Methodological Considerations for Developing the *Art & Architecture Thesaurus* in Chinese and its Applications

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AAT in Chinese Language
Developed by the Academia Sinica Center for Digital Cultures (ASCDC) of Taiwan
http://aat.teldap.tw/

ITWG
The International Terminology Working Group

1. 2008.07
2. 2009.07
3. 2010.08
4. 2011.11
5. 2012.01
6. 2013.01
7. 2014.09
8. 2016.08
9. 2017.08
10. 2019.02
11. 2020.02
AAT as a Knowledge Tree

- AAT is a multilingual and hierarchical thesaurus structured in 7 facets and 21 hierarchies
- Current totals: 57,500 records (2016)
- Includes generic terms to describe art, architecture, design, artifacts, archival materials, archaeology, visual surrogates and other material culture

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**Facets and Hierarchies**

<table>
<thead>
<tr>
<th>ASSOCIATED CONCEPTS FACET (關聯概念層面)</th>
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<tbody>
<tr>
<td>Associated Concepts (關聯概念)</td>
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<thead>
<tr>
<th>PHYSICAL ATTRIBUTES FACET (物理特質層面)</th>
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<tbody>
<tr>
<td>Attributes and Properties (物理與屬性)</td>
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<tr>
<td>Conditions and Effects (情況與作用)</td>
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<tr>
<td>Design Elements (設計元素)</td>
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<td>Color (色彩)</td>
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<thead>
<tr>
<th>STYLES AND PERIODS FACET (風格與時代層面)</th>
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<td>Styles and Periods (風格與時代)</td>
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<table>
<thead>
<tr>
<th>AGENTS FACET (代理者層面)</th>
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<tbody>
<tr>
<td>People (個人)</td>
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<tr>
<td>Organizations (組織)</td>
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<td>Living Organisms (生物)</td>
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<table>
<thead>
<tr>
<th>ACTIVITIES FACET (活動層面)</th>
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<tbody>
<tr>
<td>Disciplines (學科)</td>
</tr>
<tr>
<td>Functions (功能)</td>
</tr>
<tr>
<td>Events (事件)</td>
</tr>
<tr>
<td>Physical and Mental Activities (身體與心智活動)</td>
</tr>
<tr>
<td>Processes and Techniques (過程與技術)</td>
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<tr>
<th>MATERIALS FACET (材料層面)</th>
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<tr>
<td>Materials (材料)</td>
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<tr>
<th>OBJECTS FACET (物件層面)</th>
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<tbody>
<tr>
<td>Built Environment (建築環境)</td>
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<tr>
<td>Components (組件)</td>
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<tr>
<td>Furnishings and Equipment (裝飾與設備)</td>
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<tr>
<td>Object Genres (物件類型)</td>
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<tr>
<td>Object Groupings and Systems (物件群集與系統)</td>
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<tr>
<td>Visual and Verbal Communication (視覺及語言傳達)</td>
</tr>
</tbody>
</table>
Record types in AAT: Concept

(1) Preferred name
(2) Scope note
(3) Equivalence Relationships
(4) Hierarchical Relationships
(5) Associative Relationships
(6) Sources of concept term

Indication of term’s historical usage

- In use from ca. 1530
- Used from the mid-16th century

Core information in AAT concept
(1) Preferred name
(2) Scope note
(3) Equivalence Relationships
(4) Hierarchical Relationships
(5) Associative Relationships
(6) Sources of concept term
Chinese-Traditional Version of AAT: The Purpose

Western Art Resource

- Getty’s AAT
  - Make Western Art Accessible to Western Users

Chinese Art Resource

- AAT-Taiwan
  - Mapping
    - Controlled Vocabularies of Chinese Art
      - Make Chinese Art Accessible to Western Users

Western Users

Chinese Users

AAT-Taiwan

- Translating
  - Getty’s AAT
    - Make Western Art Accessible to Chinese Users

- Contributing
  - AAT-Chinese

Digital Archives Thesaurus (DAT)

- Structuring
  - Keywords from Taiwan Digital Archives
    - Make Chinese Art Accessible to Chinese Users

AAT-TAIWAN website: [http://aat.teldap.tw/](http://aat.teldap.tw/)
Working Model of AAT-Taiwan

From English to Chinese
- Term Collection
- Semantic Analysis
- Equivalence Mapping
- Research on KOS Construction
- Expert Group
- Concept Construction
- Translation
- Proofreading
- Disambiguation

