records into a CSV format, where it can be imported into our LMS.

Human Validation and Correction

Although the automation process significantly reduces the workload for librarians, we still chose to include the step of human validation in the workflow to ensure the quality of the cataloging data. Volunteers play an essential role in validating and correcting the automatically detected metadata. This project opened up opportunities for volunteers to engage with library work, contributing their time and expertise to refine the bibliographic records. The flexibility to incorporate human oversight allows libraries to maintain high standards of accuracy while still reaping the benefits of automation. By combining the strengths of AI with human expertise, libraries can create a more dynamic and efficient cataloging system.

Next Phase: Legal Deposit and Other Projects

Legal Deposit

In Belgium, legal deposit is the primary method of book acquisition. It's crucial to register incoming books promptly to confirm receipt to publishers and fulfill their legal obligations. To address this need, we have enhanced our application to handle not only older books but also new arrivals efficiently. Firstly, we added an AI model based on the colophon, because in contemporary books, most imported information is put in the colophon and not anymore on the title page. Secondly, -and this is one of the advantages of Power Automate flow- detected metadata can immediately be used in other processes, like HTTP queries. So, for example, if the AI-colophon model detects

an ISBN on the colophon, it can use that ISBN directly to search in other databases (using SRU queries) to see if they already have a record and if so, use that information to improve our own record. Thirdly, instead of using a CSV export, the application now sends the created record directly to our Library Management System (LMS) via FTP. As a result, just minutes after scanning, a record is created in our LMS, allowing publishers to see their deposited book online almost immediately. This tool is in production since September 2024 in KBR.

Other Projects

Periodicals

AI's role extends to the indexing of periodicals, where it can assist in article-level indexing. This application is particularly beneficial for school libraries and other institutions managing extensive collections of journals and magazines. By leveraging AI to identify and index individual articles, libraries can enhance the granularity of their catalogs, making it easier for users to locate specific articles and topics within periodicals.

Old Maps

We will use a model specifically trained based on old maps to detect the metadata of those documents. The model can analyze and extract metadata written on top or bottom of the map, like title, map number, producer, scale, coordinates, and so on. This information is put in an Excel database so that corrections can be done more easily in batch by the Map Department.

Handwritten library cards

We use the same workflow to detect the information on a collection of handwritten library cards that inventorize old prints and drawings. The model recognises and transcribes handwritten text. That way, the information is made accessible and searchable for researchers and historians.

As these technologies continue to evolve, their potential to transform library cataloging and metadata management grows. The integration of AI with platforms like Power Apps not only promises to streamline workflows but also to unlock new possibilities for managing diverse and complex collections. By embracing these advancements, libraries can stay at the forefront of innovation, ensuring that they meet the changing needs of their users while preserving and enhancing their valuable collections.

RDA Application Profiles and Validation

Resource Description and Access (RDA) is a framework for cataloging that provides guidelines for describing and accessing resources. It is essential in ensuring that bibliographic records are consistent, comprehensive, and useful across different

systems and institutions. In a test phase we now use Power Apps to create custom RDA Application Profiles tailored to our specific needs. The idea is that we use the form in Power Apps to select the elements we want to describe for each entity, together with the specifications like if the element is mandatory, repeatable, if it is unstructured/ structured/with identifier/with IRI, if it is linked to a vocabulary, and so on. But the most important feature of this app is that is also creates a file that can be used to validate our records, to control if they fit the definition of the Application Profile. For that, we need to take a look at Shacl4Bib and QA Catalog.

Shacl4Bib, QA Catalogue and Custom Validation

The Shapes Constraint Language (SHACL) is a formal language for validating RDF graphs against a set of conditions. Following this idea and implementing a subset of the language, the Metadata Quality Assessment Framework provides Shacl4Bib: a mechanism to define SHACL-like rules for data sources in non-RDF based formats, such as XML, CSV and JSON. QA catalogue extends this concept further to MARC21, UNIMARC and PICA. The criteria can be defined either with YAML or JSON configuration files or with Java code. Libraries can validate their data against criteria expressed in a unified language, that improves the clarity and the reusability of custom validation processes[3].

QA Catalogue is a metadata quality assessment tool designed for evaluating library catalog records[4]. At KBR, with a catalog encompassing approximately 4.7 million title descriptions—many of which originate from older catalogs or retro-cataloguing projects—we face considerable challenges in data cleanup and enrichment.

To address these challenges, we employ QA Catalogue, an open-source tool that helps us assess and improve our records. This tool ensures that our data complies with MARC21 standards by identifying and rectifying issues such as invalid codes, incorrect values, obsolete codes, undefined fields, and the repetition of non-repeatable fields. This process is crucial for maintaining the accuracy and reliability of our records.

Additionally, we have integrated the new feature in QA Catalogue that allows custom validation using Shacl4Bib. By creating a tailored Application Profile in Power Apps, we translate these profiles into rules and specifications, formulated in the YAML language. This file we can upload and it is used to check the records against those rules. The result is put in the QA Catalogue dashboard where we can see how many records do not fit the rules (with the possibility in downloading the identifiers of those incorrect records)[5].

Although this project is still in the testing phase, it highlights the significant impact of Power Apps and demonstrates its potential to enhance various projects and processes at KBR.

Conclusion

The integration of Power Apps and AI into cataloging processes offers significant benefits, transforming the way libraries manage their vast collections. By automating repetitive tasks, such as metadata extraction and classification, these technologies enhance efficiency, accuracy, and consistency in cataloging. Power Apps provides a customizable platform for creating tailored applications that fit the unique needs of each institution, while AI models offer advanced capabilities for processing and enriching metadata. Together, they streamline workflows, improve data quality, and enable librarians to focus on more strategic tasks.

Looking ahead, the potential for further developments in AI and automation is substantial. As these technologies continue to evolve, they will likely offer even more sophisticated tools for metadata management, further reducing manual effort and improving data integration. The evolving role of technology promises to make cataloging more dynamic and responsive to the changing needs of libraries and their patrons.

Metadata specialists and librarians are encouraged to consider adopting these innovative tools to enhance their cataloging processes. By embracing Power Apps and AI, or similar tools, libraries can achieve greater operational efficiency and better serve their users. That is why we invite readers to stay informed about future advancements in AI and library automation. Embracing these technologies can significantly improve cataloging workflows and contribute to more effective metadata management.

References

[1] Microsoft (2024) *Overview of the category classification custom model*. Available at:https://learn.microsoft.com/en-us/ai-builder/text-classification-overview

[2] National Library of Finland (2020-) *Annif*. Available at: https://annif.org/. See also Osma Suominen, O., Koskenniemi, I. (2022) 'Annif Analyzer Shootout: Comparing text lemmatization methods for automated subject indexing', *Code4Lib Journal*, 2022-08-29 (issue 54). Available at: https://journal.code4lib.org/articles/16719

[3] Király, P. (2024) *Shacl4Bib: custom validation of library data*. Available at: https://doi.org/10.48550/arXiv.2405.09177

[4] Király, P. (2024) *qa-catalogue* (0.7.0). Available at: https://github.com/pkiraly/qa-catalogue

[5] https://qa-data.kbr.be./?tab=shacl&lang=en&groupId=0

Metadata & Discovery Group

Problem Classmarks

Solution to the bespoke classification scheme at the University of Sussex Library

Sean Goddard 0000-0003-4500-2272
Collection Services Librarian, University of Sussex Library

Daisy Phipps 0009-0001-4059-5614
Assistant Library Officer, University of Sussex Library

Received: 20 Sept 2024 | Published: 16 Dec 2024

ABSTRACT

The library of the University of Sussex uses a modified version of the Library of Congress Classification (LC) to shelf its collection in the public reading rooms. For some subjects entirely in-house schemes were designed using the same first-level class letter(s) as LC. These modifications are now problematic and neccesitated a large scale reclassification to standard LC. This article describes the methodologies and workflows employed to reclassify and merge approximately 57,500 books between 2017 and 2023.

KEYWORDS reclassification; Library of Congress Classification; book move; bespoke classification

CONTACT Sean Goddard s.p.goddard@sussex.ac.uk University of Sussex Library
Daisy Phipps d.phipps@sussex.ac.uk University of Sussex Library

Introduction

The University of Sussex was founded in 1961. The library building opened in 1964 and within the first three years of operation had a collection of 80,000 volumes, increased to 250,000 within ten years of opening. Book acquisition included significant gift book collections from individuals (Daiches, 1970: 9, 158, 160-161; Inglis, 2011:75).

Librarians originally adopted the Library of Congress classification scheme (LC) and then librarians devised their own modified LC for certain subjects (Daiches, 1970:158; Goddard and Haillay, 2017:21). For some subjects, wholly in-house schemes were designed using the same first-level class letter as LC. For example, English Literature was assigned PF and based on the date of birth of the author:

William Blake (1757-1827) = PF 75700/04
Oscar Wilde (1854-1900) = PF 85400/01
Mervyn Peake (1911-1968) = PF 91107 (see Figure 1 and 2)

Hillary Mantel (1952 -) = PF 95218
Linton Kwesi Johnson (1952 -) = PF 95219

As Goddard and Haillay have explained, for authors born post-2000, this system fails without modification (2017:21). It was thus decided a reclassification project was required to conform to LC. In 2017, the University of Sussex Library reclassified and moved approximately 10,500 German and Scandinavian literature books from PK to PT; in 2019, we reclassified and moved 12,000 American Literature books from PH to PS. In 2023, we reclassified the 25,000 books contained in the English Literature collection in classmark PF and merged it with the 10,000 items in PR. This move-and-merge is the subject of this article.

