Catalogue & Index | Issue 210 (2025)

Metadata & Discovery Group

The technical side to forming an anti-racist and inclusive library catalogue at Cardiff University

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Received: 28 Feb 2025 | Published: 17 Mar 2025

ABSTRACT

As part of a project to create an anti-racist and inclusive library catalogue, records containing outdated and harmful terminology in the subject headings were identified. This article describes the technical work which supported the identification of the records and the solutions used to remove, replace or remediate the headings.

KEYWORDS Alma; PrimoVE; normalization rules; analytics; harmful language; outdated terminology; Library of Congress Subject Headings; Medical Subject Headings

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Introduction

The project to create an anti-racist and inclusive library catalogue at Cardiff University has been written about in detail in the accompanying article by Miller, Pierce & Stallard (2025). Funding from the Higher Education Funding Council for Wales (HEFCW) to support race equality initiatives was awarded to the library service and resulted in a six-month cataloguing post to scope out the scale of harmful terminology contained in subject headings within the library catalogue. Recommendations to address the problem were devised, and a plan for implementation put in place. Identification of problematic terms, replacement of terms with more appropriate language, and the bulk manipulation of data within our library management system involved Analytics reports and the creation of normalization rules. It was deemed more useful for potential interested readers to separate out the technical sides of the project and detail them in a distinct article which could be referred to for practical as well as theoretical purposes.

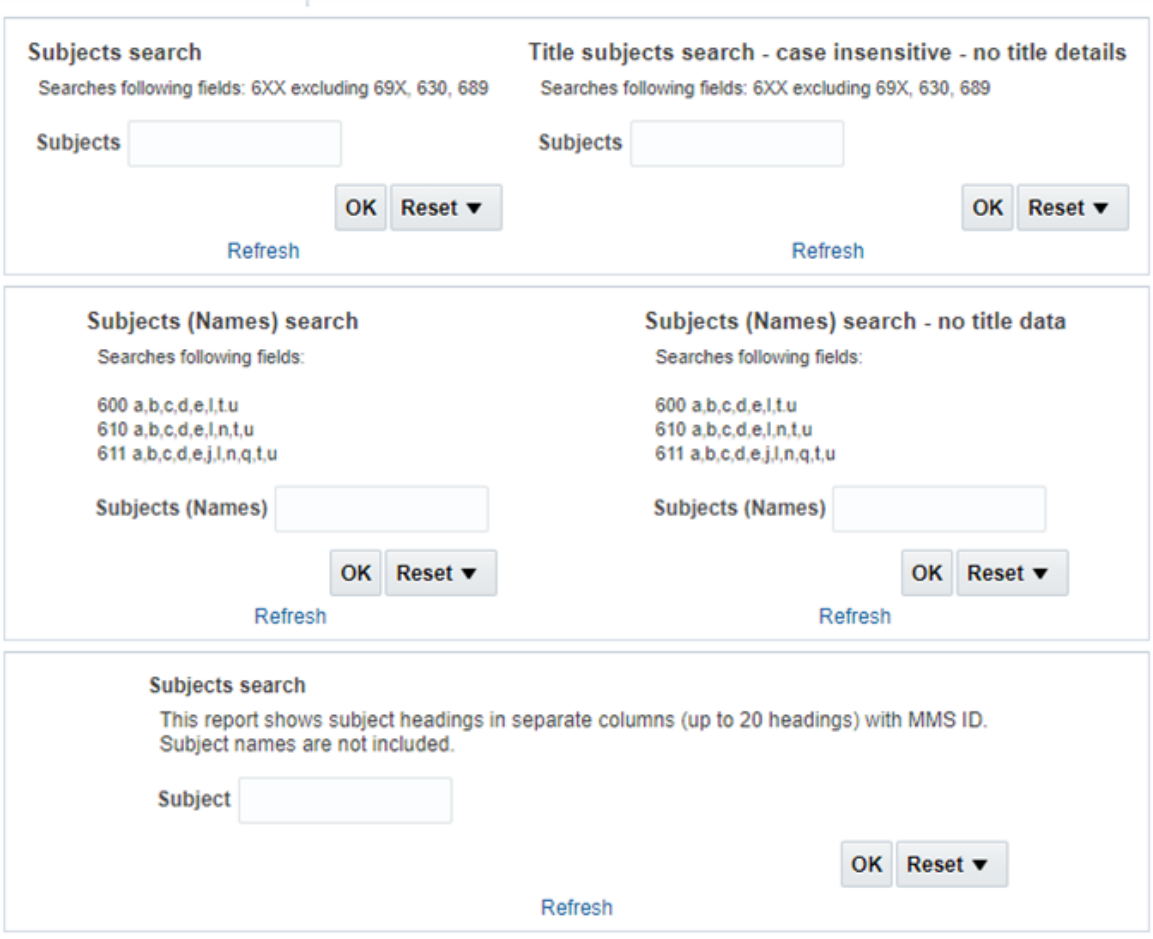
Cardiff University uses Alma library management system (Ex Libris) and we are fortunate to have a Premium Sandbox environment alongside our Production

environment. This allows us to do rigorous testing in the Sandbox before doing anything to our live data.