From Chinese to English
- Term Collection
- Semantic Analysis
- Equivalence Mapping
- Research on KOS Construction
- Expert Group
- Concept Construction
- Translation
- Proofreading
- Disambiguation

Scope Note
- Creation
- Proofreading
- Disambiguation
From English to Chinese

Make Western Art Accessible to Chinese Users
Add on Local Images

肖像畫 portraits

肖像畫 (P.U. 護國西愛-豎好, D.U. U)
肖像 (U 你長中意-豎好, UF.U.U)
hsiao hsiang hua (P.U. 慕氏牙醫-豎好, UF.U.U)
xiao xiang hua (P.U. 慕氏牙醫-豎好, UF.U.U)
xiao xiang hua (P.U. 慕氏牙醫-豖好围, UF.U.U)
portraits (P.U. 護國西愛-豖好, UF.U.U)

呼び、Representations of real individuals that are intended to capture a known or supposed likeness, usually including the face of the person. For representations intended to be anonymous, or of fictional or mythological characters, see "figures (representations)."

相關概念:
distinguished from...肖像畫(圖像)

其他範圍注:

引文:
[肖像畫 portraits(編號300015637)]：《藝術與建築字典》
http://aat.teldap.tw/AATFullDisplay/300015637（2018/06/10瀏覽）
From Chinese to English

Make Chinese Art Accessible to Western Users
Conceptual Mapping of the NPM Terms to AAT

- The study takes a total of 2100 Chinese controlled vocabulary terms from the National Palace Museum in Taiwan, and a total of 35,314 English concepts of AAT, and performing semantic mapping between Chinese and English terms. The study asked research questions including:
  
  A. To what degree of semantic interoperability can be achieved between the two controlled vocabularies?
  
  B. What patterns of interoperability are involved in the field of Chinese art in the bilingual conceptual structure?

Example of mapping sheet between NPM and AAT terms
# Results of Mapping Types Between NPM and AAT

<table>
<thead>
<tr>
<th>Code</th>
<th>Mapping Type</th>
<th>Quantity (percentage)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM</td>
<td>Hierarchical (narrower to broader)</td>
<td>1327 (63.19%)</td>
<td>剔犀 (ti xi) BM lacquering (A12067)</td>
</tr>
<tr>
<td>=EQ</td>
<td>Exact simple equivalence</td>
<td>638 (30.38%)</td>
<td>仰韶文化 (yang shao wen hua) =EQ Yangshao (A02002)</td>
</tr>
<tr>
<td>EQ</td>
<td>Cumulative compound equivalence</td>
<td>52 (2.48%)</td>
<td>塔 (ta) EQ pagodas</td>
</tr>
<tr>
<td>~EQ</td>
<td>Inexact simple equivalence</td>
<td>37 (1.76%)</td>
<td>后妃 (hou fei) ~EQ empresses (P04003)</td>
</tr>
<tr>
<td>EQ+</td>
<td>Intersecting compound equivalence</td>
<td>33 (1.57%)</td>
<td>春景 (chun jing) EQ springs + scenes (P03001)</td>
</tr>
<tr>
<td>NM</td>
<td>Hierarchical (broader to narrower)</td>
<td>9 (0.43%)</td>
<td>玉石器 (yu shi qi) NM jades (objects) (A04004)</td>
</tr>
<tr>
<td>RM</td>
<td>Associative mapping</td>
<td>4 (0.19%)</td>
<td>臺閣 (tai ge) RM pavilions (P14002)</td>
</tr>
<tr>
<td></td>
<td><strong>總計</strong></td>
<td><strong>2100 (100%)</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Interoperability of Conceptual Structures for NPM in AAT

<table>
<thead>
<tr>
<th>Vocabularies</th>
<th>Structures</th>
<th>Specific category in AAT</th>
<th>No specific category in AAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completely covered in AAT</strong></td>
<td>Pattern 1</td>
<td>A02 考古學文化 (13 values)</td>
<td>Archaeological Culture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A17 時代 (66 values)</td>
<td>Chinese Periods</td>
</tr>
<tr>
<td>Incomplete covered in AAT</td>
<td>Pattern 2</td>
<td>A03 窯系 (19 values)</td>
<td>Chinese Ceramic Style</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chinese Ceramic Glazes</td>
</tr>
<tr>
<td>None covered in AAT</td>
<td></td>
<td></td>
<td>P02 中國繪畫技法 (34 values)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Techniques of Chinese Painting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P18中國節令 (8 values)</td>
</tr>
</tbody>
</table>

