Toward a Framework for Visual Nomen

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NKOS @ DCMI 2022 | October 7, 2022
Agenda

01 Background and Aims
02 Literature Review
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04 Dimensions of Visual *Nomen*
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Background and Aims

A nomen (LRM-E9) is an “association between an entity and a designation that refers to it” (Riva et al., 2017, p. 31)

in which an arbitrary appellation, designation, or combination of signs or symbols is assigned to an instance of an entity (any Res, or thing) based on cultural or linguistic convention.
Background and Aims

Different *nomen* may also refer to the same entity within particular contexts, such as how

- a subject term,
- a classification number, and
- an identifier (e.g., ID code or URI)

all variously refer to the same concept in contextually different forms and ways.
Background and Aims

LRM specifies explicitly how to make alphanumerical, orthographic, linguistic, and multilingual references to entities (e.g., attributes for *Language* [E9-A7] and *Script* [E9-A8]).
Background and Aims

• How do non-linguistic or non-alphanumeric signs or symbols act as *nomen* to identify entities?

• What details or attributes are relevant to describe and classify such *nomen* to integrate them into information systems?
Background and Aims

The goal of this research is to examine aspects that would be salient in the consideration of supralinguistic ways of referencing entities using visual *nomen*. 
Background and Aims

Visual *nomen* are symbolic representations of entities encountered through visual perception in which the representation of entities is not dependent solely on linguistic or alphanumeric features or conventions.

Examples would include symbols, logos, representative images, video or motion picture depictions, or visual elements which are assigned to reference, designate, or elucidate the specific identity of any *res*. 
Literature Review
Development of the Functional Requirements for Subject Authority Data (FRSAD) (Zeng et al., 2011)

- recognized the inherent semiotic relationships in subject conceptualization (semiotic triangle) (Ogden & Richards, 1923)

- separated *thema* (subject) from *nomen*

- supported multilingual (contextual) representation for the same concept
History of the Nomen entity

- consolidation of the FR models in LRM
- strengthened semiotic implications
  - *nomen* is assigned by *agent* to designate *res* (any thing)
- independence and connected natures of *nomen* and *res* (context) (Gemberling, 2016)
- *nomen* is not an attribute, but is an entity that has attributes unto itself (Žumer & Zeng, 2016)
- needed for information systems (authority control)
• LRM *nomen* and its conceptual bases (FRSAD, Semiotic Triangle theory) (Riva et al., 2017; Ogden & Richards, 1923; Zeng et al., 2011)

• Qualitative Instrumental Case Study (Creswell & Poth, 2018)

• Multiple (Comparative) Cases (Yin, 2018)

• Constant Comparative Method (Charmaz, 2014)

• Structured, Focused Comparison (George & Bennett, 2005; Mahoney, 2004)
Dimensions of Visual Nomen

- “Nomen” (Program for Cooperative Cataloging, 2020)
- “Nomen explained” (Zeng, 2020)
- “Using Visual Nomen for Enhancing Semantic Consistency, Communication, and FAIRness of Open Cultural Heritage Resources” (Zeng, 2022)
**LRM-defined attributes of nomen**

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td># Property Irmer:E9A1 &quot;has category of nomen&quot;</td>
<td>&quot;Relates a nomen to a type to which the nomen belongs&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A2 &quot;has nomen string&quot;</td>
<td>&quot;Relates a nomen to the combination of signs that forms an appellation associated with an entity through the nomen&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A3 &quot;has scheme&quot;</td>
<td>&quot;Relates a nomen to the scheme in which the nomen is established&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A4 &quot;has intended audience of nomen&quot;</td>
<td>&quot;Relates a nomen to a class of users for which the nomen is considered appropriate or preferred&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A5 &quot;has context of use&quot;</td>
<td>&quot;Relates a nomen to information as to the context(s) in which a nomen is used by the agent who is referred to through it&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A6 &quot;has reference source&quot;</td>
<td>&quot;Relates a nomen to a source in which there is evidence for the use of the nomen&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A7 &quot;has language of nomen&quot;</td>
<td>&quot;Relates a nomen to the language in which the nomen is attested&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A8 &quot;has script&quot;</td>
<td>&quot;Relates a nomen to the script in which the nomen is notated&quot;</td>
</tr>
<tr>
<td># Property Irmer:E9A9 &quot;has script conversion&quot;</td>
<td>&quot;Relates a nomen to the rule, system, or standard that was used to create a nomen that is derived on the basis of another, distinct nomen notated in another, distinct script&quot;</td>
</tr>
</tbody>
</table>