After initial discussions with Mouse Miller (project cataloguer) about what information and processes would be required to meet the aims of the project, the library systems team checked the existing scheduled jobs in Alma to see if any were relevant. There was a daily scheduled job running (*Authorities - Preferred Term Correction*) which performs preferred term correction on all bibliographic records that are linked to authority records, including terms in the 650 field (ExLibris, 2025 a). However, the job does not pick up records with outdated subject headings which had been migrated from our previous library management system (Voyager) in August 2016. Only records which had been subsequently edited or added since that migration would be picked up in the scheduled job. This meant we had lots of records to manually update with preferred terms.

Analytics reports

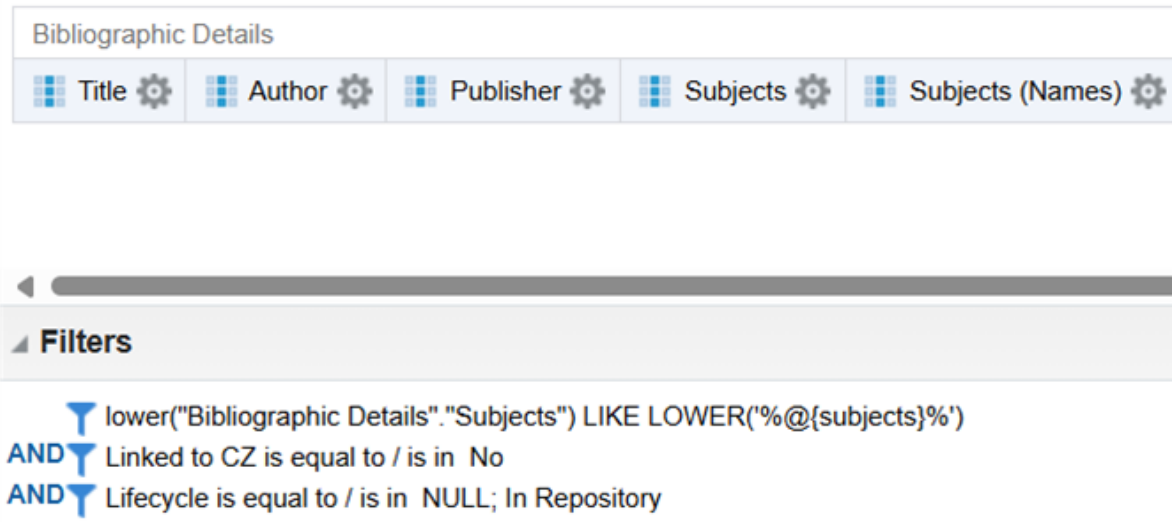
Our library systems colleague, Bronwen Blatchford, created an Alma Analytics dashboard (ExLibris, 2025 b) for Mouse to use to identify records containing subject headings which were outdated. Alma Analytics is built on Oracle Business Enterprise Edition (OBIEE) and is split into 'subject areas'. All the reports mentioned in this article were created in the Titles subject area in Analytics. Analytics is only available in our



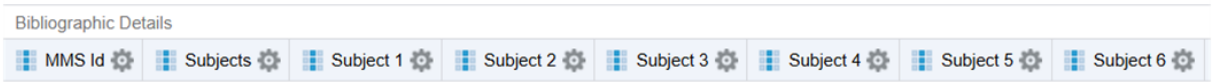
production Alma environment and data is loaded every night – this means the reports are showing the data from the previous day's activities.

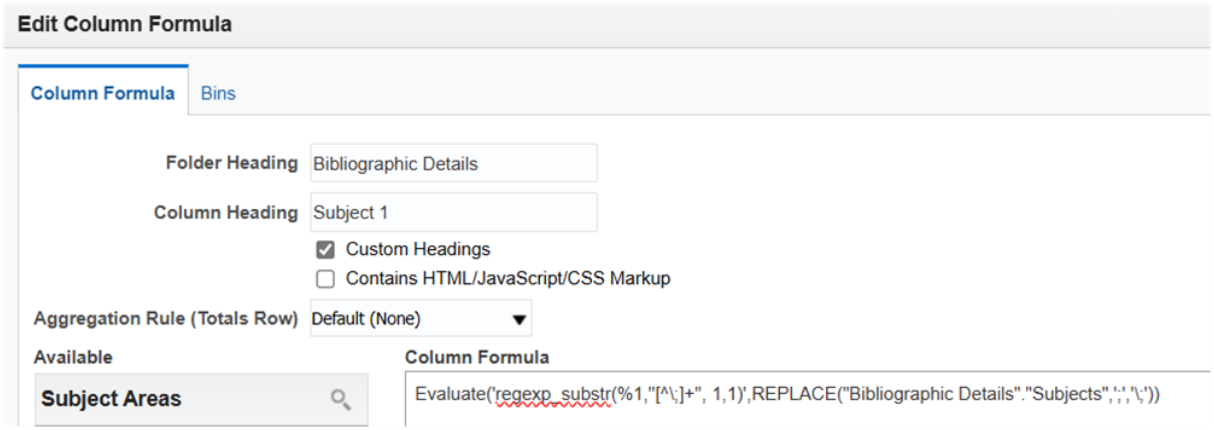
It should be noted that there are limitations with Alma Analytics, including the inability to see information about the first and second indicators of the bibliographic records in reports. Analytics treats 'Subjects' as one field, which includes all 600 fields excluding 69X, 630, 689. There is a separate Subject (Names) field which includes 600, 610 and 611 fields. The dashboard (screenshot below) was designed to allow searching in either area but there was/is a frustration that we couldn't be more specific and search only the 650 fields.