## Conceptual structures for the Chinese art concepts covered in AAT - Four Patterns

1. The values listed in a unit of the NPM are completely covered by the corresponding AAT category.
2. The values listed in a unit in NPM are not completely covered by that AAT category.
3. The values in a unit in NPM are across in various places in AAT.
4. No specific category and equivalent concept in AAT for the Chinese art concepts.
The **Concept** Issues

- **Chinese-Specific Culture**
  - Create a Whole Set of Terms (Chinese Scripts)
  - **Re-Group Terms (Chinese Bronze Vessels)**
  - Term Disambiguation (Chinese Festivals)
    - Lantern Festival

- **Western-Specific Culture**
  - The Loanword Principle
  - Term Disambiguation (Translated Terms)
    - Principle 1. Add Qualifiers to Chinese Terms (The same terms exist when translated to Chinese). Chinese qualifiers are added according to the priority rules below:
      - Upper contexts
      - Combination of multiple parent nodes
      - Extracted from scope note
    - Principle 2. Remove Qualifiers from Chinese Terms (Different terms exist when translated to Chinese.)
      - Chinese qualifiers are removed according to the elimination of homograph
AAT has these 19 ritual vessels...

Example: Chinese ritual bronzes (re-grouping)

Guide Term Suggestion: We could classify them into 3 groups based on their historical usages.
Need to add 19 NEW Chinese Ritual Bronzes!

**<Wine Vessels>**
- shao (ladle)
- gong
- hu
- fou
- he
- zhi
- ho

**<Food Vessels>**
- bi (spoon)
- fu
- dun
- li

**<Musical Instruments>**
- zhong (bell)
- ling
- duo
- nao
- zheng
- bo
- chun yu
- 錞
- 鈪
- 鼌
- 鈄
- 銈
- 鈫
- 鈺
- 銃
- 鈎
After completion... AAT will have 38 terms with classification

Possible Hierarchical Position for Chinese Bronze Vessels - Musical Instruments
What Are **Structural Issues** in an AAT Context?

- The way we classify, organize and arrange terms
- The AAT can be used to **guide users in enhancing their knowledge of specific topics and concepts**, and can even affect their views on and perception of these concepts.
- In terms of Chinese and English mapping, the study has noticed some definite patterns in the structural issues which arise.

Facet and hierarchical structures of AAT
The Structural Issue

There is a conflicting structural arrangement between Western and Chinese cultures.....

To begin with, the case of ceramic glazes
Western v.s. Chinese

In the context of Western cultures, people tend to classify ceramic glazes

- by composition
  alkaline glaze, blue-and-white, Bristol glaze, celadon, lead glaze
- by form
  clear glaze
- by technique
  blister glaze, crystalline glaze, matte glaze, overglaze

From a Chinese perspective, curators and research studies tend to classify ceramic glazes

- by color
  under different colors with varying compositions, forms and techniques

Six Conjoined Vases with Tea Dust Glaze
Ch’ien-lung Reign (1736-1795)
Qing (1644-1911)
明乾隆 茶葉末六聯瓶

Monk’s Cap Ewer with Ruby Red Glaze, Hsüan-te Reign (1426-1435)
Ming (1368-1644)
明宣德 宝石紅僧帽壺
The Problem Includes

• Some terms are shared by Western & Chinese cultures. Where should these terms be located within the hierarchical structure of the AAT?
• Some terms are arranged in different FACETS by Western & Chinese cultures
Ceramic Glaze by color vs. composition/origin vs. form vs. technique
AAT Applications: Linked Open Data (LOD) Supporting Digital Humanities
AAT as LOD (Linked Open Data) and its application in ASCDC

- Online portals for LOD Datasets, launched since 2018
  - ASCDC LOD Datasets (http://data.ascdc.tw/)
  - ASCDC LODLAB (http://lodlab.ascdc.tw/)

- Current results
  - Datasets: 13
  - Data records: 605,324
  - Triples: 5,270,200

- Topic types of ASCDC’s LOD datasets
  - Anthropology (Indigenous people in Taiwan)
  - Arts (Art Textbooks of Elementary and Public Schools in the Japanese Colonial Period, Archives of Chen Cheng-po’s Paintings and Document, Linked Taiwan Artists)
  - Audio-video files (Educational and Cultural Programs from Chinese Television System)
  - Biology (Taiwan fish species database, Taiwan’s Fish Otholits, Aquatic Animals in Taiwan)
  - History (Chinese Rare Books, Database for Names and Biographies, Database of Qing Official Titles, Wooden Slip Character Dictionary)
  - