



NARDAC Update Forum

R | D | A
Resource Description & Access

Agenda

- NARDAC Update **by Clara Liao**
- Update from the Joint RDA Board and RSC Working Group on Artificial Intelligence **by Ahava Cohen**
- Isn't There an App for That?
Using PowerApps and AI for Automated Cataloguing and more **by Hannes Lowagie**



NARDAC Update

Clara Liao
NARDAC Chair
PTCP, Library of Congress

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NARDAC

North American RDA Committee

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2024 NARDAC Members (May-)

American Library Association (ALA) Representatives

- Robert Maxwell, Brigham Young University
- Adam Schiff, University of Washington

Canadian Committee on Cataloguing (CCC) Representatives

- Thomas Brenndorfer, Guelph Public Library
- Hong Cui, Library and Archives Canada

Library of Congress (LC) Representatives

- Clara Liao, PTCP
- Melanie Polutta, PTCP

Library Science Education: Dr. Shawne D. Miksa, University of North Texas

French Language Cataloging: Daniel Paradis, Bibliothèque et Archives nationales du Québec

Organizational Roles

NARDAC Chair

Clara Liao, Library of Congress, PTCP

NARDAC Representative to the RSC


Robert Maxwell, Brigham Young University

NARDAC Representative back-up

Melanie Polutta, Library of Congress, PTCP

NARDAC Coordinator of Web content

Melanie Polutta, Library of Congress, PTCP



NARDAC activities July 2024-Oct. 2024

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Working on Proposals to RSC

- Trying to build up connection between Manifestation elements with
 - Guidance: Data provenance: Recording a source of metadata that is a manifestation that is being described
 - Guidance: Data provenance: Recording a source of metadata that is not a manifestation that is being described
- Working with CC:DA on a proposal to include numerals in languages beyond Latin-script to be used as part of a name access point.
- Proposing a minor revision of Corporate Body: variant access point for corporate body

RSC proposals and discussion paper review

- **RSC proposals**

- **RSC/ExamplesEditor/2024/1** : add glossary definitions for fictitious entity and non-human entity
 - [RSC-Examples Editor-2024-1-NARDAC response.pdf \(rdatoolkit.org\)](#): [2 pages]
- **RSC/TechnicalWG/2024/2** : revise definitions of *aggregate*, *aggregating work* and *aggregates* guidance
 - [RSCTechnicalWG-2024-2rev-NARDAC response.pdf \(rdatoolkit.org\)](#) [4 pages]

RSC proposals and discussion paper review

- **RSC proposals**

- **RSC/ORDAC/2024/1** : dual-language naming of Corporate Body and Place
 - [RSC-ORDAC-2024-1-NARDAC response.pdf \(rdatoolkit.org\)](#) [3 pages]
- **RSC/ReligionsWG/2024/2** : revise Name of Corporate Body
 - [RSC-ReligionsWG-2024-2-NARDAC-response.pdf \(rdatoolkit.org\)](#) [1 page]

- **Discussion paper**

- **RSC/ExtentWG/2024/1**: Development of Extent Elements in RDA
 - [RSC-Extent WG-2024-1-rev2-NARDAC response.pdf \(rdatoolkit.org\)](#) [10 pages]

Prepare for Future Forum Programs

- Reached out to New Zealand colleagues about their RDA implementation work
- Contacted the PCC Working Group on Metadata Application Profiles for their work update

Looking Ahead

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Future Forums/Updates

- New NARDAC chair will be elected in Dec.
- NARDAC Spring Update Forum (possibly in April.)
 - RDA application profile?
 - RDA implementation in New Zealand
 - Any suggestion?

RSC/RDA Board Joint Working Group on Artificial Intelligence

Ahava Cohen

European representative to the RSC
Chair, Joint Working Group on AI

Why do we need a joint working group on AI?

- ❑ Incorporation of AI in publishing
- ❑ Incorporation of AI in ILS
- ❑ AI and RDA/LRM

-

Membership

Ahava Cohen, Europe Representative to the RSC, Chair

Colleen Barbus, RDA Board Chair

Christian Aliverti, RDA Board

Judith Cannan, RDA Board

Renate Behrens, RSC Chair

Charlene Chou, RSC Wider Community Engagement Officer

James Hennelly, ALA Digital Reference ex officio

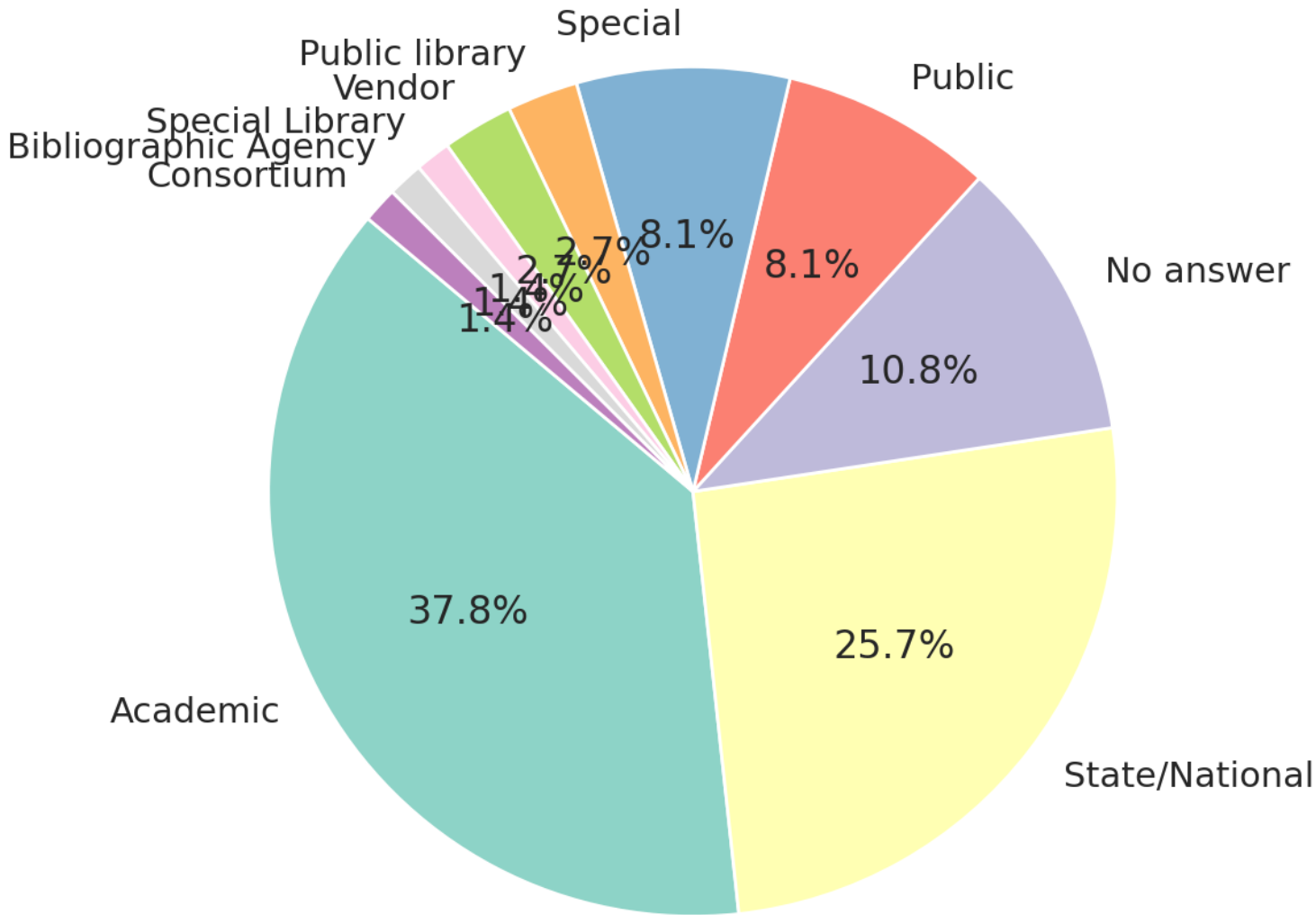
Tasks

Review 5 provided documents for context

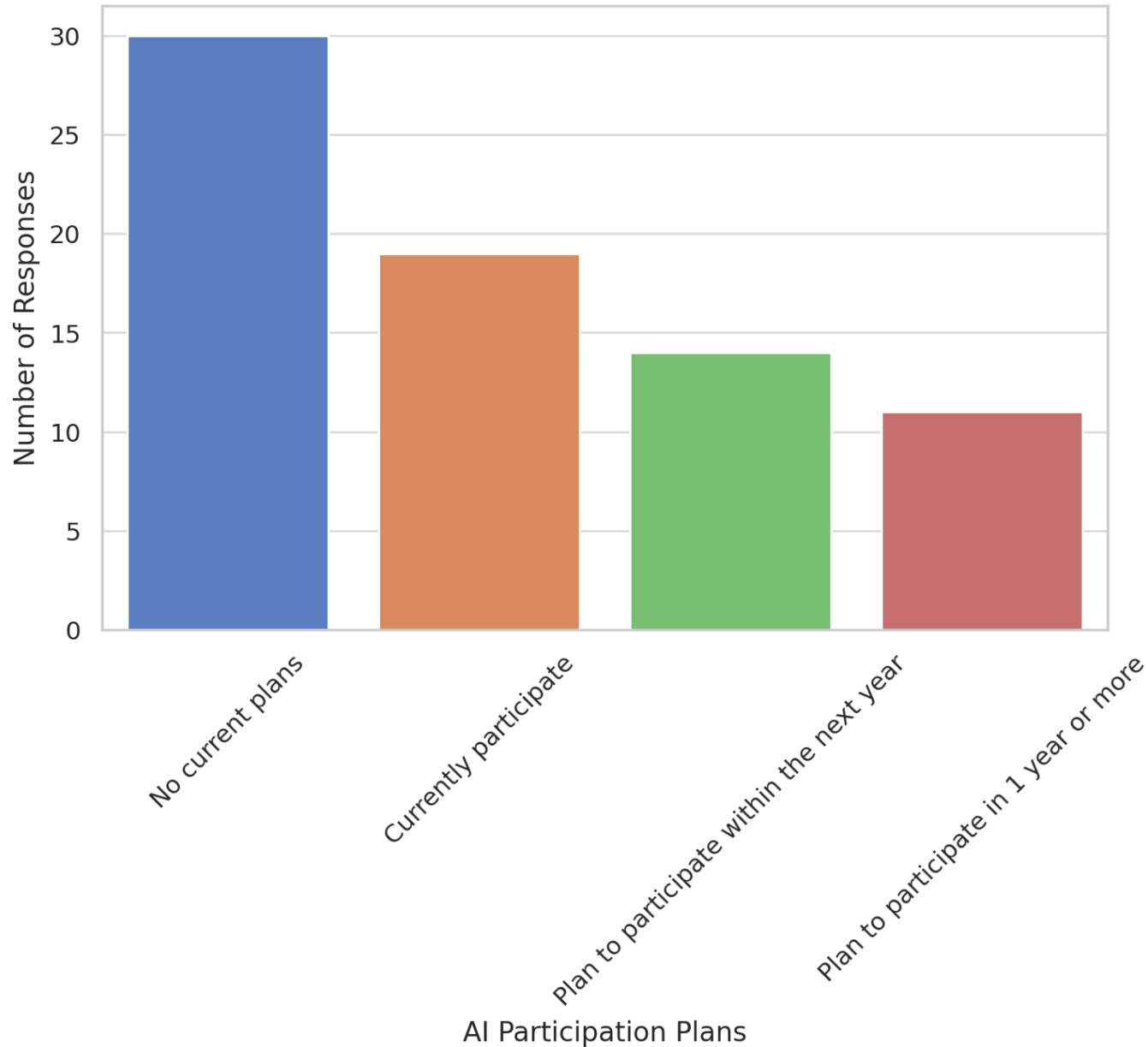
Research 4 questions.

Prepare a report for the RDA Board, and a discussion paper for the RSC.