The dashboard prompts allow case insensitive searches of a term or terms which is/are contained anywhere in the 600 fields. The results filter out any records which are linked to the Community Zone (i.e. records which are not editable by Cardiff University cataloguers) and do not include records which are deleted. Each of the reports contains these same filters:



The final Subjects search report was added to the dashboard to show the subject headings in a more user-friendly way by delimiting up to 20 headings. Additional columns were added and the column formula changed to produce the delimited headings (instructions available at Kortick, 2016):





Titles - case insensitive - subject headings delimited

MMS Id	Subjects	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10
99651653402420	African Americans; Afro-American women; Black politics; Civil rights; Race relations; Feminism; Politics; USA	African Americans	Afro-American women	Black politics	Civil rights	Race relations	Feminism	Politics	USA		
991701573402420	United States--Armed Forces--Afro-American soldiers.	United States--Armed Forces--Afro-American soldiers.									
992033233402420	X, Malcolm,--1925-1965.; Organization of Afro-American Unity.; African Americans.; Civil rights.; USA.	X, Malcolm,--1925-1965.	Organization of Afro-American Unity.	African Americans.	Civil rights.	USA.					

Return - Refresh - Export - Create Bookmark Link

Mouse used the dashboard to identify records which contained headings that were in need of attention (see the accompanying article by Miller, Pierce & Stallard, 2025) and created sets of those records in Alma Sandbox. Sets are used to provide the records required for all sorts of manual and scheduled jobs in Alma. They can be private or public and are visible to Alma users who have the appropriate roles.

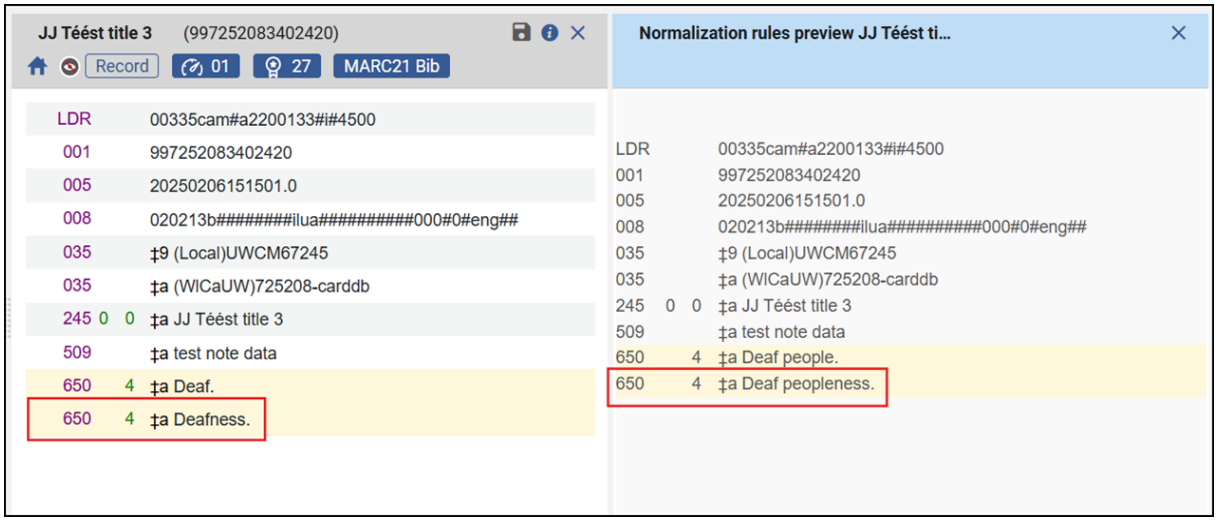
Mouse also created and shared a spreadsheet with the list of headings to be changed and what they were going to be changed to. Some of the changes were more complicated than others, e.g. replacing a Library of Congress Subject Heading (LCSH) with a Medical Subject Heading (MeSH) plus a second 650 field, or replacing a $a subfield heading and adding a $z subfield as well. We had already discussed the options for how best to make changes based on the number of records that had been found. Where there were only a handful of records with a particular heading, those would be changed manually. For headings which occurred in lots of records, we agreed that normalization rules run specifically on the sets created by Mouse was our preferred option. We did look at other alternatives, such as exporting records and using MarcEdit, but we didn't have any previous experience with MarcEdit and decided to stick with a more familiar set-up.