Figure 1: Mervyn Peake original PF classmark

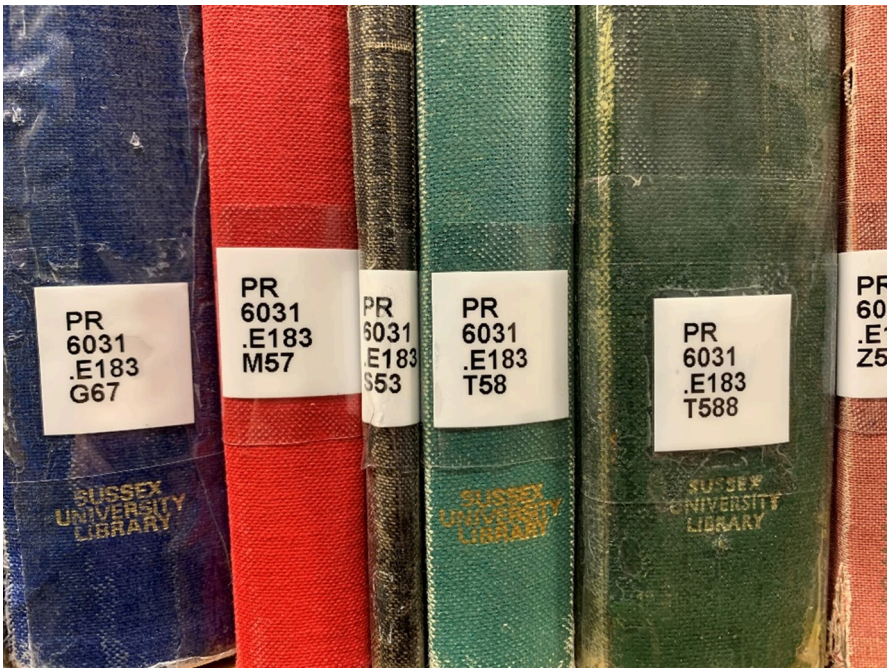

Figure 2: Mervyn Peake new PR classmark

Following recent email exchanges with retired staff, it has been established that when the Library was founded, it did implement English Literature LC correctly, and then moved to the in-house, improved, classmark scheme including English Literature. As Adrian Peasgood and Cherry Horwill suggest:

> Adrian [Peasgood, started Aug 1962] used LC's PR for the first few months of his appointment, and this made him think we could do better for our readers. He got an OK to create PF, assuring Alec Blamire (then i/c cat'n'class) that it would contain capacity for everything in LC's PR. Overseas Englishes were to be accommodated in PF extended by a range of third letter extensions. This certainly happened for a while, until, we think as part of one of the initial abortive reclassification schemes for the literatures (? by the mid-1980s), LC's PR was used for the overseas Englishes. (Horwill and Peasgood, 2023).

Literature Review

Before we started the project, we considered what other libraries had accomplished and the challenges of managing a large-scale move of our Literature collection. Libraries move books for a variety of reasons, and as Atkins and Teper (2011:60-61) suggest, this could be a temporary or permanent move. The type of book move required will determine its particular characteristics; however, there are many common factors. For example, Atikin and Teper (2011:74) identify thorough planning as essential; Meltzer (1993:559) suggests communication with users and staff is crucial; and Weaver and Stanning (2002:68) suggests that advance and after-completion publicity is a priority. A timeline of start, finish and other milestone achievements can also help (Atkins and Teper, 2011:76). Exactly when to move is also a consideration for academic libraries: Cash (2001:18-19) identifies the summer vacation as the ideal time, noting, however, that this may depend on local circumstances. Likewise, there is discussion about the best use of staff and whether using library or temporary staff is appropriate (Cash, 2001:23; Guimaraes and Collins 2018: 229).

In the University of Sussex Library's case, we reclassified and merged two classmark sections together. Goddard and Haillay (2017:21, 25) have explained that when the library was set up in the 1960s, although the Library of Congress scheme was used, there was much deviation, and correction is now taking place to conform to a recognised cataloguing standard. Using external sources such as Classification Web (Goddard and Haillay, 2017:22) to create classmarks can prove invaluable. As many classmark ranges need to be corrected, this will take many years. Webster and Faulkner recommend (2022:106, 109) that a spreadsheet of affected books should be created to facilitate the creation of the new classmarks. At the same time, good practice suggests any catalogue record can be updated (Webster and Faulkner, 2022:106) using WorldCat to improve discovery.

As Spalding (2011:42) suggests, before commencing with any move, communication to both staff and library users is vital. Using understandable terminology wherever

possible, notices and other relevant communications should be used, referring users to ask staff if they have any questions.

Reviewing the literature reveals a contentious area: access to items being moved. If the move is small, and staff can readily access the stock, Weaver and Stanning (2002:68) suggest books can be collected by a member of library staff. Meltzer (1993:559) goes further and suggests that to maintain a reliable service, collections should take place at specific times.

Cash (2001:24) recognises that the longer and larger the move, the more difficult and frustrating it becomes to maintain an on-going collection.

Atkins and Teper (2011:62, 70) and Cash (2001:23) have stressed the importance of keeping books in order. Adequate space must be made available for books to be stored in their new or temporary location, and if moving to a permanent location, space must be allocated for growth (Lambert, 2022:171). Many authors (Cash, 2001:20-21; Lambert, 2022:173) suggest measuring exact lengths to identify where specific books will sit or establishing waypoints to identify an immediate area (Lindsay, 2017:50; Lambert 2022:169). Cash (2001:21) identifies human error as a potential problem: humans may continually overshelve by an inch (25mm) leading to a cumulative loss of space. Lindsay (2017:53-54) recommends leaving space for interfiling returned items and cleaning the shelves. Cash (2001:22), further suggests it is good practice to avoid inconvenient classmark breaks. However, as Spalding (2011:42-43) outlines, book moving can be physically demanding, and so setting achievable targets is essential.

The use of planning apps, or at least a Gantt chart, should be considered. Goddard and Haillay (2017:25), while rectifying previous librarians' decisions, have identified a suitable order for reclassifying books to ensure the number of times books are moved is reduced. They further recommend (2017:22) that any movement of books relating to reclassification should not start until the allocation of new classmarks for a particular section has been completed.

Many authors consider the various contributions of staff. Goddard and Haillay (2017:24) identify there should be a clear line of management, supervision, and support. Spalding (2011:43) supports this idea, and further suggests that there is a need to set targets to maintain momentum, and that staff should have suitable areas to work. Guimaraes and Collins (2018:231) observe that for keeping staff up to date with progress, targets, and other essential information such as changes to procedures, regular stand-up scrums or meetings are essential. There is a need to consider whether the identified work should be undertaken by specific library or temporary staff. Goddard and Haillay (2017:22-24) suggest allocating new classmarks to books should be done by trained cataloguing staff, while the practical changing classmarks on the library's management system, putting new labels on, and book moving could be done by temporary staff after training. Goddard and Haillay (2017:24) further recognise that once staff are familiar with the processes, they speed up.

Guimaraes and Collins (2018:231) highlight a possible problem when undertaking the practical process of reclassifying of a book. For whatever reason, there will be books which do not appear on the spreadsheet or do not have a matching bibliographic record. These need to be sent to a cataloguer for processing. Facilities, such as trolleys, should be made available in the workspace.

Cash (2001:25) recommends ensuring the equipment you intend to use is adequate. If you are using trolleys to move books, are they appropriate, and do you have enough? Spalding (2011:42) further underlines the importance of possessing enough spine labels for relabelling each book and Guimaraes and Collins (2018:230) recommend ensuring there are also enough computers, label printers and other miscellaneous accessories.

It is unusual for projects to run without issue and there will often be delays due to unforeseen complications (Meltzer: 1993:560), as Atkins and Teper (2011:62) suggest lift breakdowns are one possible cause of significant delays if you are moving books to other floors. The management and planning of any book moving project needs to be flexible and allow for midstream adjustments if necessary (Webster and Faulkner, 2022:110).

Writing in 2011, Atkins and Teper (2011:61) suggest there is limited literature in this area. Further research is required here.

Methodology

In June and July of 2023, we undertook a reclassification of our English Literature collection. This involved 25,000 books classed as PF under the University of Sussex classification system (UoS) which needed to be merged with 10,000 books classed as PR under the Library of Congress classification system (LC).

To achieve this, we broke the project down into the following steps:

Stage 1. Reclassify the books in PF
Stage 2. Preparation for the project
Stage 3. Move the PR books (temporary staff start)
Stage 4. Flip the classmarks of the PF→PR books and interfile with PR books
Stage 5. Move PG-PQ round to combine the space for the new PR
Stage 6. Return the new PR books to the open shelves (temporary staff end)
Stage 7. Check and fix any snagging issues

Stage 1: Reclassifying the books in PF

All books in the PF classmark had to be reclassified to LC. The majority were reclassified to PR (PF→PR); however, a small number of books (less than 1000) were reclassified to other classmark's (PF→Other).

To do the reclassification, a list of all the books in PF was created on ALMA, the Library's management system. All the books on this list were given a new LC classmark by colleagues in Cataloguing, the records were updated but the new classmark was not shared publicly. Two new lists were then created. A list of PF→PR; and a list of PF→Other. These lists were then passed to the Collection Services.

Collection Services combined the list of PF→PR with the list of books already in PR, colour coding the two types of books. The list was then organised into PR classmark order. This allowed us to see where large amounts of space would be needed for PF→PR to be interfiled, once the classmarks had been flipped.

Stage 2: Preparation for the Project

Two small tests of the workflow were undertaken as part of the planning stage. These involved the PF→Other books, and a small selection of PF→PR books (Irish, Scottish, and Welsh literature). We were testing the moving, merging, and flipping of the books, to get a better understanding of the resources and manpower we would require. Library staff conducted these tests of workflow.

Once the workflow had been tested, we needed to measure the length of the shelves in PR and in PF to determine the space needed for the merger. To do this, we respaced PF and PR so that the shelves had an equal length of books on them. We multiplied this number by the number of shelves, which gave us the meterage. The meterage was used to inform the amount of shelving we would need in stage 3-4. This also meant that we could set accurate targets for the workers during the project.