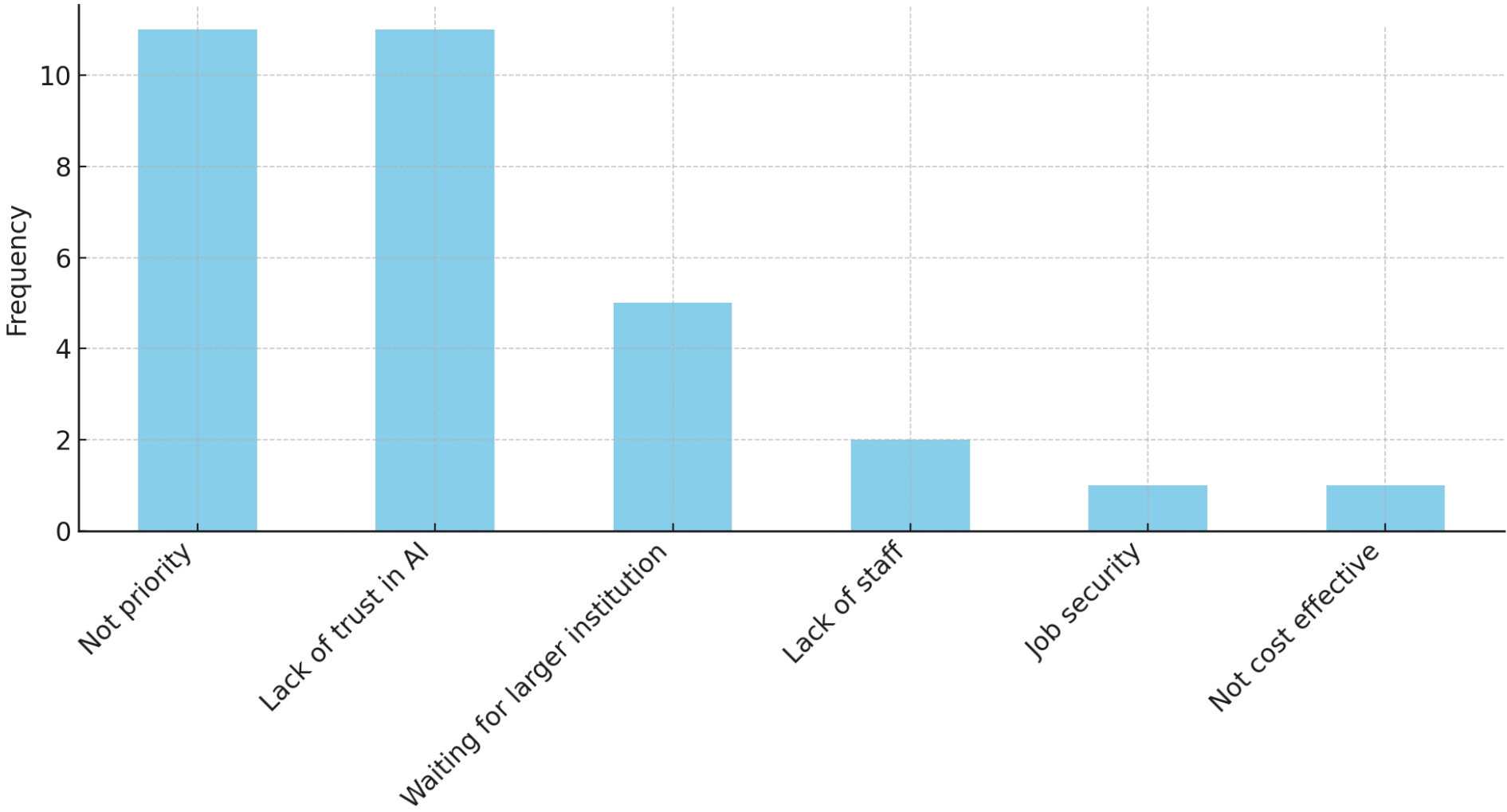
Library Types



Staff Participation in AI Plans



Frequency of Reasons for Not Investigating or Implementing AI





How is AI expected to impact our professional lives?

The Role of AI in Cataloging

- ❑ Use of machine learning and Natural Language Processing (NLP) to automate repetitive tasks and transcribe information, allowing librarians to focus on higher-level, analytical work.
- ❑ Allow smaller libraries with limited resources to leverage AI built in to their systems for efficient cataloging.
- ❑ Enhance operational efficiency. It cannot replace human catalogers.

Looking Ahead

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Deliverables

- ❑ Brief progress reports to the RDA Board and the RSC for each meeting.
- ❑ Interim report to the RDA Board and the RSC in December 2024.
- ❑ Final report to the RDA Board and the RSC in December 2025.

Next steps

- ❑ Approval of WG white paper by the RDA Board and the RSC
- ❑ Operationalize findings of the WG survey in light of the white paper



Isn't There an App for That? Using PowerApps and AI for Automated Cataloguing and more

Hannes Lowagie

Head of the Agency for Bibliographic Information in Royal
Library of Belgium (KBR), the National Library of Belgium

Vice-chair of EURIG

KBR

- Royal Library of Belgium.
- National library
- Museum (medieval manuscripts)
- 5 million books
- 3 million patrimonial objects (coins, medals,