Normalization rules

If you are a novice with normalization rules, as we all were at the start of the project, the Working with Normalization rules webpage (ExLibris 2025 c) is a great starting point. It gives clear information about what you can do with normalization rules, how to create and run them and lots of examples and links to other resources. The section on Normalization Rule Syntax was arguably the most important and was revisited throughout the course of the project.

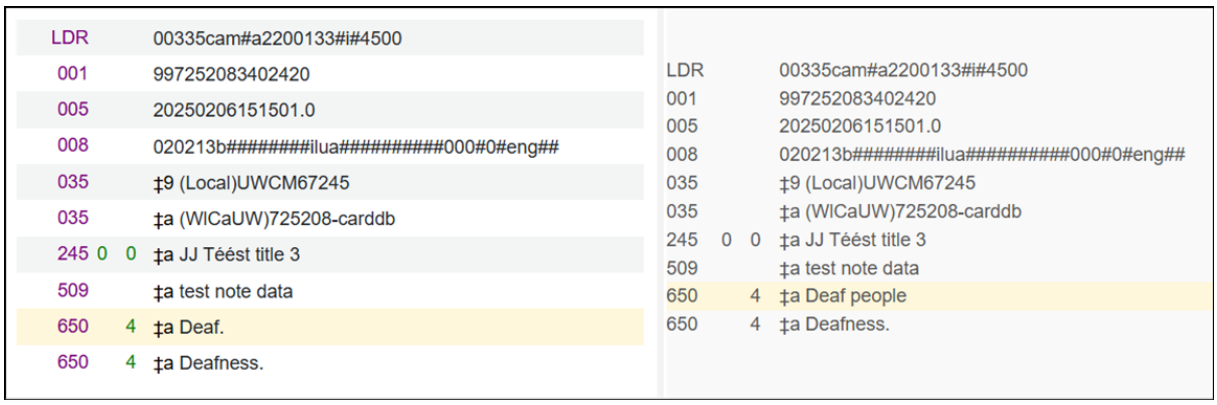
The first rule we attempted was a simple example with a straightforward swap of one subject heading for an alternative subject heading. We found an example of a similar rule on the Ex Libris Knowledge page and started to test it in the metadata editor (MDE). By checking against bibliographic records which contained the outdated heading/s (which we accessed via the sets created earlier), we used the split-screen mode in the MDE to see if the rule worked and then make small iterative changes to reach the desired state. As mentioned already, the syntax of the rule is crucial and we discovered early on that a simple full stop at the end of a subject heading could make a real difference to whether the rule did or didn't behave in the expected way. For example, the rule below will replace any occurrence of the word Deaf in the 650$a subfield, including if it appears as part of a word e.g. Deafness:

```
rule "replace 650a Deaf with Deaf people"
when
(TRUE)
then
replaceContents "650.a.Deaf" with "Deaf people"
end
```



By re-reading the online help page, we found that you have to use four backslashes to match the period if it appears at the end of the subfield (*Wildcards and Special Characters* section in the *Working with Normalization Rules* documentation *(*ExLibris, 2025 c).

```
replaceContents "650.a.Deaf\\\\." with "Deaf people"
```



LDR			00335cam#a2200133#i#4500
001			997252083402420
005			20250206151501.0
008			020213b########ilua##########000#0#eng##
035			‡9 (Local)UWCM67245
035			‡a (WlCaUW)725208-carddb
245	0	0	‡a JJ Téést title 3
509			‡a test note data
650		4	‡a Deaf.
650		4	‡a Deafness.

LDR			00335cam#a2200133#i#4500
001			997252083402420
005			20250206151501.0
008			020213b########ilua##########000#0#eng##
035			‡9 (Local)UWCM67245
035			‡a (WlCaUW)725208-carddb
245	0	0	‡a JJ Téést title 3
509			‡a test note data
650		4	‡a Deaf people
650		4	‡a Deafness.

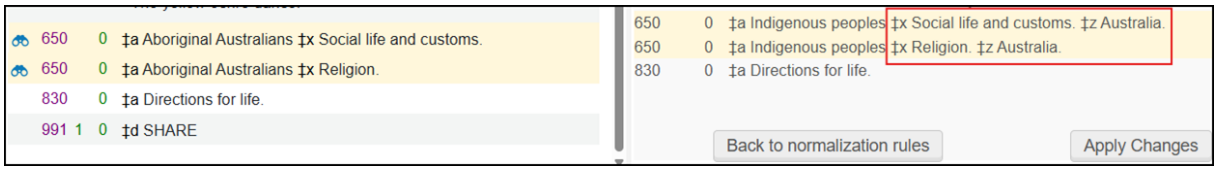
Understanding the syntax allowed Vicky to work out what was needed in various scenarios. If we only wanted to change existing LCSH, part of the rule could ensure that only 650 fields containing a second indicator of 0 were included. If there were fields which contained an example of the heading with and without a full stop, then we could use a pipe to include both versions of the heading. In addition to the syntax, the order of actions in the rule will determine whether the rule works as you intended. There was a lot of trial and error!

Using the examples on the Ex Libris Knowledge Center page and in the Ex Libris Developers network (Kortick, 2024) we started to build a library of rules to apply to different sets. In our earlier discussions, Mouse and Vicky had decided to write rules for each heading or group of headings where the same action was required. We ended up with one rule for headings which were only a single heading being replaced, one rule for ‘change heading and add x or z field’, one rule for ‘change heading and add new 650 _2 field’ and so on.

Vicky reached out to the Alma user community via the mailing list[1] for help when trying to figure out some of the more complicated rules. The question asked was:

> I want to replace an outdated subject heading (650 $a Aboriginal Australians) with a different term ($a Indigenous peoples) and also add a sub-field ($z Australia.) when the $z doesn't already exist. Several records in the set I'm working on have additional $x and $z fields in the 650 fields (sometimes multiple x's or z's), as well as the $a heading which is being replaced.
>
> I've tried to write the rule in logical stages so the rule replaces the $a term, then adds the $z if it doesn't exist (there are a few more stages after this but I have questions at this point in the rule).
>
> I end up with records with two sub-fields followed by full stops if the '$z Australia.' sub-field is added.

[1] analytics@exlibris.com



> I did have another step in the rule to remove all full stops from v,x,y,z sub-fields but then I have the opposite problem with other records where there is no full stop on the final sub-field of the field if the $z Australia field isn't added.
>
> Question: is there a way to make sure there is a full-stop in only the final sub-field of the field, regardless of whether it is sub-field v,x,y,z (and there may be multiple x or z's in the field as a whole)?

We got responses almost immediately, including the syntax which did exactly what we needed. Our original rule is shown here, alongside the final answer from the mailing list:

Vicky's original full rule

```
rule "replace 650a Aboriginal Australian with Indigenous peoples_temp"
#replace single term for LCSH or Undefined indicator with temporary
new heading (no full stop as will be followed by additional $z if
doesn't already exist)
priority 20
when
(TRUE)
then
replaceContents "650.a.Aboriginal Australians\\\\" with "Indigenous
peoples_temp" if (exists "650.{*,0}.a.Aboriginal Australians\\\\")
replaceContents "650.a.Aboriginal Australians\\\\" with "Indigenous
peoples_temp" if (exists "650.{*,4}.a.Aboriginal Australians\\\\")
end

rule "Replace single term in 650.a followed by x or z subfield"
#when sub-field a is followed by another sub-field, replace (plural)
$a term with temp new heading if 2nd indicator matches (LCSH here so
0)
priority 19
when
(((exists "650.{*,0}.a.Aboriginal Australians") OR (exists "650.
{*,4}.a.Aboriginal Australians")) AND ((exists "650.{*,*}.x.*") OR
```

```
(exists "650.{*,*}.z.*")))
then
replaceContents "650.a.Aboriginal Australians" with "Indigenous
peoples_temp"
end

rule "add subfield z to Indigenous peoples_temp"
#adds subfield z when it doesn't already exist
priority 17
when
not exists "650.z.Australia*"
then
addSubfield "650.z.Australia\\\\" if (exists "650.a.Indigenous
peoples_temp")
end

rule "Change second indicator of field 650 to _0 if values are
anything else"
#overwrites any existing indicators after term has been changed from
oldSH to newSH as above.
priority 16
when
(TRUE)
then
changeFirstIndicator "650" to " " if (exists "650.{*,*}.a.Indigenous
peoples_temp")
changeSecondIndicator "650" to "0" if (exists "650.{*,*}.a.Indigenous
peoples_temp")
end

rule "Replace temp subject heading with new subject heading"
#removes the _temp extension on all $a headings
priority 15
when
(TRUE)
then
replaceContents "650.a.Indigenous peoples_temp" with "Indigenous
peoples"
end

rule "remove duplicate 650 fields"
priority 14
when
(TRUE)
```

```
then
correctDuplicateFields "650"
end
```