We also had to look at several key factors of the project before stages 3-6. Those questions included (1) who was going to do the work, (2) where would the work be done, and (3) what equipment and software would be needed.

1. Who would be doing the work was debated extensively. An early proposal recommended a larger involvement of Library staff; however, we ultimately decided to use temporary staff to work on the project. This was decided based on factors such as disruption to Library workflow, budgetary constraints, and effectiveness of using temporary staff over Library staff.

   There was already a precedent in place for hiring temporary staff for summer projects, and a similar method was applied to this project. Hiring of the temporary staff members began in April 2023. Applicants were invited to apply by email which included information of the summer project's start date and a brief description of the type of work. They were informed that they needed to send in a CV to be considered. A few former temporary staff also contacted us asking for summer employment and we were happy to accept their applications. Hiring was done at the discretion of the Collection Services Librarian and the Shelving Supervisor. We were looking for trustworthy individuals with the ability to work unsupervised in small groups who would be committed to the project. In the end we had ten staff

members, with one replacing another in the middle of the project, and one who worked part time. A third-party agency was used to facilitate the hiring process for the temporary staff.

2. It was determined before the project began that a space would be needed to store the books once they had been reclassified, and before they went back onto the open shelves. The original area identified was a recently renovated rolling stack bookstore, known as the BLDS Basement named after the British Library of Development Studies. The BLDS Basement needed to be prepared in the weeks leading up to the start of the project; a large book move commenced to consolidate the space available as it was being used as a transitional journal store. Once the book move was completed, we measured the space available in metres and compare that to the meterage of PF. From this it was determined that the BLDS Basement alone would not be large enough. Fortunately, a second location was found within the Library's North Basement (for those unfamiliar with the University of Sussex Library, the North Basement is on a different floor to the BLDS Basement). Neither basement was large enough on its own to store the books being reclassified.

   A space was also required to do the reclassification. There was no suitable location within Library staff areas, so a study space was requisitioned for the duration of the project. The room we settled on was deemed suitable as it had the necessary computers. It was also adjacent to the BLDS Basement where most of the books would be stored, and within a few metres of the lift to the North Basement where the remaining books were stored. Furthermore, the area could be closed off from the main Library without causing any major disruption to the students, which meant that the workers had a quiet space for their use. This allowed us a certain amount of flexibility and leeway in our actions as we could

Figure 3: A workstation with equipment

contain any chaos within designated workstations (see Figure 3) and there was never a risk of us getting in the way of the wider Library.

3. There were several pieces of equipment and software that needed to be acquired before the start of the project. Two of the key pieces of physical equipment required were P-touch labelling machines, and barcode scanners. We had two P-touch labelling machines already; however, we required more so two extras were purchased. These were slightly updated versions, but they worked on the same software. Barcode scanners we had in abundance, however many of them had to be reprogrammed so that they would function in the necessary way.

The move was always planned to take place during the summer holidays. This was the usual time for us, Collections Services, to run large projects as to limit disruption to the Library users. This was especially important as the Library remained open for the duration of the project.

Stage 3: Move the PR books into the basement.

The temporary staff arrived to help from this stage of the project. The first stage they were involved in was moving the 10,000 PR books from the open Library shelves to the BLDS Basement and the North Basement. For ease we had two teams working at either end of the classmark, moving towards each other. This approach was taken as space was limited in both basements predominantly because they both use rolling stacks. By having two teams we increased the speed at which the books were moved.

Gap-identifiers (see Figure 4) had been placed periodically in the shelves to signpost where space (multiple shelves) would need to left empty for PF books to be slotted in, this was done using the spreadsheet of PF→PR.

Figure 4: Gap identifiers

Stage 4: Flip the classmarks of the PF→PR books and interfile with PR books

Once they had finished moving the PR books off the open shelves and into the two basements, we began flipping the classmarks. This was the most labour-intensive part of the project, and we had estimated it would take 8 weeks to complete.

The temporary workers would remove a trolley of books from the shelves in PF classmark order, flip the classmarks, relabel the books and then place them on a new trolley in PR classmark order. Once all the books on a trolley had been processed, they would be shelved in the basements in new classmark order (see Figure 5 and 7). Range guides were placed on both basement doors to indicate the range of PR which were stored there. We also placed range guides as shelving aids (see Figure 6) on the end of each row of the rolling stack.

Books which couldn't be processed correctly, were placed on the 'trolley of shame' to be processed by a specially trained temporary staff member (who worked part time and was paid at a higher grade), or to be passed back to the cataloguing team. All temporary staff members were trained in a few common errors to stop a backlog occurring. These books once processed would then be shelved in the basements in new classmark order.

A collection service also operated during this period. Any student who wished to borrow a PR book were directed to the Library Service Desk, where a staff member would add the details of their request to the list. The list was checked twice a day by collections staff who would collect the books from the necessary store and place a request on them for the students. The students would then receive an email stating that they could collect the book from the Library during opening hours. The books in PF remained available to users on the open shelves for the duration of the project.

Figure 5: Books waiting to be shelved

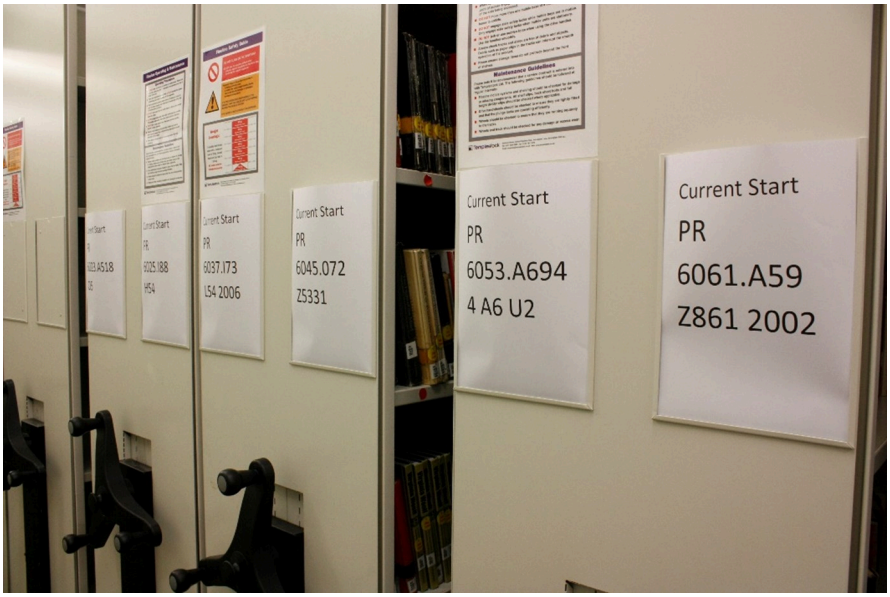

Figure 6: Shelving aids

Stage 5: Move PG-PQ round to combine the space for the new PR

Before we could move the new PR books back onto the open shelves, all the books between PF and PR had to be moved round and squidged up, to create enough space in the correct location. Therefore, a week before the end of the flipping several workers were reassigned to moving books. The move of books was planned to take a period of 2 weeks, a timeframe we based on several previous book moves we had conducted. Once all the temporary workers had been reassigned, they were staggered strategically throughout the shelves to ensure that they were not on top of each other.

We also took this opportunity to clean the empty shelves prior to the book move.

Stage 6: Return the new PR books to the open shelves (temporary staff leave)

The move of PR books out from the BLDS and North basements was planned to take less than a week, as all the books were in the correct order. The temporary workers filled trolleys with shelves of books, the trolleys were numbered, and other temporary workers would then shelve them. This was done in two teams with one team working from the BLDS Basement going forward, and the other team working from the North Basement going backwards.

Stage 7: Check and fix any snagging issues

When the move was finished (end of July) the temporary staff's contracts ended. After this we planned to check for any snagging issues. This was done with a series of shelf checks looking specifically for any shelving or labelling errors. We also added new range guides.

A smaller reclassification took place after the project, these were German Literature books in PJ-PK which had to be reclassified to PF. This was undertaken by the Library's shelving team in September. To prevent a further move later the PJ-PK books were

Figure 7: Temporary workers shelving

moved to their new location before being flipped and relabelled. This meant that the sequence went, PE, PJ, PK, PG for several months, but as there were few students around during the summer, this was deemed an acceptable disruption.

Discussion

Preparation for this reclassification project started before Covid with the intention of undertaking the work in 2020, this was delayed, and the project took place in the summer of 2023. This is a two-section project: classmarks are assigned by the Cataloguing Section (a sub-section of Content Delivery), and the more practical elements, such as moving books, flipping classmarks, and spine labelling by Collection

Services (a sub-section of Collections). It is important to note that, although the project only took eight weeks to complete, the reclassification process took much longer. Several years to create new LC classmarks for every book and add them to the records. This was primarily because this was done in-house. It is possible to farm this work out, but this would have been at a high financial cost and there are always local variations to the LC classmark. The successful collaboration between the Collection Services team and the Cataloguing team was a triumph of the project. It was particularly helpful that one member of the reclassification team project team, the Shelving Supervisor, is a member of both teams.

After reviewing the literature, and using the library's past experience of previous projects, we decided to start removing books at the beginning of Classmark PF and work through in classmark order. This ensured every book on the shelves were reviewed and re-classified, and any items not reclassified, such as those on loan or missing at the end of the project had a Work Order placed on them. We did not recall any items. We thought about picking books off in the new PR order, but we felt this system would be more time-consuming and potentially leave significant items to process at the end of the project.

Communication was top of our priorities. Library users were informed what was happening and why, and the expected timescales were communicated using the Library's normal communication channels. The temporary staff were fully briefed about the project in case they were asked by Library users when collecting books. In addition, the managers of the project met regularly (a stand-up scrum) with the temporary staff at least once a week to update them on progress, and the managers welcomed their feedback and ideas.