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Today

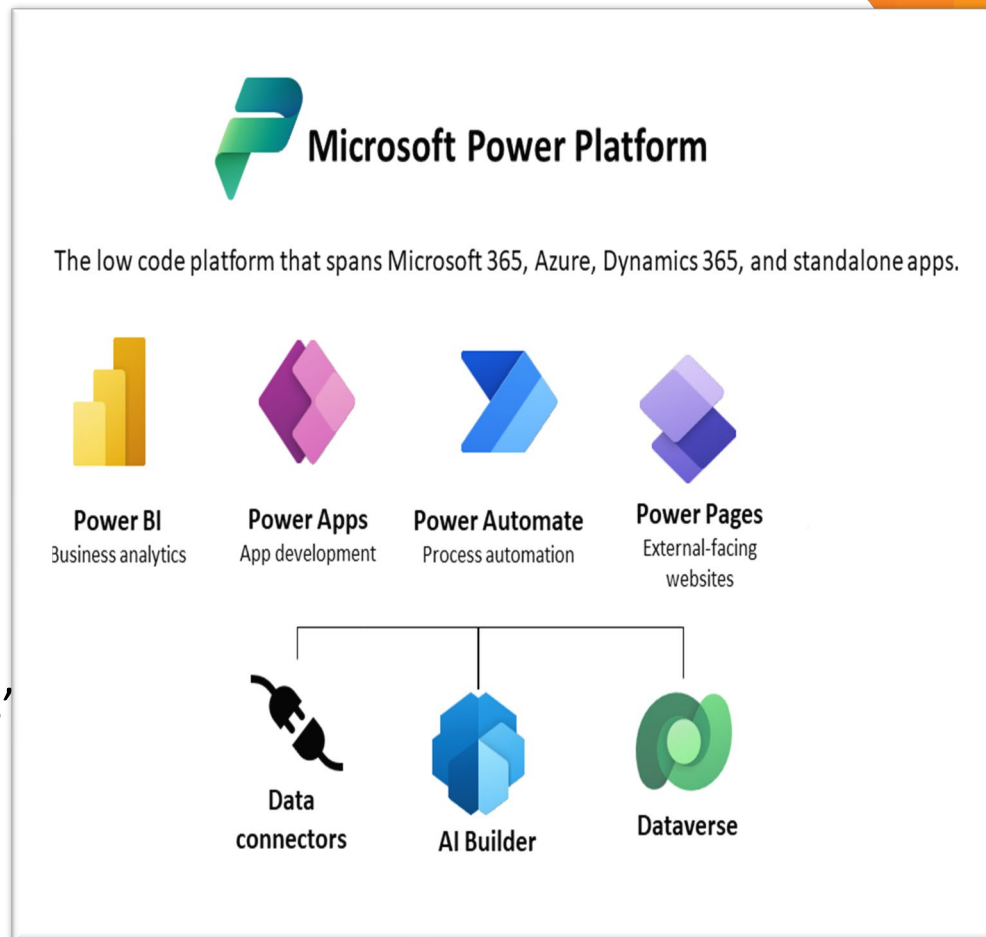
- Using Power Apps for Creating Bibliographic Records :
 - Detection of Metadata from title page and colophon
 - Enrichment
 - Subject Indexing and Entity Extraction
- Using Power Apps for Creating an RDA Application Profile, with a Validation Method
 - Using QA Catalog and Shacl4Bib

Part 1

Using Power Apps for Creating Bibliographic Records

Power Apps and Power Automate

- **A low-code platform developed by Microsoft that enables users to create custom business applications.**
 - Build apps with ease using a visual interface, no need for extensive coding knowledge.
 - Connect with a wide range of Microsoft and third-party services like SharePoint, Microsoft365, SQL Server, and more.
 - Incorporate AI capabilities to enhance processes.
 - Designed for both professional developers and 'Citizen Developers' (like me) who want to quickly build and deploy applications.



[Resource Description & Access](#)

Retrocatalography

- 5 million books, of which 3 million in online catalogue



Workflow Retrocatalography application

Scan of Title Page : Students (2023) and sheltered workshop (2024)

SharePoint : Upload file (scan of document) in SharePoint

Power Automate : Detects new file → Power Automate flow starts

AI-model : Flow uses AI-model to detect title, author, publisher, etc

Dataverse : Information saved in Dataverse Table


















Power Apps : Metadata from Dataverse visualised in application

: Human validation and correction (optional)

: Export CSV

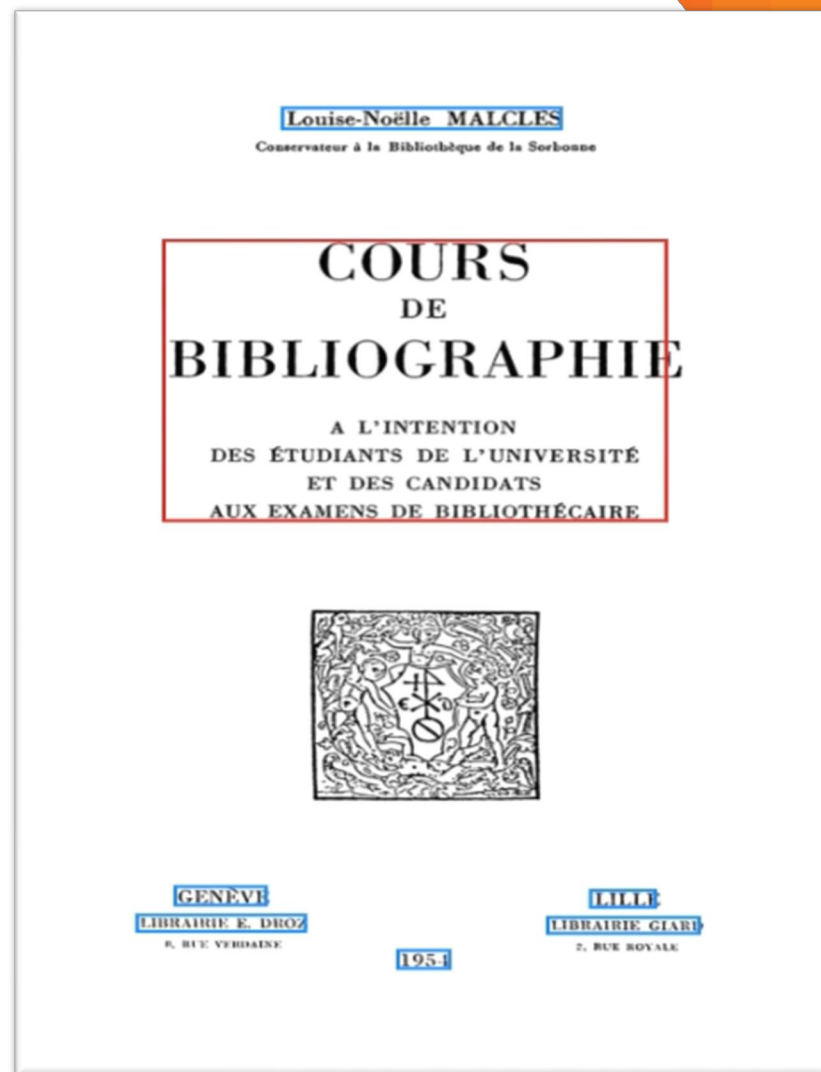
Final step : Import CSV in our LMS

AI-models Power Platform (prebuilt + custom)


















