# From Bias to Transparency

#### **Ethical Imperatives in AI-Based Library cataloging**

#### Hannes Lowagie WLIC 2023 Satellite Meeting

Universal Bibliographic Control at the Crossroads : The Challenges of Unifying IFLA Bibliographic Standards

# **Universal Bibliographic Control**

- Standardized approach: output, cataloging rules
- Challenge due to different cultural perspectives and diverse interpretations, especially in subject indexing
- Proposition via AI and linked subject indexing



#### Mauro Guerrini, 2022

- "Who knows what the future will bring us? Perhaps, we are still at the beginning of the digital revolution. Precisely in the field of metadata and authority control, we could expect developments and surprises from alternative technologies on machine learning or artificial intelligence, a tool that promises to be very useful; a tool that takes nothing away from the cataloguer's judgment, which remains a fundamental intellectual activity."
- Yes, tools available
- Presentation of Power Platform Wednesday 23/08 at Rotterdam
- Subject indexing  $\rightarrow$  'tagging' texts

#### Subject indexing using AI

#### • Database with two columns: texts and 'tags'

	A	В
		L'histoire des institutions administratives françaises s'inscrit dans une remarquable continuité que peu d'auteurs ont, jusqu'à présent, mise en
	Public administration	valeur. Des travaux récents montrent pourtant que notre administration plonge ses racines les plus profondes au Moyen Âge. Les ministres
	Public administration	d'aujourd'hui sont les successeurs des secrétaires d'État de l'Ancien Régime, eux-mêmes descendants des notaires-secrétaires qui entouraient le
1		roi à l'époque féodale.
		Ce livre de petit format réunit quelques-unes des réflexions les plus pertinentes et les plus actuelles de Paul Valéry (1871-1945) sur la politique.
		Lui qui ne fut d'aucun parti, ni de droite ni de gauche, et qui voulut, toute sa vie, conserver son indépendance, a rapidement pris les mesures du
2		système démocratique auquel il se résignait plutôt qu'il ne l'approuvait
	Human rights	Peu connu en France, Thomas Paine fut pourtant député de la Révolution française et ardent défenseur des droits de l'homme. Après avoir été
		parmi les organisateurs de l'Indépendance américaine en 1776, il a rejoint Paris pour défendre, par la plume et par le verbe, les valeurs
3		fondamentales de liberté, d'égalité et de fraternité, et leur inscription juridique dans la Déclaration des droits de l'homme et du citoyen
	Wellbeing	Des rituels de respiration pour apaiser ses émotions, booster son bien-être et se transformer ! La respiration est au cœur de la vie ! C'est elle qui
		apporte l'oxygène et l'énergie de bouger, c'est elle qui équilibre le système nerveux et, par-là, les émotions. Elle agit même sur le sommeil et sur
4		la digestion. Lorsqu'on respire, on revient à soi. La respiration permet de se reconnecter à son corps, à soi et à ses envies profondes
		Les bases fondamentales et les grands concepts de la statistique en psychologie explicités et mis en scène dans un manuel clair et visuel, illustré
	Dauchology	par 150 photos, graphiques et tableaux. Dans chaque chapitre : zoom sur les notions essentielles ; mise en avant de définitions et de renvois vers
	Psychology	des sites web ; développement d'applications et de documents interactifs (exercices corrigés, QCM, webographies). Cette 3e édition bénéficie
5		aussi de compléments en ligne (vidéos).
6		
7		

# **Potential Pitfalls: fictitious example**

Attributed:
Environmental Monitoring
Internet of Things
Attributed:
Data Privacy
Internet of Things
Suggested:
Internet of Things

# Subject indexing using AI: solutions to avoid wrong interpretations

- Diverse Training Data
- Fine-tuning and customization
- Human-in-the-Loop approach
- Evaluation and Monitoring
- Transparency and Documentation



#### International collaboration

- Do we want future where each NBA will train its own model, or can we collaborate?
- Can we create one model and thus harmonize 'input' (instead of focusing on a standardized 'output')
- First idea: one worldwide 'model' for subject indexing
- However...



# **Embracing different interpretations**

• One world but different interpretations, even on basic concepts like 'poverty', 'youth',

KBR 1

	Books about people that are	NBA A	NBA B	NBA C
	15 years old		Childhood	Childhood
	16 years old	Adulthood	Young Adulthood	Childhood
	17 years old			Adolescence
	18 years old			
	19 years old			
	20 years old		Adulthood	
	21 years old			Adulthood
	22 years old			
Koester de tijd Protégeons le te	23 years old			

# **Embracing different interpretations**

- Avoid imposing a singular interpretation as the 'true' one
- KBR: based on data.bnf.fr:
  - export summaries of books related to subject x
  - Use data to train data for that concept
  - Result: dataset KBR is a French, European model, mostly based on manual efforts French cataloguers. We have to be aware of that



# **Embracing different interpretations**

#### IFLA National Bibliographic Register

- 20% local classifications,
- 60% local subject vocabulary
- Value of local classifications and subject vocabularies



#### Main question

 "How can we achieve a universal way of organizing and accessing information with respect to each culture's different interpretations, resulting in an improved 'universal' discoverability of nation's publications?"