The PF book spreadsheet used was produced in 2018, primarily for re-classification purposes. It did not contain any books purchased after this date as the new classification would have been added to the record during the initial classification process. For reclassification purposes, this did not matter as we were not working directly from the spreadsheet. Allowances were made in the spacing for these additional books.

Prior to the reclassification project starting, two small workflow tests were undertaken. These ensured our processes, workflows, suggested timings and training documents were satisfactory. We used a selection of library staff who had not been involved in any earlier library reclassification activity as testers.

We were able to undertake the main project during the University's Summer Vacation, when demands on books and Library resources are reduced. After the first week, all PR books were only accessible via a collection service, while the PFs were accessible on the main shelves until they were taken for reclassification, after which they were only available via the collection services. Items were retrieved twice a day,

and then available via the library's request system. If books were required urgently, retrieval was done on demand. This worked well.

The project got off to a slow start, as the BLDS Basement where some of the items were to be stored was initially unavailable due to the overrunning of an earlier project. This caused the initial transfer of PR books to be delayed. Likewise using temporary staff who had to be registered with the University's IT service to allow access to the Library Management System took a day or two longer to complete. In hindsight, it would have better to have registered staff earlier (the previous week); however, as the logins has to be collected in person, this was not possible. This was the first-time summer temporary staff had required IT accounts.

The current PR books were moved first. Using the spreadsheet, gap-identifiers were placed in the PR sequence where significant space was required for re-classified PR books. In many cases, large gaps were required, some more than twenty shelves. We allowed for twenty-five books on each shelf, this included an allowance of three books for recent purchases. In the basements, shelves had waypoint notices attached to every three bays, and the PR books subsequently were moved. As there were two different locations for storing reclassified books, there had to be a break in the sequence, and this was set at PR 6023.A518 O3. A more suitable classmark would have been at the change in a whole numbers, such as PR 6023 or PR 6024. This could have been used but these were several shelves away. The move of PR went well.

The temporary staff were formed into five groups of two. Anticipated reclassification targets were given (eight trolley shelves a day per team, 7.2m or 330 books a day), and a rota for reshelving reclassified books. Each team collected books, reclassified them, and put them on a trolley in classmark order; these trolleys were then numbered for reshelving, and the books then reshelved by the rota. As some sections had many books by the same author, such as Virginia Woolf, Charles Dickens and William Shakespeare, we anticipated shelving in trolley order would ensure works by the same author would be re-shelved at the same time. It did and this helped space management. However, there were space issues. Although we had placed waypoint notices every three bays, re-shelvers placed books close together rather than spreading them out over the three bays. Initially this required additional book moving to take place to ensure there was adequate space. Being flexible, waypoint signs were then put on each bay. Shelving was awkward: not only were there two locations, but locations had rolling stacks which meant there was a limited amount of space, as aisles could only be used one at a time and only two members of staff could fit down an aisle. As expected, the lift broke down, and we switched to the pre-planned longer route to the basement. This delayed some books being reshelved at the end of the project.

The flipping of classmarks and relabelling went largely without problems. Initially, some barcode scanners did not work and there were some issues with spine-labeller software settings. As anticipated, very soon after starting, the staff became very familiar with all the process and sped up.

A ‘trolley of shame’ was used from the start. All temporary staff were trained on resolving minor issues, and if this was not possible, they were placed on the trolley-of-shame, named by a member of the project staff. A member of the library’s shelving team was additionally trained to triage additional problems, such as books recorded as missing, withdrawn, or books which had not been allocated a new classification number. Liaison between this member of staff and the Shelving Supervisor was paramount and between them they were able to resolve 90% of the problems, without referring to the Cataloguing Section which sped up the process. This member of staff was paid at a higher grade.

We were concerned about staff motivation as we recognised the job was potentially tedious and repetitive. During the summer, the Library and University has various staff activities which we ensured they could take part in. For example, the library had various socials (coffee or lunchtime events which included cake), while the University held their Professional Services Day, which included talks, presentations, and a free lunch. Towards the end of the project, and before the re-classified books were returned, all the shelves were cleaned. One Friday afternoon, at 1pm, each group was allocated a section of shelves to clean. Once done, they could go home early: you’ve never seen such fast cleaning!

The team we had was excellent and we had complete trust in them to know what they were doing and mature enough to carry on without supervision.

Future Reclassifications

Although the library’s Literature collections have now been reclassified to the LC scheme, there is still much reclassification to be completed. Currently, we are reclassifying QD (Sussex’s bespoke Mathematics' classification to LC QA) and the reclassification flip is likely to take place in summer 2025. We are then looking well ahead to reclassify the whole of H and J classmarks: Politics, Economics and Sociology etc.; in excess of 100,000 items.

Even though this project was wrestling with the legacy of questionable decisions, by some of our early librarians, it has felt hugely rewarding to correct some long-standing issues.

References

Atkins, S. and Teper, J. 2008. ‘A Survey of Library Practices in Planning and Managing Temporary Moves’, *Collection Management* 30 (4), pp 59-84.

Cash, D. 2001. ‘Moving a Library Collection’, *Public Library Quarterly*, 20 (4), pp. 17-28. Available at: https://doi-org.sussex.idm.oclc.org/10.1300/J118v20n04_03 (Accessed: 18 September 2024).

Daiches, D. 1970. The Idea of a New University: An Experiment in Sussex. 2nd ed. London: André Deutsch.

Goddard, S. and Haillay, T. 2017. 'Reclassification of University of Sussex Library Local Language and Literature Classes to Library of Congress', *Catalogue and Index*, 188, pp. 21-26. Available at: https://cdn.ymaws.com/www.cilip.org.uk/resource/collection/F71F19C3-49CF-462D-8165-B07967EE07F0/catalogue_and_index_issue_188_september_2017.pdf (Accessed 18 September 2024).

Guimaraes, A. and Collins, J. 2018. 'How to Move a Mountain: The Preparation and Transfer of One Million Volumes to an Off-site Storage Facility', *The Serials Librarian*, 74 (1-4), pp. 228-233. Available at: https://doi.org/10.1080/0361526X.2018.1428476 (Accessed: 18 September 2024).

Horwill, C., and Peasgood, A. 2023. Email to Sean Goddard, 4 December.

Inglis, K. 2011. 'The Library', in Gray, F. (ed) *Making the Future: a History of the University of Sussex*, Brighton: University of Sussex.

Lambert, J. 2022. 'Evidence-based Library Book Shifting', *Journal of Access Services*, 19 (4), pp. 167-178. Available at: https://doi.org/10.1080/15367967.2023.2172416 (Accessed: 18 September 2024).

Lindsay, B. 2017. 'Moving the New York University Abu Dhabi Library', *Collection Management*, 42 (1), pp. 48-56. Available at: https://doi.org/10.1080/01462679.2016.1264900 Accessed: 18 September 2024).

Meltzer, E. 1993. 'Successfully Moving the Library – Temporarily'. *College and Research Libraries News*, 54 (10), pp. 557-560. Available at: https://doi.org/10.5860/crln.54.10.557 (Accessed: 18 September 2024).

Spalding, A. 2011. 'Changing Places: Some Practical Outcomes from a Reclassification Project Using DDC22', *Art Libraries Journal*, 36 (4), pp. 41-43. Available at https://doi.org/10.5860/crin.54.10.557 (Accessed: 18 September 2024).

Weaver, M. and Stanning, M. 'Reclassification Project at St Martin's College: a Case Study', *Library Review*, 56 (1), pp. 61-72. Available at: https://doi.10.1108/00242530710722023 (Accessed: 18 September 2024).

Webster, E. and Faulkner, A. 2022. 'Case Study: Reclassifying a Children's and Young Adult Literature Collection', *Collection Management*, 47 (2-3), pp. 101-110. Available at: https://doi.org/10.1080/01462679.2022.2030839 (Accessed: 24 September 2024).

Catalogue & Index | Issue 209 (2024)

Metadata & Discovery Group

Enhancing the Oxford University Research Archive

compliance, consistency, and challenges in supporting researchers

Tom Mitchell 0009-0007-5451-0486
Open Access and Repository Supervisor, Bodleian Libraries, University of Oxford

Tuula Lindgren 0009-0001-7105-7819
Open Access and Repository Supervisor, Bodleian Libraries, University of Oxford

Jason Partridge 0000-0001-9819-9991
Open Access Service Manager, Bodleian Libraries, University of Oxford

Received: 27 Nov 2024 | Published: 16 Dec 2024

ABSTRACT

This paper examines recent developments made to the Oxford University Research Archive (ORA), which has been in place as the University of Oxford's institutional repository, supporting Oxford researchers, since 2007. Over the past four to five years, ORA has undergone significant updates, including the implementation of a new data model, the adoption of enhanced metadata standards, and the integration of automation tools. These changes have streamlined workflows for repository staff by reducing manual tasks, improving metadata consistency, and ensuring compliance with both institutional and external policies, thereby benefiting both researchers and repository administrators. The paper concludes by exploring potential future directions for the continued development of ORA in alignment with emerging researcher needs and policy landscapes.

KEYWORDS institutional repository; metadata standards; metadata enhancement; data model; automation; open access; policy compliance; system development

CONTACT Jason Partridge jason.partridge@bodleian.ox.ac.uk Bodleian Libraries

Introduction

The Oxford University Research Archive (ORA) has served as the University of Oxford's institutional repository since 2007[1]. In this role, it supports researchers to ensure the widest possible access to research outputs including publications (e.g. journal articles, book sections, reports), research theses and data, and so-called grey literature (e.g. working and discussion papers), in line with institutional objectives. ORA has gone through several interfaces and systems and, as such, several significant changes to the processes by which research objects are created, added, and enhanced. In 2020, ORA systems moved from a workflow of editing raw XML code (using MODS

[1] https://ora.ox.ac.uk/about

metadata schema) to a form-based entry interface, encompassing the use of richer standards, controlled vocabularies, and identifiers. Additionally, a 22-month project was completed in September 2024, delivering over 100 improvements across 10 milestones, impacting on repository workflows in the processing and sharing of deposited research.