Final version from the mailing list

```
rule "replace 650$a Aboriginal Australians with Indigenous peoples,
add $z Australia."
priority 20
    when
        (TRUE)
    then
        # replace Aboriginal Australians for LCSH or Undefined
indicator with a temporary term
        replaceContents "650.a.Aboriginal Australians" with
"Indigenous peoples_temp" if (exists "650.{*,0}.a.Aboriginal
Australians|Aboriginal Australians\\.")
        replaceContents "650.a.Aboriginal Australians" with
"Indigenous peoples_temp" if (exists "650.{*,4}.a.Aboriginal
Australians|Aboriginal Australians\\.")

        # If the heading already has $z Australia, it is done--change
temp heading to permanent heading
        replaceContents "650.a.Indigenous peoples_temp" with
"Indigenous peoples" if (exists "650.z.Australia*")

        # Now work on the remaining headings that don't have $z
Australia
        # Remove period from $a, $x, $y, $z so that a new subfield can
be added
        replaceContents "650.*.\\." with "_PER_" if (exists "650.
a.Indigenous peoples_temp*")
        replaceContents "650.*.(.*)_PER_$" with "$1" if (exists "650.
a.Indigenous peoples_temp*")
        replaceContents "650.*._PER_" with "."

        # Add $z Australia.
        addSubfield "650.z.Australia\\\\." if (exists "650.
a.Indigenous peoples_temp")

        # Change indicators
        changeFirstIndicator "650" to " " if (exists "650.a.Indigenous
peoples_temp")
        changeSecondIndicator "650" to "0" if (exists "650.
a.Indigenous peoples_temp")
```

```
        # Change temporary term to Indigenous peoples"
        replaceContents "650.a.Indigenous peoples_temp" with
"Indigenous peoples"

        correctDuplicateFields "650"
    end
```

A cataloguer in the US responded to Vicky's email to say that the order of sub-fields matters in the 650 field – this was useful information, and Vicky added a new step in some of the rules to flag where sub-field order may need manual checking after the bulk change:

```
rule "add 997 when term and sub-field exists"
priority 9
    when
        (((exists "650.a.Aboriginal Australians")) AND ((exists "650.
v.*") OR (exists "650.x.*") OR (exists "650.y.*") OR (exists "650.
z.*")))
        then
        addField "997.a.Check LCSH sub-field order ($a Indigenous
peoples $z Australia). DELETE THIS FIELD ONCE CHECKED"
    end
```

The syntax suggestions provided by the Alma community encouraged Vicky to improve the rules she had already written which made them all much shorter and tidier while still achieving the same result. It also made us realise that we needed a way to identify the records we had amended or reviewed as part of the project. Consequently, a step was included in **all** of the rules which added a 997 field to each record:

```
rule "add 997 for project when term exists so we know heading will be
updated"
priority 10
    when
        (exists "650.a.Aboriginal Australians")
        then
        addField "997.a.Subject headings updated as part of Race
Equality Project 2024"
    end
```

The 997 field is searchable in Alma which means cataloguers can check for records with any of the text above without having to wait for an Analytics report. We also included a rule to delete duplicates (correctDuplicateFields) of 650 and 997 fields at the

end of each rule in the event that more than one field was updated and the record had two instances of the exact same field.

The rules were now ready to run on the sets created by Mouse. In Alma, this meant creating a normalization process (Exlibris, 2025 d) and running the appropriate rule on each set. Here is a screenshot of the spreadsheet tracking the set name, subject heading, replacement heading/additional field and the rule to be used on the set:

Set	Subject Heading	Prior	R/M	No. of reco	2nd Indicat	REPLACE WITH
Afro	Afro-American authors	2	R	40	0	African American authors
	Afro-Americans	2	R	221	0	African Americans
	Afro-American Writers	2	R	19	0	African American authors
	Afro-American literature	2	R	21	0	|a American literature |x African American aut
Black	Blacks	1	R	154	0	Black people
Creole	Creoles	2	R/M	15	0	Racially mixed people
Ngro	Negroes	1	R	74	0	Black people
Slave	Slaves	1	R	62	0	Enslaved persons
	Slave labor	1	R	8	0	Slavery
	Slave Labour	1	R	4	0	Slavery
	Fugitive slaves	1	R/M	19		
AmericanI	American Indians	1	R	21	0	|a Indigenous peoples |z North America
Eskimo	Eskimos	1	R	17	0	Arctic peoples
IndiansofNA	Indians of North America	1	R	334	0	|a Indigenous peoples |z North America
AAustralian	Aboriginal Australians	1	R	77	0	|a Indigenous peoples |z Australia
Aborigine	Aborigines	1	R	20	0	Indigenous peoples

2nd In	ADD ANOTHER 650 FIELD	Rule or rules to be used on set
		VS 650 SHAfro
		VS 650 SHAfro
		VS 650 SHAfro
hors		VS 650 SHAfro
		VS 650 single terms on multiple sets
2	|a Creole people	VS 650 SHCreole
		VS 650 single terms on multiple sets
		VS 650 SHSlave
		VS 650 SHSlave
		VS 650 SHSlave
0	|a Enslaved persons	VS 650 SHSlave
		VS 650 SHAmericanI IndiansofNA
		VS 650 single terms on multiple sets
		VS 650 SHAmericanI IndiansofNA
		VS 650 AAustralians replace $a and add $z when not exists
		VS 650 single terms on multiple sets

Potentially you could have all records in one big set and run the rules one by one but we erred on the side of caution by doing them heading by heading, which made it easier to keep track of. Once the rules had been run on the sets, we re-ran the reports in Analytics the following day to see which records still had outdated terms.

In addition to running normalization rules on specified sets, you can also run normalization processes on imports (for newly acquired records) and on saving bibliographic records in Alma. We considered whether we wanted to implement either of these options as part of the project. Given the huge variety of headings that could be included, we decided against it and instead we have set up a monthly Analytics report to pick up any new or amended records with outdated headings.

Display rules

There were a number of outdated headings which either didn't have an acceptable alternative or were likely to be updated by Library of Congress in the near future. Rather than changing the bibliographic records, we agreed to use normalization rules in our discovery layer (Primo VE, known locally as LibrarySearch) to replace the outdated headings as displayed in the public library catalogue.

The Ex Libris online help page (ExLibris, 2025 e) provided information on Primo normalization rules, syntax (which is slightly different to Alma normalization rule syntax) and examples. There were further examples on the Developer Network too (Vardi, 2023).

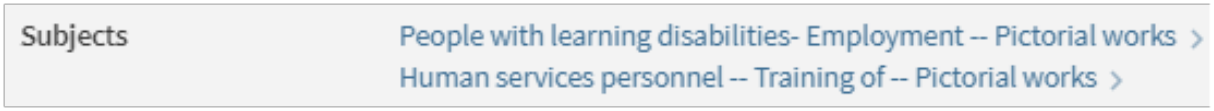
Fortunately for us, SUNY had already worked on a project to change subject headings and were Primo VE customers. Their SUNY's Change the Subject Project documentation (SUNY (State University of New York) Office of Library and Information Services, 2023) was very helpful and we 'borrowed' their normalization rule wording! Their rules worked for like-for-like swaps, e.g.

```
replace string by string (TEMP"1","Transexuals","Transexual people")
```

There were some headings in our rule which required a bit more work, for example, where we wanted to replace 'Learning disabled' with 'People with learning disabilities'. We wanted to replace the term if it was on its own in the record or if it was followed by another sub-field:

```
replace string by string (TEMP"1","Learning disabled.?$|Learning
disabled [^a-z]","People with learning disabilities")
```

This isn't a perfect solution as part of the delimiter (--) between sub-fields disappears in the display but it is a temporary solution. We are hopeful that the authority heading itself will change at some point in the future making the display rule obsolete.

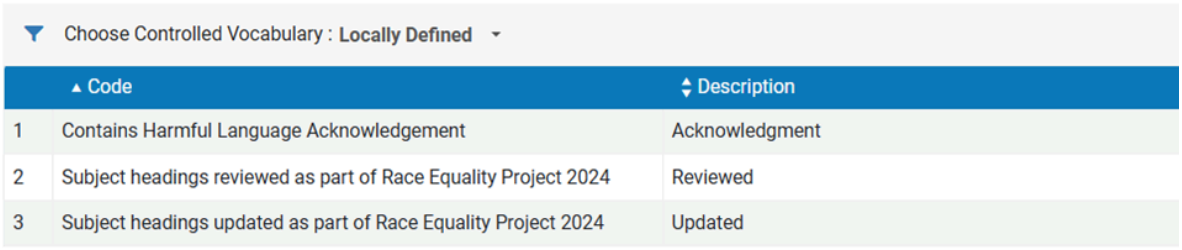


There is more work that we could do with the display rules (creating local/non-authorised subject headings) to ensure that the subject searches work more effectively in Primo and we plan to revisit this in the future.

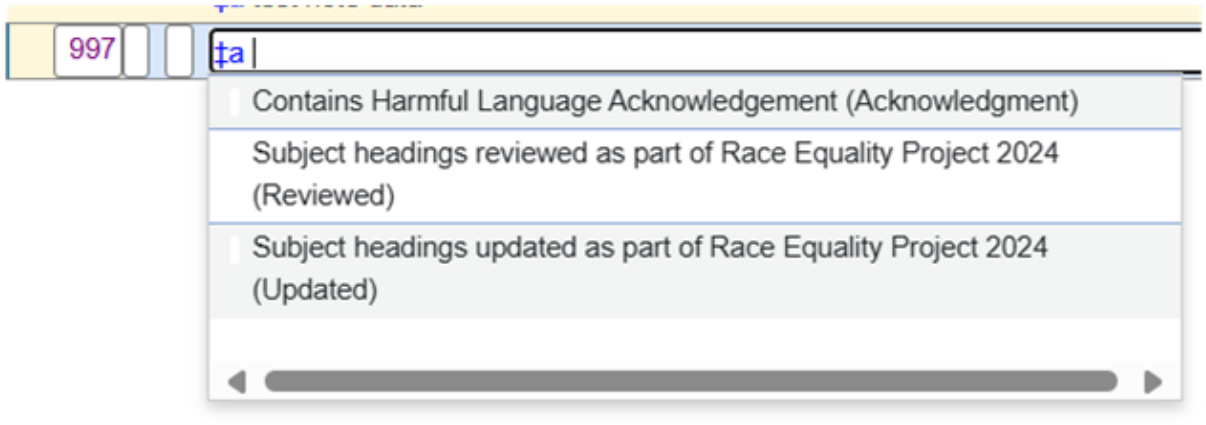
Controlled vocabulary

As already mentioned, a monthly Analytics report is sent to our Cataloguing team which picks up any records with outdated headings. The report is also available on-demand on the dashboard. The report includes the 997 field to make it obvious if the record has already been updated or reviewed. If the cataloguing staff manually update

any new records as a result of the report, we wanted to make sure they could add the same standard line of text to the 997 field as had been used in the bulk updates. In Alma, Vicky added a controlled vocabulary to the MARC21 bibliographic records in the 997 subfield a.



When the cataloguer is reviewing or updating a record from the report in the metadata editor, they add a 997 field $a and a dropdown with the controlled vocabulary will appear:



This both saves time for the cataloguer and ensures consistency, meaning that we can use the 997 text to report on the number of records which have been amended, updated or can't be updated but have an acknowledgement.

Conclusion

The project was a great opportunity to see how we could use Alma's existing processes and functionality to do both the remediation work and maintenance work. Vicky found learning about normalization rules really challenging; it was a steep learning curve but incredibly satisfying and rewarding to see the rules work. We feel

sure there are tricks we have missed along the way which could have improved our experience on this project, but we are happy with the results. We were privileged at Cardiff University to have a dedicated project cataloguer and a small team of systems librarians which meant that time, resource and expertise was available for the project. In addition, the Alma community is a vibrant and helpful space, and we definitely benefitted from the expertise and experience of library and technical staff across the world. I would encourage anyone who is undertaking a similar project to reach out to their fellow librarians and community members for help and advice.

References

ExLibris (2025 a) Jobs related to authority records. *Alma: Product Documentation. Alma Online Help (English). Metadata Management. Working with Authority Records*. Available at : https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/Metadata_Management/060Working_with_Authority_Records#Jobs_Related_to_Authority_Records [Accessed: 24 February 2025].

ExLibris (2025 b) Analytics. *Alma: Product Documentation. Alma Online Help (English)*. Available at: https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/080Analytics [Accessed: 24 February 2025]

ExLibris (2025 c) Working with normalization rules. *Alma: Product Documentation. Alma Online Help (English). Metadata Management. Working with Rules*. Available at: https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/Metadata_Management/016Working_with_Rules/020Working_with_Normalization_Rules [Accessed: 24 February 2025].

ExLibris (2025 d) Working with normalization processes. *Alma: Product Documentation. Alma Online Help (English). Metadata Management. Metadata Management Configuration*. Available at: https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/Metadata_Management/210Metadata_Management_Configuration/Configuring_Cataloging#Working_with_Normalization_Processes [Accessed: 24 February 2025]

ExLibris (2025 e) Configuring normalization rules for display and local fields. *Primo. Product Documentation. Primo VE. Primo VE (English). Display Configuration*. Available at: https://knowledge.exlibrisgroup.com/Primo/Product_Documentation/020Primo_VE/Primo_VE_(English)/050Display_Configuration/Configuring_Normalization_Rules_for_Display_and_Local_Fields [Accessed: 24 February 2025]

Kortick, Yoel (2016) *How to separate semicolon delimited values to separate columns*. Available at: https://knowledge.exlibrisgroup.com/@api/deki/files/48771/How_to_separate_semico__lon_delimited_values_to_separate_columns.pptx?revision=2 [Accessed 24 February 2025].

Kortick, Yoel (2024 [updated 2025]) Alma normalization rules examples. *Tech Blog*. Available at: https://developers.exlibrisgroup.com/blog/alma-normalization-rule-examples/ [Accessed 24 February 2025].

Miller, Mouse, Pierce, Karen F. and Stallard, Vicky (2025) Forming an anti-racist and inclusive library catalogue at Cardiff University. *Catalogue & Index* 210, pp. 26-45. Available at: https://journals.cilip.org.uk/catalogue-and-index/article/view/719

SUNY (State University of New York) Office of Library and Information Services (2023) Change the Subject Project. *Libguides*. Available at: https://sunyolis.libguides.com/c.php?g=986218&p=7623203 [Accessed: 24 February 2025].

Vardi, Moran (2023 [updated 2024]) Primo VE Normalization Rule Examples. *Tech Blog*. Available at: https://developers.exlibrisgroup.com/blog/primo-ve-normalization-rule-examples/ [Accessed: 24 February 2025].