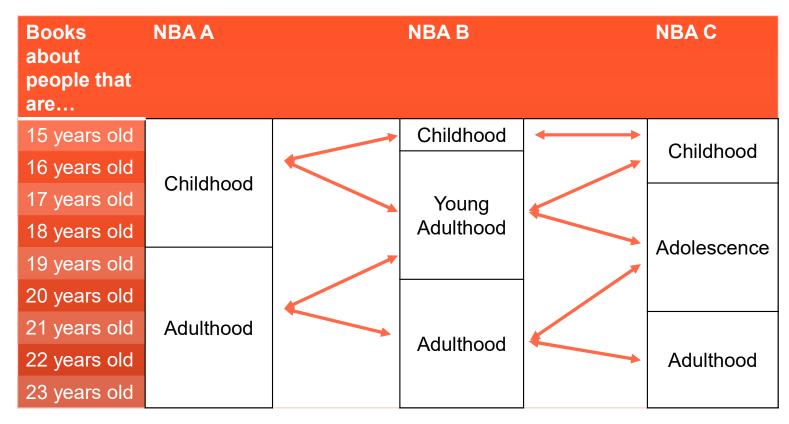


#### Proposition

- Unified interconnected knowledge graph by combining and mapping local classifications and subject vocabularies
  - Theoretical, challenging, complex, maybe impossible but worth investigating
  - Embracing diversity of cultural perspectives



# Mapping



# Proposition

- Links can be created by comparing classifications of same 'works' (ifla-Irm)
- Research Project BELTRANS
  - translated works from KBR, BnF, BL, KBNL
  - same works, different subject indexing



- Establish meaningful relationships between the diverse classification schemes
- Create one dataset



#### Challenges

- Conflicts in interpretations
- Ambiguities
- Scalability
- --> shared ontology



#### **Advantages**

#### Researchers

- Extensive and interconnected Knowledge Base

#### Librarians

- Streamline cataloging processes
- Environment of collaboration and knowledge exchange
- Better serve their users
- Part of a global knowledge-sharing network

#### Users

- Acces a wider array of resources beyond their local library
- Enriching understanding of diverse cultures, ideas and perspectives

#### **Advantages**

- Potential to foster cross-cultural information retrieval
- Users can navigate through interconnected web of concepts
  - Uncovering related materials
  - Deeper understanding of diverse viewpoints
  - Access a wide range of resources
  - Navigate and explore information in a manner that aligns with their unique context and preferences
- Users can access materials relevant to their interests, regardless of the originating library's classification
  - Ethical considerations



#### **Ethical considerations**

- Cultural sensitivity
- Diversity and Inclusion
- Bias and Fair Representation

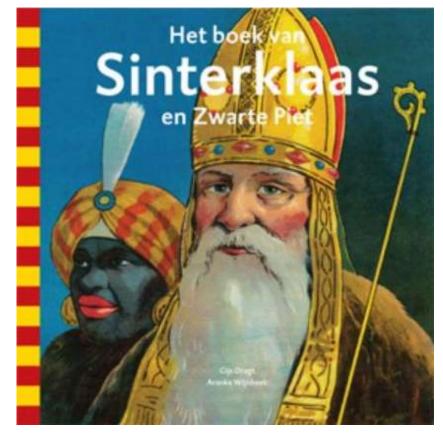


#### **Zwarte Piet**





#### Het Boek van Sinterklaas en Zwarte Piet



**KBR Koester de tijd** Protégeons le temps **ISBN** 978-9490470029

NBAA = 'Saint Nicholas', 'Children', 'Saints'

NBAB = "Racial representation"

- $\rightarrow$  Meaningful to create a link between both subject terms
- → Citizens of NBAA can see that their indexations is linked to 'racial representation'
- → When one searches 'racial representation' → also that books as search result

#### Piet





# **Final ethical considerations**

#### Artificial Intelligence

- Do not trust AI
- Create and maintain your own training set (and publish it)
- Opportunity: train a 'universal' brain to interpret texts ('input')
- Can only using proposed 'mapping' between local classification schemes and vocabularies (respect local interpretations)



# **Final ethical considerations**

#### Classification and subject indexation

- Cultural relativist
- Finding a balance between respecting cultural differences and 'correcting' a cultural viewpoint (for example 'Zwarte Piet').
- Foundational framework
  - Universal Human Rights
  - Inclusivity
- Proposed mapping does not correct, but can expose possible harmful terms and offer diverse insights

## Conclusion

- Unified and interconnected knowledge graph by combining different local classifications and subject vocabularies through skos links.
  - Diversity of cultural perspectives
  - Harmonious network of interconnected concepts

#### • Al-algorithms can play a pivotal role in

- Recognizing patters and relationships
- Automatic subject indexing
- Ethical considerations

# **Open questions**

- Is it possible to collaborate internationally to create a universal model for subject indexing using artificial intelligence?
- Is it possible to 'map' different classifications and subject vocabularies?
- If a NBA uses AI for the automated subject indexing, should it publish its training data? Should the NBA indicate that subject indexing was made by AI?
- If a NBA identifies a harmful term or potentially offensive language in another CA's classification scheme or subject vocabulary, is there a mechanism for communication? If yes, how can this communication take place?
  Furthermore, should a NBA reflect on such observations and remarks?