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Custom 'Document processing' model

- **Based on images**
 - Detection of pre-defined metadata on (images of) documents
 - A minimal training set of 5 examples can be enough
 - The AI creates rules dynamically, using various variables, such as :
 - Overall Structure of the Title Page
 - Text Placement
 - Font Size
 - Text Content (e.g.: Edition Statement)

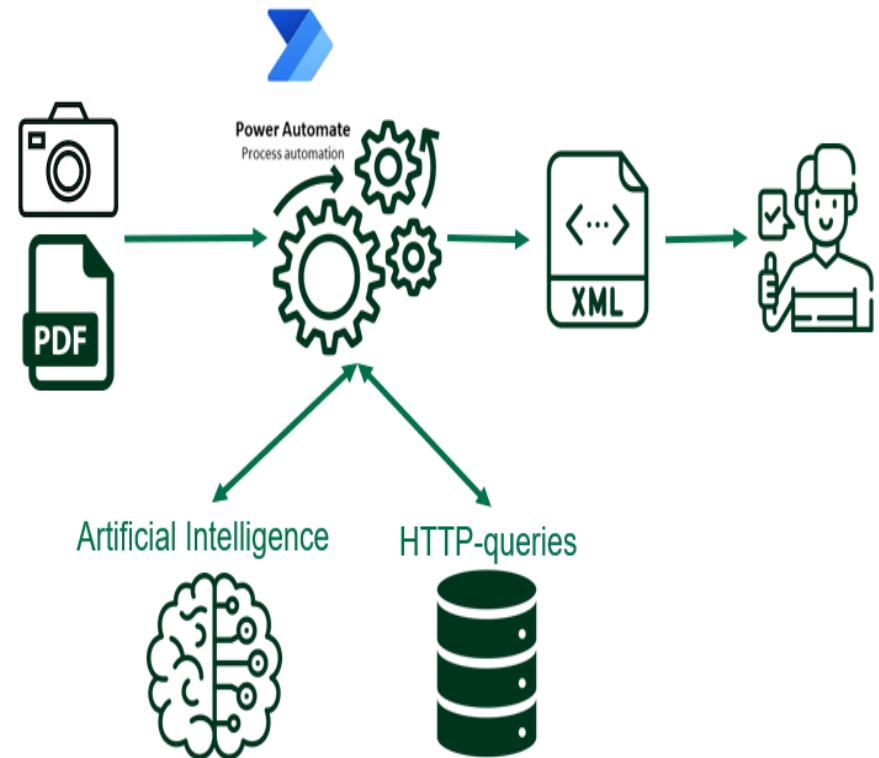



AI-models Power Platform (prebuilt + custom)

 <p>Invoice processing Extract information from invoices</p> <p>PREBUILT MODEL</p>	 <p>Text recognition Extract all the text in photos and PDF documents (OCR)</p> <p>PREBUILT MODEL</p>	 <p>Receipt processing Extract information from receipts</p> <p>PREBUILT MODEL</p>	 <p>Identity document reader Extract information from identity documents</p> <p>PREBUILT MODEL</p>	 <p>Business card reader Extract information from business cards</p> <p>PREBUILT MODEL</p>	 <p>Document processing Extract custom information from documents</p> <p>CUSTOM MODEL</p>
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Next phase : Contemporary books

- Legal Deposit : Fast Registration of Incoming Books
 - Take scan and send it to SP
 - Using a mobile phone
 - Extra AI-model : Colophon
 - Back cover : subject / entities
 - HTTP Queries
 - Other catalogues, ISNI, ...
 - Create file
 - Import in LMS
 - 5 minutes after scan, record is created in LMS



 AITitlePage ...


* AI model ▼

* Form type ▼

* Form



Title, author, publisher, year, place

 AIColophon ...


* AI model ▼

* Form type ▼

* Form



ISBN, publisher, year, legal deposit number, contributors, copyright, etc. (ISNI?)

 GetText ...

* Image



Back cover text

Use result of AI-output

- Use the detected metadata immediately in HTTP request to search and import more information : about the record, the author or the work
- Example :
 - AI-model 'Colophon' detects an ISBN
 - Use that ISBN immediately in API / SRU call to search external databases (without human intervention)

IfISBNFound

`empty(...)` is equal to `false`

+ Add

✓ If yes

Run HTTP KBR

Run HTTP BNF

Run HTTP DNB

ExtractMetadataMarc21

✗ If no

IfAuthorDetected2

IfAuthor2Detected2

Add an action

Ex. Search DNB

The screenshot displays a web browser window with two tabs. The active tab is titled "Run HTTP DNB". Below the address bar, there is a section for configuring an HTTP request, titled "HTTP DNB".

The "HTTP DNB" section includes the following fields:

- * Method:** A dropdown menu set to "GET".
- * URI:** A text input field containing the URL: `https://services.dnb.de/sru/dnb?version=1.1&operation=searchRetrieve&query=020a value &recordSchema=MARC21-xml`. A blue search icon and a small "x" are visible next to the query part.
- Headers:** A table with two columns: "Enter key" and "Enter value". One row is filled with "Accept" and "*/*".
- Queries:** A table with two columns: "Enter key" and "Enter value".
- Body:** A text input field with the placeholder "Enter request content".
- Cookie:** A text input field with the placeholder "Enter HTTP cookie".


















Below the "HTTP DNB" section is a link that says "Show advanced options" with a downward arrow.

The second tab is titled "HTTPResponseDNB" and is currently active. It displays the response details:

- * Name:** A dropdown menu set to "HTTPResponseDNB".
- * Value:** A text input field containing "Body" with a green icon and a small "x".

Arrows indicate the flow from the "Run HTTP DNB" tab to the "HTTPResponseDNB" tab, and from the "HTTPResponseDNB" tab to the footer area.

Back Cover Text : Subject Indexing

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Back Cover Text : Entity Extraction



Invoice processing

Extract information from invoices

PREBUILT MODEL



Text recognition

Extract all the text in photos and PDF documents (OCR)

PREBUILT MODEL



Receipt processing

Extract information from receipts

PREBUILT MODEL



Identity document reader

Extract information from identity documents

PREBUILT MODEL



Business card reader

Extract information from business cards

PREBUILT MODEL



Document processing

Extract custom information from documents

CUSTOM MODEL



Sentiment analysis

Detect positive, negative, or neutral sentiment in text data

PREBUILT MODEL



Category classification

Classify customer feedback into predefined categories

PREBUILT MODEL [PREVIEW](#)



Entity extraction

Extract key elements from text, and classifies them into predefined categories

PREBUILT MODEL



Key phrase extraction

Extract most relevant words and phrases from text

PREBUILT MODEL



Language detection

Detect the predominant language of a text document

PREBUILT MODEL



Text translation

Detect and translate more than 90 supported languages

PREBUILT MODEL



Category classification

Classify texts into custom categories

CUSTOM MODEL



Entity extraction

Extract custom entities from your text

CUSTOM MODEL



Prediction

Predict future outcomes from historical data

CUSTOM MODEL



Object detection

Detect custom objects in images

CUSTOM MODEL



Image description

Generate description of an image

PREBUILT MODEL [PREVIEW](#)

- **Final step: Generate output with collected metadata**

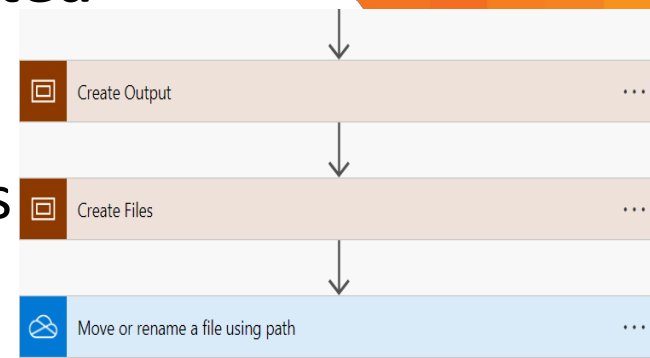
- Extracted metadata
- Imported metadata from HTTP requests
- Subjects or entities from back cover

- **Output options**

- Create file such as MARC 21 XML, BIBFRAME, or others
- Send file to LMS (FTP or API)
- Collect information in Excel
- Send information back to Power Apps (correction, validation)

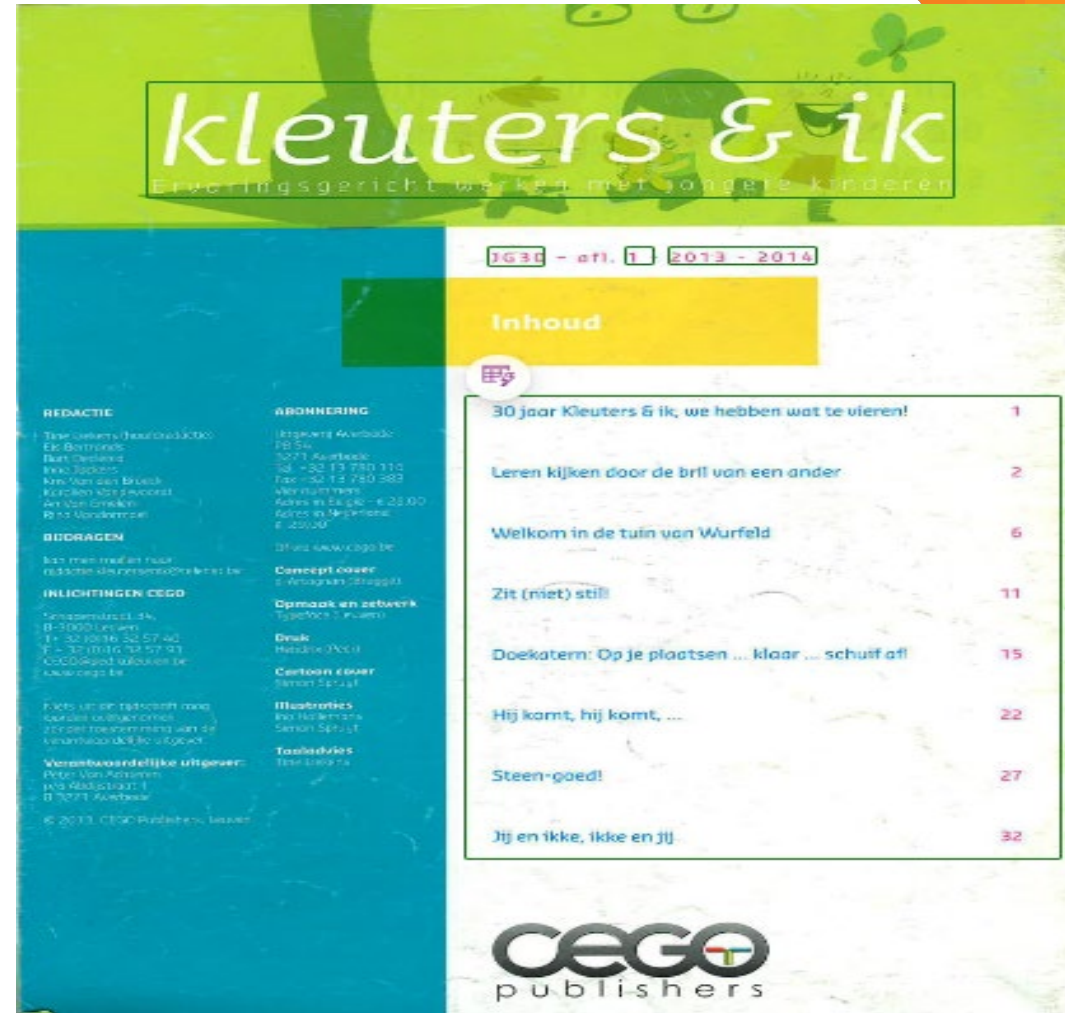
- **Various options are available, with the choice determined by internal workflows and organisational structure**

- It is not possible to present a single definitive solution

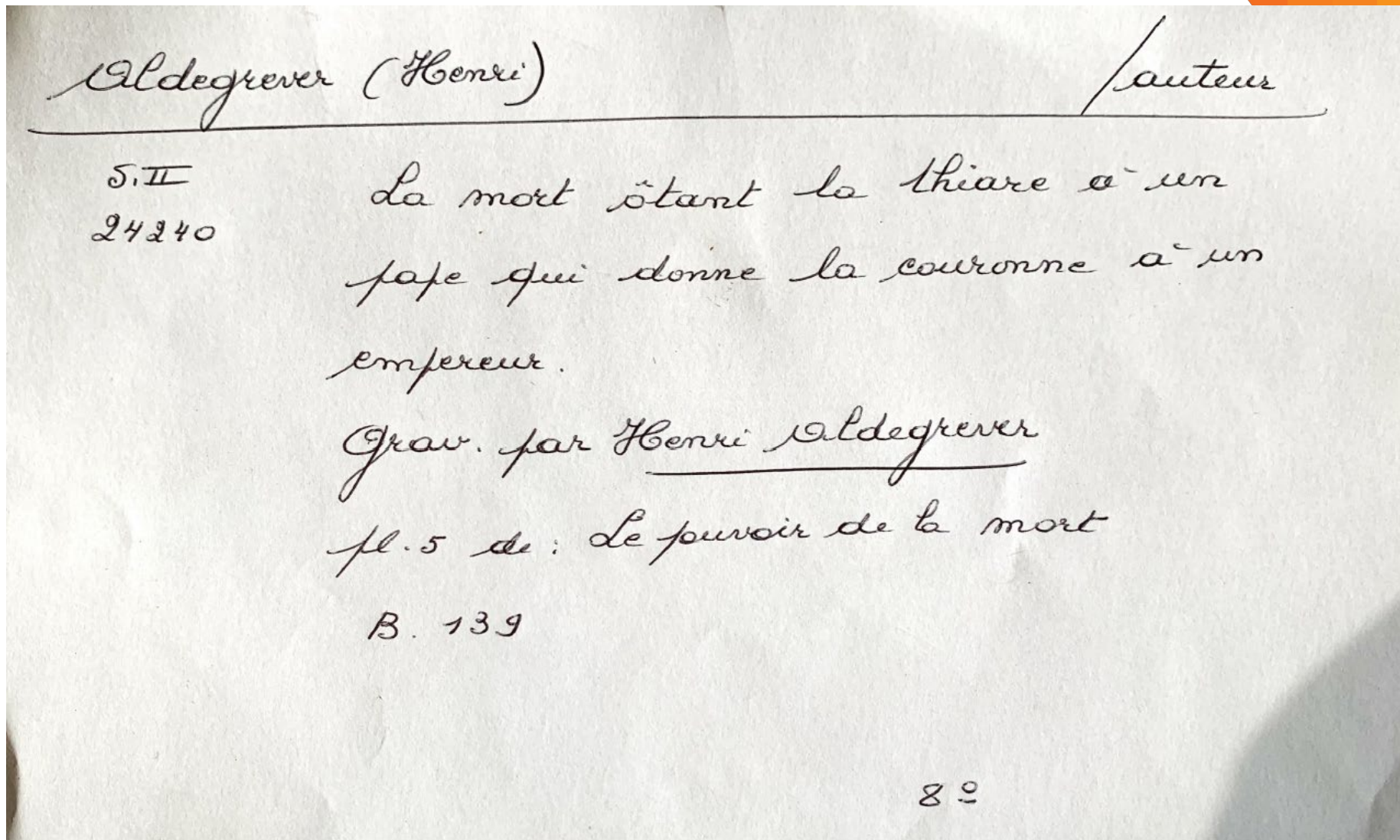


Other projects (1) : Periodicals

- Table Detection: The AI model can automatically detect and extract tables from documents.
- Automatically create bibliographic records for each article.
- Used in a school library to index articles at the article level, enabling students to quickly find information relevant to their research topics.



Other projects (3) : handwritten library cards



Part 2

Using Power Apps for Creating an RDA Application Profile, with a Validation Method

RDA Application Profile with validation file

































- May 2024 EURIG Annual Meeting in Helsinki
- During meeting we talked about RDA Application Profiles, but I also received an email from Péter Király
- QA Catalogue : validates MARC21 data of KBR:
 - <https://qa-data.kbr.be/>

records without issues

with

4,348,142 (90.97%)

431,645 (9.03%)

	instances	records	%
record level issues	1,602	1,591  	0.03
undetectable type (5 variants) [+]	1,580	1,580  	0.03
invalid linkage (4 variants) [+]	22	11  	0.00
control field level issues	537,138	204,675   	4.28
obsolete code (4 variants) [+]	21,097	21,097  	0.44
invalid code (452 variants) [+]	98,622	59,526  	1.25
invalid value (207 variants) [+]	417,419	167,137   	3.50
data field level issues	53,412	53,190  	1.11
missing reference subfield (880\$6) (1 variants) [+]	62	24  	0.00
repetition of non-repeatable field (14 variants) [+]	50,598	50,487  	1.06
undefined field (7 variants) [+]	2,752	2,679  	0.06
indicator level issues	268,674	162,752   	3.41
obsolete value (2 variants) [+]	33	33  	0.00
non-empty indicator (2 variants) [+]	8	7  	0.00
invalid value (63 variants) [+]	268,633	162,721   	3.40
subfield level issues	103,113	63,766  	1.33
undefined subfield (15 variants) [+]	3,422	1,548  	0.03
invalid classification reference (6 variants) [+]	20 834	12 278  	0.26

RDA Application Profile with validation file

- **Email: promoting a new article he wrote about ‘Shacl4Bib’**

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.

<https://arxiv.org/abs/2405.09177>


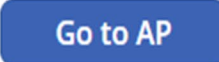
RDA Application Profile with validation file

- Idea: Create an application (Power Apps) that we can use to create an RDA Application Profile, but that also creates a custom validation method based on the information of the RDA Application Profile.
- For example 'Title of manifestation' in field 245\$a is mandatory and not repeatable
- Information is added in application
- Application creates the Shacl4Bib custom validation file →

```
format: MARC
fields:
- name: 245$a
path: 245$a
rules:
- id: 245$a.minCount
  minCount: 1
- id: 245$a.maxCount
  maxCount: 1
```

Example: has type of binding (manifestation)

- First: Search for the RDA element you want to add or modify
- using the selection and/or search bar

manifestation  type of b 

manifestation - has type of binding

Relates a manifestation to a method used to bind a published or unpublished manifestation.



Example: has type of binding (manifestation)

- Adjust settings of element

AddToAP	DocumentsTypes	EntityType
Yes	Books	manifestation
*label_en	where recorded (Rule + field LMS)	MARC21 code
has type of binding	M21:1	340\$I
Recording method (US/S/ID/IRI)	VES	Repeatable
ID	RDA Type Of Binding	Yes
Notes	SES	Obligatory
		No
pattern		
^(rdatb: kbr)		

Example: has type of binding (manifestation)

- Overview of elements in Application Profile
- Generate Shacl4Bib validation file

	manifestation		manifestation	Books	Refresh
Books ,	manifestation	has title of manifestation : Relates a manifestation to a nomen that is an appellation of manifestation in natural language and phrasing used in common discourse.	M21:1 : 245\$a	Recording Method : US	>
			Not repeatable		
			Obligatory		
Books ,	manifestation	has type of binding : Relates a manifestation to a method used to bind a published or unpublished manifestation.	M21:1 : 340\$I	Recording Method : ID	>
			Repeatable	VES : RDA Type Of Binding	
			Not obligatory		

[Add property to AP](#) [Generate Custom validation file \(Shacl4Bib\)](#) [Export AP \(Excel\)](#)

Power Apps (V2) ...

Initialize variable ...

List rows that are in Application Profile ...

*Table name: kbr_RDA_APs

Select columns: Enter a comma-separated list of column unique names to limit which columns :

Filter rows: cr6fc_addtoap eq true

For each row

*Select an output from previous steps: value x

Add rules to variable ...

*Name: Rules

*Value:

- name: MARC21 code x
- path: MARC21 code x
- rules: if(...) x if(...) x

Add an action

- Rules:
 - If 'obligatory' is 'Yes' → minCount 1
 - If 'repeatable' is 'No' → maxCount 1
 - If 'pattern' is filled in → pattern

Create SHACL ...

*Inputs:

- format: MARC
- fields: Rules x

```
1 format: MARC
2 fields:
3   - name: 3401
4     path: 340$1
5     rules:
6       - id: 340$1.pattern
7         pattern: "^(rdatb:|kbr)"
8   - name: 300a
9     path: 300$a
10    rules:
11      - id: 300$a.minCount
12        minCount: 1
13      - id: 300$a.pattern
14        description: no more 'p.' but 'pages'. Also error = N. gepag. N. pag. N.p. Non pag.
15        and:
16          - minCount: 1
17          - not:
18            - pattern: ^.*\d+ (p|gepag|pag)\.?\s*$
19              debug: false
20   - name: 300b
21     path: 300$b
22     rules:
23       - id: 300$b.pattern
24         description: no more 'ill.' but 'illustrations'
25         not:
26           - pattern: ^.*?ill\..*?$
27   - name: 300c
28     path: 300$c
29     rules:
30       - id: 300$c
31         minCount: 1
32   - name: 300e
33     path: 300$e
34     rules:
35       - id: 300$e
36         maxCount: 0
37   - name: 264a
38     path: 264$a
39     rules:
40       - id: 264$a
41         minCount: 1
```


Custom validation

This page displays the result of validation against a customized set of rules, which reflects the requirements of a particular library. The rules should be expressed with Shape Constraints Language which is a domain-specific language for defining constraints against data elements. The rule set could be written in a YAMPL or JSON configuration file.

(Download the custom ruleset: [kbr-full.yaml](#).)

path	criteria		number of records		
			failed	passed	NA
340\$I	pattern=^(rdatb: kbr),		0	120,276	4,659,510
040\$a	minCount=1,		700,197	4,079,589	0
040\$a	pattern=^BE-KBR00.*\$,		13,179	4,066,410	700,197
041\$a	minCount=1,		912,746	3,867,040	0
041\$b	maxCount=0,		1,705	4,778,081	0
041\$h	maxCount=0,		73,940	4,705,846	0
044\$a	minCount=1,		1,279,536	3,500,250	0
245\$a	minCount=1,		14,483	4,765,303	0
245\$h	maxCount=0,		318,781	4,461,005	0
245\$b	maxCount=0,		1,190,968	3,588,818	0
245\$c	maxCount=0,		2,378,352	2,401,434	0

resource Description & Access

With export list of identifiers (csv)

300\$a no more 'p.' but 'pages'. Also error = N. gepag.

N. pag. N.p. Non pag.

and(minCount=1, not(pattern=^.*\d+(p|gepag|pag)\.?\s*\$, debug=false)),



1,826,064  1,106,018  1,847,705 

300\$b no more 'ill.' but 'illustrations'

not(pattern=^.*?ill\..*?\$),



753,587  960,207  3,065,993 

Correct records using Python script

```
if tag == '300':
    new300a = ''
    new300a2 = ''
    new300b = ''
    format = ''
    for subfield in datafield:
        subfield_list = subfield.attrib
        code = subfield_list.get('code')
        if code == 'a':
            collatie = subfield.text
            if collatie[len(collatie) - 3:] == ' p.':
                string1 = collatie[:len(collatie) - 2]
                if lang_code == 'fre':
                    new300a = string1 + 'pages'
                elif lang_code == 'eng':
                    new300a = string1 + 'pages'
                elif lang_code == 'dut':
                    new300a = string1 + "pagina's"
                elif lang_code == 'ger':
                    new300a = string1 + "Seiten"
            subfield.text = new300a
```

RDA Application Profile with validation file

- **In development , but possible results:**
 - Maintain the application profile in application (linked to Dataverse table)
 - Export the AP in Excel or PDF formats for documentation.
 - Ability to create a custom validation file using Shacl4Bib, which can be uploaded to the QA Catalog for automated validation.
 - Daily updates ensure that records are continuously validated against the custom validation file.

Questions?

Hannes.Lowagie@kbr.be

<https://www.linkedin.com/in/hanneslowagie/>