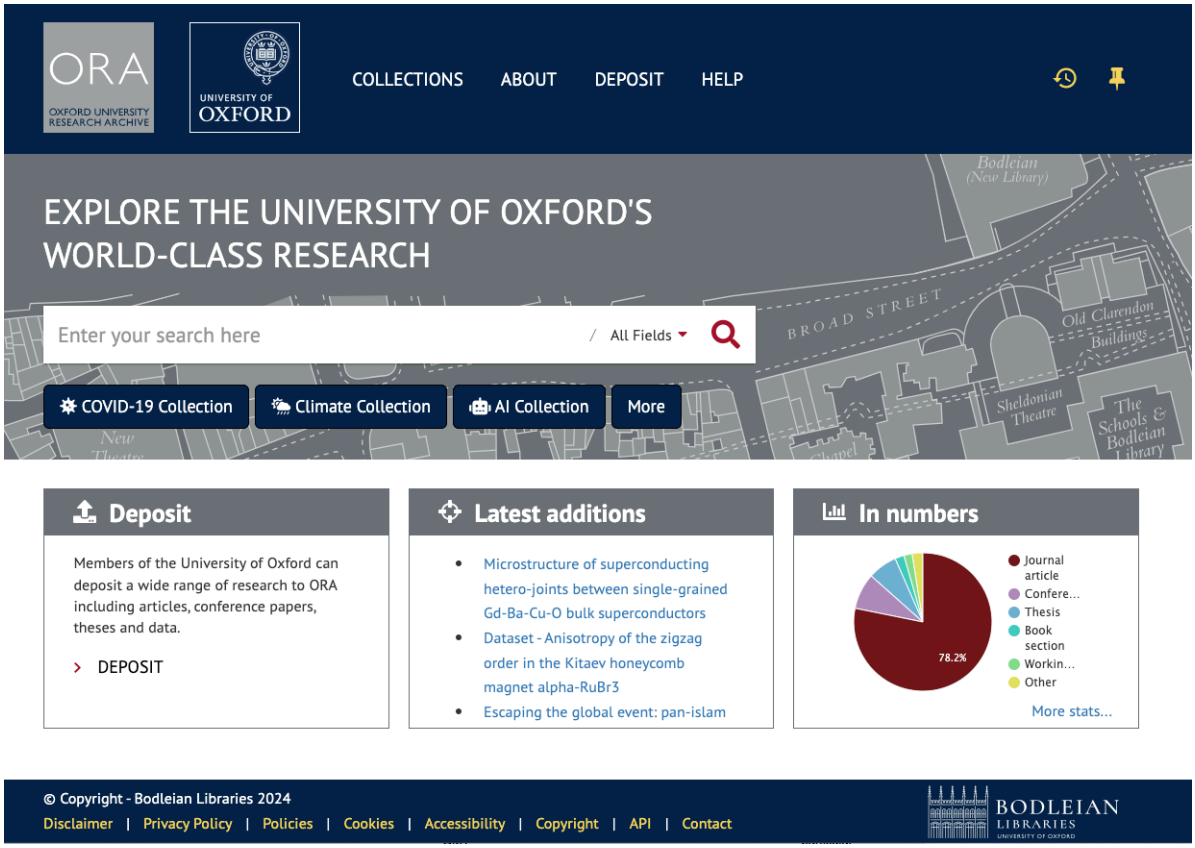

Figure1: The public homepage for the Oxford University Research Archive (ORA)

Repository and metadata management literature details the importance of good quality descriptive metadata in the discoverability of research, aiding visibility (Yang, 2016), indexing (Chiu, Chen and Cline, 2023; Editage Insights, 2024), citation, understandability, and reuse (Kemp, Dean and Chodacki, 2018). It also plays an important role in archiving and digital preservation (Digital Preservation Coalition, n.d.; Płoszajski, 2017). The importance of good quality descriptive metadata has also been highlighted in funder policy (Coalition S (n.d.); UK Research and Innovation (UKRI) (2022)), which often points to specific metadata standards or principles such as FAIR (GO FAIR (n.d.)), and is supported by institutional statements surrounding the access and longevity of research (University of Cambridge (n.d.)) A key role for ORA, therefore, is to ensure that metadata describing Oxford research to both humans using the public interface and machines using ORA's application programming interface (API) is of high quality. These goals were key to the recent improvements to ORA's 'review' system.

ORA metadata review process, checking, enhancing information

While aiming for high quality metadata, ORA also seeks to make depositing research outputs as easy as possible for researchers, understanding the pressures which already exist on their time. Most item types are deposited via Symplectic Elements (Elements)[2] and require only minimal manual entry of data for authors or a departmental administrator depositing on their behalf. Additional 'optional' fields are available for the depositor to add more information should they desire. If a paper is already published and available on a publisher website or through a source such as CrossREF[3], then Elements can collect metadata about the publication and present it to Oxford users - matching to an author based on criteria such as name, email address, or ORCID. Within the Elements interface authors may then only need to "claim" an output and attach a file to send it to ORA. Theses and datasets require slightly more effort upon deposit, as ORA registers DataCite[4] Digital Object Identifiers (DOIs) for these items, and both repository staff and creators must be happy that metadata is correct before this can be done. Nonetheless, every effort is made to reduce the burden on depositors.

The job of checking the items deposited to ORA, correcting, and enhancing the metadata describing research outputs, is that of the repository's review staff. Their role is to ensure all currently available bibliographic information (such as acceptance date, volume number, abstract, etc.) is added to a record before making it publicly available (often requiring further "check backs" to add information not yet available at time of first review). The review process takes place within the ORA review interface, built using Samvera open-source software called Hyrax. This has been developed as a tabbed set of review 'steps' within a form to allow the enhancement of metadata and description of files – a task previously done by editing XML code directly.

Whilst the previous method of editing XML for ORA records provided staff with flexibility in metadata creation, this left more room for error and for deviation in the standard of review or presentation of content. The current review interface allows for more conformity in review and the establishment of a shared standard that can be checked and measured within the team.

ORA Data Model

The underlying guiding structure to ensure consistency and control in the reviewing process is the ORA Data Model[5]. The data model manages the field structure and value entry for the ORA review interface, but is also applied to the ORA public interface, the repository storage layer, and API output, allowing for uniformity and alignment of the model across the whole ORA system.

[2] https://www.symplectic.co.uk/theelementsplatform/
[3] https://www.crossref.org/
[4] https://datacite.org/
[5] http://dx.doi.org/10.5287/bodleian:pr22x1bjE

For the purposes of the review interface this means that metadata fields such as title, contributors (authors, etc.), host title (such as journal title or book title), and dates (such as copyright year) are consistently labelled, ensuring that citation references can be built for each repository object in consistent formats and styles across various item types (journal article, conference paper, etc.).

The Data Model also allows for controlled vocabularies to be used to ensure that naming and terminology is uniform, for example for fields such as peer review status (Peer Reviewed, Reviewed Other, Not Reviewed), or re-use licence (CC-BY, CC-BY-ND-NC, etc.).

Where available, the Data Model utilises metadata frameworks or identifiers as lookups for value standards. An example of this is in the look-up of subjects to the FAST schema[6] or in funder names - using Research Organization Registry (RoR)[7] identifiers. It also implements ISO standards, such as ISO 639[8] for language codes (e.g. eng, English) and ISO 8601 for dates[9] (YYYY-MM-DD), promoting consistency across records.

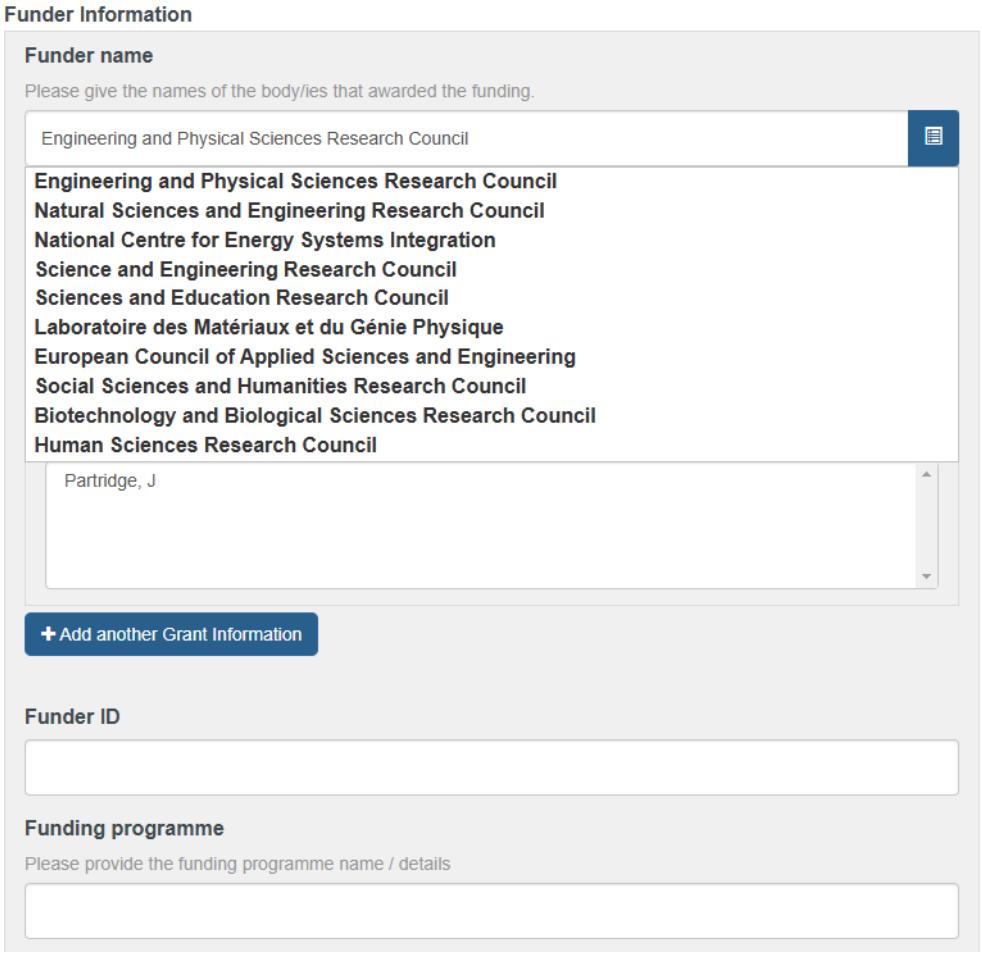

Figure 2: Selecting a funder using a lookup in the ORA review system

[6] https://fast.oclc.org/
[7] https://ror.org/
[8] ISO - ISO 639 — Language code
[9] ISO - ISO 8601 — Date and time format

Using these standards helps ORA keep metadata uniform and compatible with other systems, making it easier to share data and ensure interoperability.