IFLA, 2022  
[https://www.iflastandards.info/lrm/Irmer#E9](https://www.iflastandards.info/lrm/Irmer#E9)
LRM-defined attributes of *nomen*

Irmer:E9A1 “has category of nomen”

*categories for text-based nomen and visual nomen (types)*

Irmer:E9A2 “has nomen string”

“...combination of signs that forms an appellation associated with an entity...“

“The string involved in a nomen can be expressed as a notation in any form, such as a combination of signs within a writing system, chemical structure symbols, mathematical notation, or by any other kind of sign, such as sounds, etc."

*a wide definition of “string”*

Irmer:E9A3 "has scheme"

*controlled vocabularies for visual nomen?*

IFLA, 2022: Riva et al., 2017

https://www.iflastandards.info/lrm/Irmer#E9
LRM-defined attributes of *nomen*

lrmer:E9A4 "has intended audience of nomen“

user communities and user choice for whom the visual nomen is intended

lrmer:E9A5 "has context of use"

"Relates a nomen to information as to the context(s) in which a nomen is used by the agent who is referred to through it“

“The context of use attribute includes domains associated with a nomen used by an agent.”

examples like genres, subjects, domains, or situations of use or applicability

lrmer:E9E6 "has reference source“

“...a source in which there is evidence for the use of the nomen"
Further dimensions of visual *nomen*

**Form or formal nature**
from concrete to abstract
- how directly is visual language (Panofsky, 1939) employed in depicting or representing a res
- the “isness” of information representation (Hjørland, 2017)


[Colors chart]

[Source: https://ingridsnotes.wordpress.com/2014/02/04/the-color-thesaurus/]

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Form as a dimension of visual *nomen*

Pictograms/pictographs
- based on their resemblance to their real-world physical referents
  - international signage (Hassan, 2015)
  - emoticons/emoji (Giannoulis & Wilde, 2020)
Form as a dimension of visual *nomen*

**Pictograms, practically**

- 9 Pictograms in the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
- Cho et al., 2008 proposed a “*semantic relevance measure* which calculates how relevant a pictogram is to a given interpretation”
- Use of pictographs as a communication technology for people with intellectual disabilities (Sevens, 2018)

[Link to OSHA Pictogram Page](https://www.osha.gov/sites/default/files/publications/OSHA3491QuickCardPictogram.pdf)
Form as a dimension of visual *nomen*

Pictograms, practically

- ISO 7001:2007 – Public information symbols
- United States Department of Transportation (DOT) Symbol Signs, in partnership with the American Institute of Graphic Arts (AIGA)
- ISO 7010:2019 – Registered safety signs
- Color / Pictogram / Text:
  - ISO 3864 - Graphical symbols — Safety colours and safety signs
  - ANSI Z535
Form as a dimension of visual *nomen*

**Ideograms/Ideographs**

- represent more abstract concepts
- more formally complex and language-independent
- rely on either physical similarity or conventional use of visual elements to communicate concepts
Form as a dimension of visual *nomen*

Ideograms, ideally

- Numerals
- Mathematical symbols
- Currency symbols
- Alchemical symbols
  - Unicode and the Chymistry of Isaac Newton project
- Western zodiac symbols

https://webapp1.dlib.indiana.edu/newton/reference/symbols.do
Form as a dimension of visual *nomen*

Symbols and emblems

- Online Coins of the Roman Empire (OCRE) project
- Monogram symbols on Roman coinage

[https://numismatics.org/ocre/symbols](https://numismatics.org/ocre/symbols)
Form as a dimension of visual *nomen*

Symbols and emblems

- United States Department of Veterans Affairs (VA) National Cemetery Administration Emblems of Belief
  - for placement on government headstones and markers

https://www.cem.va.gov/hmm/emblems.asp
Form as a dimension of visual *nomen*

**Notation systems**

- chemical structural formulas
  - graphic representation of the molecular structure of a chemical compound showing the order of atoms and their chemical bonds
- Chemical Abstract Service (CAS)

[Link to the image](https://commons.wikimedia.org/wiki/File:Cascommonchemistry2022.png)
Form as a dimension of visual nomen

Notation systems

- musical notation
- dance notation

Form as a dimension of visual *nomen*

Representation of abstract concepts

Iconography

“ofness” and “aboutness” cultural narratives interpretation
Cultural context as a dimension of visual *nomen*

Shared and differing aspects of representation across systems of gestures and non-verbal signs (expanded notion of “nomen string”)

- Sign languages
- Hand signals
  - Especially in sports domains
- Facial expressions and body language
- Movements in social, ritual, and religious practice and types of performance
Communicative and interpretive context as a dimension of visual *nomen*

Nautical/maritime signal flags in the International Code of Signals (ICS) have context-dependent meanings within the same domain:

- alphabet letters
- signal for specific concepts
- used in combination to represent additional concepts or to complement (qualify) messages from other flags (Medical Signal Code)
Communicative and interpretive context as a dimension of visual *nomen*

Context-dependence for the same “string” (e.g., user choices on a website):

- place, nation
- nationality, identity
- language, dialect
Temporal context as a dimension of visual *nomen*

Time-span, evolution, and validity: *nomen* ontogeny

https://www.logaster.com/blog/att-logo/

https://en.wikipedia.org/wiki/List_of_flags_of_the_United_States
Typicality as a dimension of visual nomen

Representation and reification

• Made to serve as or considered to be (Buckland, 2018) a nomen insofar as it is representative of a res in some conventional or socially constructed way

• EwaGlos: European Illustrated Glossary for Conservation Terms of Wall Painting and Architectonic Surfaces
Typicality as a dimension of visual nomen

Representative images in Getty’s Art and Architecture Thesaurus (AAT)
Typicality as a dimension of visual *nomen*

Diagnosis and treatment of medical conditions

- Professional medical training
- Public health strategies
  - Centers for Disease Control and Prevention (CDC) guidance on the 2022 Monkeypox outbreak ([https://www.cdc.gov/poxvirus/monkeypox/symptoms/index.html](https://www.cdc.gov/poxvirus/monkeypox/symptoms/index.html))
    - Signs and Symptoms
      - Monkeypox Rash Photos
Representation as a dimension of visual *nomen*

https://americanart.si.edu/artwork/queen-hamlet-3

http://edan.si.edu/saam/id/object/1973.28.1
Representation as a dimension of visual *nomen*
Technical aspects as a dimension of visual nomen

Media types
- Still or moving images
- File types
- Extents and dimensions
- Durations

Created (e.g., illustrated) or obtained from the real world (photographed, recorded)

Fundamental for supporting information systems beyond linguistic terms with the use of visual controlled vocabularies

https://www.youtube.com/watch?v=jaVSVtPRwlA
Ethics as a dimension of visual *nomen*

Ethics of access
- Accessibility beyond language: draw, move (gesture, sign, dance), view/see, touch
- Multivocal and multimodal representation and access
- Cultural hospitality and affordances for user preference

Ethics of representation
- Misrepresentation and systemic harm (vulnerable communities)
- Copyright, ownership, and intellectual property
Toward a Framework

Identifying salient attributes, dimensions, and aspects

- Controlled vocabularies matching visual *nomen* to concepts/entities
- Classification systems for visual *nomen*
- Ontology or semantic markup standard to link data to visual representations
- Studies to understand effective use of visual *nomen* for user groups
- Support affordances for user choice in systems using visually-based interfaces
  - Beyond multilingual systems toward supralinguistic and multimodal systems
  - Enabling access for users without a need for linguistic representation
  - Enabling additional layers of context and discoverability for other users
Thank You

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