On a local level the ORA review interface links with central user directories which allows for user details (names, email addresses, university department information, ORCID, SSO, etc.) to be added automatically to an object by a look-up using name or email address during the review process.

To further assist with consistency within the review process and to ensure that a certain standard of review is upheld across the review team, Open Access and Repository Supervisors undertake regular checks on public ORA records, asking staff to correct/add anything missed upon review, and check the private metadata to ensure that all reporting is correct.

Automation in ORA metadata review forms

Another element of the recent development project has been introducing automation to the review processes. Some of these features are relatively minor, such as buttons to “decapitalise” values in fields such as title (to conform to Resource Description and Access (RDA) standards) and keywords. At this stage, the decapitalisation is not particularly smart (see ‘Future thoughts’ below), and when using the button, staff must still take the time to ensure proper nouns and abbreviations are properly capitalised, but this is usually faster than manually changing individual letters at the start of every word in a title or keyword set.

A button has also been introduced to the review forms to automatically add text to a “public records note” field, generating an automated statement declaring that an available file is an “accepted manuscript” version, and that the final version may be downloaded from [publisher] at [DOI link]. Further buttons have also been used in the review forms to allow reviewers to simply click to follow a URL or DOI, and to perform searches, such as a Google search of a title, or to look up a journal title or ISSN with Open Policy Finder[10], quickly taking staff to information regarding publisher or journal embargo policies. Whilst these are small time savings within the review process, due to the volume of deposits that require processing, over time this accumulates to a significant reclaim of working hours.

A more substantial feature developed is a process to convert Word document files to PDFs and rename files to match ORA’s standardisation (Name_et_al_2024_First_three_words.pdf). In cases where only one file is present this action now happens on the ingestion of a deposit, but it can also be manually activated by use of a button within the review form. This can cut the time required to review a deposit by several minutes.

The result of these changes to the review interface and review workflow is a 25% increase in the throughput content processed by review staff between the beginning of the project and project close.

[10] https://openpolicyfinder.jisc.ac.uk/. Previously Sherpa Services (ROMEO, JULIET, FACT)

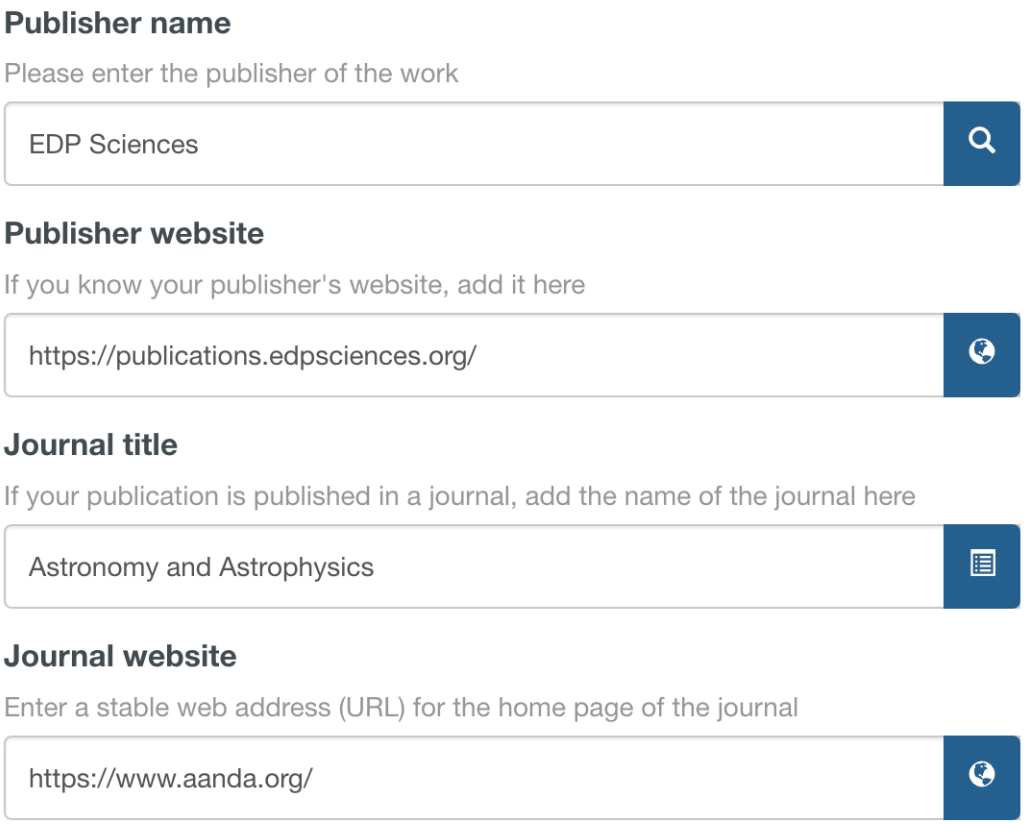

Figure 3: Time-saving buttons alongside the metadata fields in an ORA review form

Open access compliance and interoperability

Alongside improving the metadata review process, ORA has made efforts to improve interoperability and meet open access requirements set by frameworks like the Research Excellence Framework (REF)[11], OpenAIRE[12] and Plan S[13], as well as funders such as UK Research and Innovation (UKRI)[14]. These mandates require research outputs to be openly accessible with interoperable metadata to support accurate compliance reporting.

To meet these requirements, ORA has implemented RIOXX v2[15] standards to metadata and has plans to move to v3 in early 2025. ORA's metadata infrastructure has been updated to ensure that persistent identifiers (PIDs), open access status, re-use licences, and funder details (using RoR) are in line with technical standards set by UKRI and Plan S.

[11] https://www.ukri.org/who-we-are/research-england/research-excellence/research-excellence-framework/
[12] https://guidelines.openaire.eu/en/latest/
[13] https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/principles-and-implementation/
[14] https://www.ukri.org/publications/ukri-open-access-policy/
[15] https://www.rioxx.net/profiles/

ORA shares metadata using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), providing it in various metadata schemas and standards that meet the requirements of scholarly portals like OpenAIRE, DART, and BASE[16]. Outputting metadata to recognised standards and schema also improves compatibility with open access infrastructures, and open access aggregator services like CORE[17], which in turn further impacts the discoverability of University of Oxford research. Since ORA's recent OAI-PMH work, more downloads and interactions with ORA items have been recorded, showing an increase of 172% in download activity (as recorded by IRUS UK) in the last two years (2022-24).

ORA has also incorporated automated harvesting services to streamline repository management and support open access compliance. The Jisc Publications Router[18], a service provided by Jisc, delivers Oxford-affiliated full-text articles directly from publishers to ORA, with a primary focus on gold open access and a selection of green open access content. This automated process reduces the need for manual deposit and update, ensuring that research outputs are more quickly and reliably accessible within the repository, while simultaneously further reducing the strain on researchers' time. Meanwhile, CORE provides ORA with automatic updates for open access content indexed from repositories worldwide[19].

Future challenges

ORA continues to develop its systems and workflows to maintain compliance with funders such as the UKRI[20] and Plan S technical[21] requirements for open access repositories as they continue to change. Funder policies and requirements also continue to have an impact on shaping how ORA collects, stores, and shares content, and the anticipated REF 2029 guidelines will again bring this into consideration.

Work on the next development project has already commenced, further exploring automation options to reduce manual workload and streamline processes for both repository staff and Oxford researchers. This includes integrating tools like Unpaywall[22] and OpenAlex[23] to retrieve open access full text versions of articles that have been identified as having an author affiliated to Oxford. Investigation is also underway into the use of artificial intelligence to improve metadata quality, such as automating the de-capitalisation of output titles and keywords upon ingest, or to extract metadata from PDF files.

[16] https://base-search.net/
[17] https://core.ac.uk/
[18] https://www.jisc.ac.uk/publications-router
[19] http://dx.doi.org/10.5287/ora-nb1bawday
[20] https://www.ukri.org/publications/ukri-open-access-policy/uk-research-and-innovation-open-access-policy/#section-annex-2:-technical-requirements-for-research-articles
[21] https://www.coalition-s.org/technical-guidance_and_requirements/
[22] https://unpaywall.org/
[23] OpenAlex https://openalex.org/ last accessed 21 November 2024

Identifiers continue to play an important role in both ensuring consistent naming and standardisation of metadata and names, but also in automation workflows. Email addresses, ORCIDs and Scopus IDs have recently been identified as having the biggest impact at Oxford with regards to automation, and work is being done to ensure that these are captured across the suite of services collecting researcher information and being made available to Elements and ORA. Building on the current ORCID usage, we hope to improve integration of ORCID identifiers with Jisc Publications Router to capture broader researcher data, such as affiliations and detailed contributions to collaborative research projects.

ORA continues to support Oxford's academic community, but to do so it must remain agile in development, flexible to change, and forward thinking in solution design.

References

Chiu, T., Chen, H. and Cline, E. (2023) 'Metadata implementation and data discoverability: A survey on university libraries' Dataverse portals', *The Journal of Academic Librarianship*, 49(4), p. 102722. doi: 10.1016/j.acalib.2023.102722.

Coalition S (n.d.) Principles and implementation of Plan S. Available at: https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/principles-and-implementation/ (Accessed: 14 November 2024).

Digital Preservation Coalition (n.d.) Metadata and Documentation. Available at: https://www.dpconline.org/handbook/organisational-activities/metadata-and-documentation (Accessed: 14 November 2024).

Editage Insights (2024) 'Role of metadata in enhancing discoverability and impact of scholarly research', *Editage Insights*, 10 September. Available at: https://www.editage.com/insights/role-of-metadata-in-enhancing-discoverability-and-impact-of-scholarly-research.

GO FAIR (n.d.) FAIR Principles: Findable, Accessible, Interoperable, and Reusable. Available at: https://www.go-fair.org/fair-principles/ (Accessed: 14 November 2024).

Kemp, J., Dean, C. and Chodacki, J. (2018) 'Can richer metadata rescue research?', *The Serials Librarian*, 74(1–4), pp. 207–211. doi: 10.1080/0361526x.2018.1428483.

Płoszajski, G. (2017) 'Metadata in long-term digital preservation', in Chen, J. and Wang, Y. (eds.) *Studies in Computational Intelligence*. Berlin: Springer, pp. 15–61. doi: 10.1007/978-3-319-51801-5_2.

UK Research and Innovation (UKRI) (2022) Open Access Policy: Technical Requirements. Available at: https://www.ukri.org/wp-content/uploads/2022/12/UKRI-301122-UKRI-open-access-policy-technical-requirements.pdf (Accessed: 14 November 2024).

University of Cambridge (n.d.) Digital Preservation Policy. Available at: https://www.lib.cam.ac.uk/files/pol_cul_digitalpreservationpolicy.pdf (Accessed: 14 November 2024).

Yang, L. (2016) 'Metadata effectiveness in Internet discovery: An analysis of digital collection metadata elements and Internet search engine keywords', *College & Research Libraries*, 77(1), pp. 7–19. doi: 10.5860/crl.77.1.7.

Metadata & Discovery Group

What Your Acquisitions Colleagues Need to Know About Cataloguing

Anne Welsh 0000-0002-5621-7490
Beginning Cataloguing

Received: 4 Dec 2024 | Published: 16 Dec 2024

ABSTRACT

This article explores cataloguing knowledge and skills needed by acquisitions staff. It explores the diverse backgrounds of acquisitions professionals and the complexities of and changes in cataloguing standards, highlighting developments in cataloguing standards and models, including the IFLA Library Reference Model (LRM), ISBD, RDA, and BIBFRAME, relevant to acquisitions work. Aimed primarily at cataloguers, it is hoped to also be useful to acquisitions colleagues themselves.

KEYWORDS cataloguing standards; acquisitions; LRM; ISBD; RDA; BIBFRAME

CONTACT Anne Welsh anne@beginningcataloguing.com Beginning cataloguing

Acknowledgements

I would like to thank the organisers of the National Acquisitions Group Forum (for public library staff) and Seminar (for academic library staff) for scheduling me to speak at both events. Although the information in this article is aimed at cataloguers who work with acquisitions colleagues, I hope that the information contained in it will also be of use to acquisitions staff themselves.

Introduction

Much has been written about the streamlining of library services across all sectors such that the number of fully-trained cataloguers working in most institutions has reduced since the publication of the Calhoun Report (Calhoun, 2006), which despite actually presenting “Thirty-Two Options and Three Strategies” (Calhoun, 2006, p. 12) from which management teams were invited to choose the most appropriate for their own circumstances, is often cited by those making redundancies in bibliographic services as proof that in-house cataloguing is no longer needed. Suffice it to say here that in both public and academic libraries there is a dearth of staff with confidence in the depth of their cataloguing knowledge. If you are fortunate enough to work in an environment in which it is easy for you to find experienced cataloguers to answer your questions, treasure them. If you are reading this and self-identifying as one of those

cataloguers, make sure you are asking for a suitable paycheck from your employer in return for your expertise.

21st century library acquisitions staff come from a mixture of backgrounds: library, procurement and general administration being the most common. Their skill set is high: they have to know where to find the materials library patrons require and acquire them and in order to do so they have to understand an increasingly complex set of systems, some of them in-house, but many of them external to the library. Some of them may be budget holders, but even those who are not still have to understand and work within the local budgeting calendar. Some of them may be working within a library management system acquisitions module; some may have to process orders through non-library systems; most have to do both. For new books, they have to deal with advance information from publishers, which is subject to change in every key aspect: the title, author(s) and even the ISBN upon arrival may be different from that advertised at the point of ordering. As we know, Publishing is a fast-moving world, and our acquisitions colleagues need to be just as fast to keep up with it.

In some settings, some acquisitions staff work closely with subject librarians to select new materials; in others, they work directly with the user community, perhaps through a library committee or advisory board. Either way, a certain amount of political or diplomatic skill is necessary. In almost every workplace, there are some last-minute orders that need to be processed quickly. The introduction of patron-driven acquisition in most environments needs a high level of skill from the acquisitions team leaders to assist senior management in deciding on the checks and balances required to ensure that they have not essentially given end-users a blank cheque to buy obscure articles and books.

In short, our colleagues working in acquisitions have to hold a wide range of knowledge that goes beyond the world of cataloguing and cataloguing standards. Given the number of articles, blog posts and presentations we in the cataloguing community make about the wide range of changes in cataloguing practice and standards, it's understandable that most acquisitions colleagues are keen to keep abreast of what is going on for us. Whether they download and / or create records in MARC or not, they know that's the exchange format we've been using since the 1960s, and so they wonder about this new format BIBFRAME. Those who trained in LIS up to ten years ago will have learned AACR2, and so they want to know how different RDA is. Those who download shelf-ready records at the acquisitions stage may also have questions around how much RDA they may also be seeing without realising it. As I have been asked by literally countless acquisitions professionals over the last five years[1], "Have I been changing things that are 'right' in RDA back into AACR2 thinking where they were 'wrong'?" The reason given for asking me is usually either "I've asked the cataloguer and they're not sure" or "We don't have a cataloguer at work for me to

[1] Beginning Cataloguing started trading in March 2020, and I delivered a few pro bono training sessions under its brand from September 2019 onwards (Welsh, 2024).

ask." Sometimes it is "I don't want to annoy the cataloguer(s)" or "I'm too scared to ask at work."

So, with all this in mind, this article shares the key points that I think busy acquisitions professionals in most workplaces would like to know. If you're reading this as a bibliographic services manager with a mixed team of cataloguers and acquisitions staff, I hope it will be helpful to you. If you're reading as an experienced cataloguer, I hope it will give you more power to your elbow to ask the bibliographic services manager or acquisitions team leader or whoever manages the acquisitions staff, if you can give a short presentation to the acquisitions team to bring them up-to-speed on changes already being felt by the introduction of RDA internationally and the gearing up towards increased Linked Data, most likely through BIBFRAME. As I often say to colleagues who are either shy about presenting or, more commonly, shy about asking questions, "Enquiring minds need to know!" (keaoli, 2015)[2]

IFLA LRM

The International Federation of Library Associations and Institutions (IFLA) *Library Reference Model* (LRM) (Riva, Le Bœuf and Žumer, 2017) has been around since 2017 and it and its predecessors are foundational to both the *International Standard Bibliographic Description* (ISBD) (Elena et al., 2022) and *Resource Description and Access* (RDA), which began to replace the *Anglo-American Cataloguing Rules. 2nd Edition* (AACR2) from 2013 onwards.

Most cataloguers, most days, don't need to think about the LRM when they are cataloguing something, but they do have to think about it sometimes, and if you've noticed we've started to talk about "elements" and / or "agents" in our cataloguing jargon, that's coming through from the LRM. Similarly, if you've heard us talking about "WEMI" or the "WEMI model" that's coming from the LRM (and its predecessors). The acronym is drawn from the four elements: Work, Expression, Manifestation and Item, which are often described as different "levels". The theoretical underpinning is centred on the relationships between different publications and the "agents" responsible for them. Agents can be human beings or institutions, and the most common are authors, editors, translators, producers and directors, but there are many others we can include in our catalogue data. By thinking about the WEMI inherent in the publications we are cataloguing, we can describe relationships that are more nuanced than we could before.

In most libraries, the LMS doesn't need people to think about WEMI at the acquisitions stage, but if it's interesting to them, acquisitions professionals can read the LRM and follow developments on the IFLA website (IFLA, no date a).

[2] It's an old meme, but it makes the point that people are always asking questions about things some people might find odd.

ISBD

I mentioned ISBD in passing. Anyone who learned about it before 2018 would most likely be aware of it as the root of the rules that determine much of the punctuation we use in catalogue metadata. It still is. As the IFLA website puts it, "The ISBD determines the data elements to be recorded or transcribed in a specific manner and sequence as the basis of the description of the resource being catalogued, and employs prescribed punctuation as a means of recognising and displaying data elements in library catalogues and making them understandable independently of the language of the description" (IFLA, no date b).

You may notice that word "elements" creeping in again. If you think that's coming from the LRM, you would be correct. In fact, in 2018, the IFLA ISBD Review Group started work on a review of the ISBD with the aim of "aligning the ISBD with the LRM to keep a consistency between IFLA standards by providing the overarching conceptual model with an ISBD implementation" (IFLA, no date b). If you work in a big enough, engaged enough library, some of the cataloguers may have been sending responses to various calls for comments from IFLA on the ISBDM, which, as you may have guessed is ISBD for Manifestations – "Manifestation" being one of the elements in the WEMI model set out in the LRM.

In some countries, and in a small number of libraries in the UK, the ISBD is *the* cataloguing standard in use. In most libraries in the UK, ISBD is more in the background, but if you work in a library that is using RDA, it's worth being aware that the ISBDM review was carried out with an awareness of RDA and its decisions are compatible with it (IFLA, no date c).

RDA

RDA itself grew out of AACR2. When the Joint Steering Committee (JSC) for AACR began working on AACR3, they saw a need to do more than simply amend and build on what was there. In 2005, the JSC reported that they were working on RDA as "a new code" that would "simplify … provide more consistency … improve collocation" through an approach that was "principle-based … founded on international cataloguing principles" (Joint Steering Committee for Revision of AACR, 2005, slides 2-3). Crucially, they referenced the approach that would be taken by the LRM.

Sadly, the first of these aims, to "simplify the code" (Joint Steering Committee for Revision of AACR, 2005, slide 2) proved harder to achieve than expected, resulting in a long period of development, which can be summarised as follows:

2010	RDA published in an online form in the *RDA Toolkit*.
2021-17	Regular updates.
2017-2020	*RDA Toolkit* Restructure and Redesign (referred to as the 3R Project).
2018	*RDA Toolkit* beta site published with new text (referred to as Official RDA).
December 2020	The text of the original toolkit was moved to original.rdatoolkit.org and the text of Official RDA was moved to access.rdatoolkit.org.

As at December 2024, the only English-speaking library that has implemented Official RDA is the National Library of New Zealand (National Library of New Zealand, 2024). If you are working in a UK library that is using RDA, it is using Original RDA. Libraries have until the end of May 2027 to move to Official RDA (RDA Board, 2023).

This means that whoever is responsible for the cataloguing policy and practice in libraries must make key decisions. In particular, you may increasingly hear talk about work on an "Application Profile". This is essentially the repository of all the decisions about which options within Official RDA your library will take. An application profile often takes the form of a spreadsheet, but it may also be Policy Statements (either inside or outside the *RDA Toolkit*) or some sort of local manual, which might be a document on your shared drive or intranet, or could be a wiki. Some libraries may choose to follow the British Library Policy Statements, which are contained within the *RDA Toolkit*. In any case, I would expect that if acquisitions staff need to make changes to their processes, whoever oversees cataloguing policy and procedures would let them know.

There is a place, however, in which acquisitions staff may be seeing metadata based on RDA. If you download records from a library supply database it is most likely to be RDA. You may notice differences from the way things looked before, and you may have to take it on trust that these differences are probably RDA. In case it helps, here's an idea of the age of metadata and whether it is likely to be RDA or AACR2:

Before 2010	Metadata was created in AACR2 in MARC.
2010-2011	The Library of Congress coordinated tests of RDA in MARC across several major US libraries. The earliest RDA in MARC metadata was created as part of these tests.
2011 onwards	Some US libraries who took part in the US tests continued to create metadata in RDA in MARC.
2013	The earliest UK-created metadata began to appear as Original RDA was implemented by the British Library (including its Cataloguing-In-Preparation metadata, supplied by BDS).
2013 onwards	Increasingly more RDA metadata created in an increasing number of libraries worldwide.

Many libraries and consortia carried out batch modifications where these were possible, so that even if you are downloading records created before 2010, some of their fields and subfields may have been modified to be RDA-compliant. This can result in hybrid records that were created under AACR2 but have been partly (or mainly) changed by a computer transformation to include some RDA.

The business need for acquisitions staff to know about these kinds of changes varies from library to library. Some acquisitions staff don't download records at all. Others download records but only need to check a few fields, such as ISBN, author, title and format are correct.

DCRMR

Few acquisitions staff deal with rare materials, but in the interests of completeness, it may be worth sharing *Descriptive Cataloging of Rare Materials. RDA Edition (DCRMR)* (RBMS Bibliographic Standards Committee, 2022) with them. A free resource, it can be described as an application profile in that it identifies how RDA is applied to rare materials. It also works well in terms of translating existing library concepts into the jargon used by RDA, so it can be useful for those who trained in cataloguing before RDA.

BIBFRAME

Few acquisitions staff have not come across references to BIBFRAME in the literature and / or at conferences and other meetings. For those who work outside the LMS, BIBFRAME is likely to be irrelevant, but they may be professionally curious to know that the Library of Congress is working on a replacement for the MARC format which they intend will exploit the full capacity of RDA for linked data. Those who work within the LMS will probably be glad of some reassurance that changes by your software provider

are some way in the future. Both groups of acquisitions staff may or may not want to know that there is lots of information on BIBFRAME on the Library of Congress website, including details of conversion programs from MARC to BIBFRAME (Library of Congress, 2024).

MARC

That brings us neatly back to MARC. The level of MARC knowledge that acquisitions staff need varies from library to library and from role to role. Given that the "MARC must die" papers which were so prevalent a few years ago did the rounds of the acquisitions conferences, it is probably worth reinforcing that MARC looks set to remain for a few years yet – the Library of Congress itself is continuing to catalogue concurrently in MARC and BIBFRAME while it continues to develop BIBFRAME. The MARC manuals continue to be provided free (Library of Congress, 2023).

AACR2

Finally, what is there to say about AACR2? Within UK Higher Education libraries, AACR2 is an artefact of the past, but it does continue to be used in many other settings. If you are working in an RDA library, I think it's worth reinforcing that "weird stuff" in the catalogue (or in metadata downloaded from other people's catalogues) *may* be old, following pre-RDA rules. And if someone has been trained in cataloguing under AACR2, they do not need to relearn *everything*. The title is still the title; the publisher is still the publisher; the size of a book and the runtime of a movie still are as they are.

Cataloguing in the 21st century, still remains the intellectual activity of examining the output of a publisher, analysing it, and describing it in ways that will enable someone seeking it to find it – even when the seeker does not know the specific thing they seek exists. As to how the library came to acquire that specific thing? That's a matter for our acquisitions colleagues. We just catalogue the materials they acquire.

References

Calhoun, K. (2006) *The Changing Nature of the Catalog and its Integration with Other Discovery Tools*. Final Report. Washington DC: Library of Congress. Available at: https://www.loc.gov/catdir/calhoun-report-final.pdf (Accessed: 11 December 2024).

Elena, E.R. et al. (2022) *ISBD International Standard Bibliographic Description : 2021 Update to the 2011 Consolidated Edition*. Den Haag: IFLS. Available at: https://repository.ifla.org/handle/20.500.14598/1939

IFLA (no date a) *IFLA's Bibliographic Conceptual Models*. Available at: https://www.ifla.org/g/cataloguing/ifla-s-bibliographic-conceptual-models/ (Accessed: 11 December 2024).

IFLA (no date b) *About the ISBD*. Available at: https://www.ifla.org/g/isbd-rg/international-standard-bibliographic-description/ (Accessed: 11 December 2024).

IFLA (no date c) *ISBD for Manifestation (ISBDM)*. Available at https://www.ifla.org/g/isbd-rg/isbd-for-manifestation-isbdm/ (Accessed: 11 December 2024).

Joint Steering Committee for Revision of AACR (2005) RDA: *Resource Description and Access*. Revised July 8. Available at: https://www.rdatoolkit.org/archivedsite/docs/rdapptjuly2005.pdf (Accessed: 11 December 2024).

keaoli (2015) *'Enquiring minds need to know!'* [Imgur] 27 October. Available at: https://imgur.com/gallery/enquiring-minds-need-to-know-HTyi1PB (Accessed: 11 December 2024).

Library of Congress (2024) *Bibliographic Framework Initiative*. Available at: https://www.loc.gov/bibframe/ (Accessed: 11 December 2024).

Library of Congress (2023) *MARC Standards*. Available at: https://www.loc.gov/marc/ (Accessed: 11 December 2024).

National Library of New Zealand (2024) *MARC Record Changes Due to RDA Implementation*. Available at: https://natlib.govt.nz/librarians/cataloguing-standards-at-the-national-library/marc-record-changes-due-to-rda-implementation (Accessed: 11 December 2024).

RBMS Bibliographic Standards Committee (2022) *Descriptive Cataloging of Rare Materials*. RDA Edition. Available at: https://bsc.rbms.info/ (Accessed: 11 December 2024).

RDA Board (2023) *Countdown Clock for Original RDA Toolkit Set for May 2026*. Available at: https://www.rdatoolkit.org/news/rda/countdown-clock-original-rda-toolkit-set-may-2026 (Accessed: 11 December 2024).

Riva, P., Le Bœuf, P. and Žumer, M. (2017) *IFLA Library Reference Model: A Conceptual Model for Bibliographic Information*. Amended and corrected. Den Haag: IFLA. Available at: https://repository.ifla.org/handle/20.500.14598/40

Welsh, A. (2024) *'Yesterday marked five years since I gave my first pro bono workshop under the Beginning Cataloguing brand'* [LinkedIn]. Available at: https://www.linkedin.com/feed/update/urn:li:activity:7238098729214377984/ (Accessed: 11 December 2024).

Catalogue & Index is electronically published by the Metadata & Discovery Group of the Chartered Institute of Library and Information Professionals (CILIP) (Charity No. 313014).

Submissions: Please follow the submission guidance on our website.

Book reviews: Please contact the editors.

Advertising rates: GBP 70.00 full-page; GBP 40.00 half-page. Prices quoted without VAT.

ISSN 2399-9667

MDG Website: www.cilip.org.uk/mdg

MDG blog: http://catandindexgroup.wordpress.com/

CILIP SPECIAL INTEREST GROUP

OPEN ACCESS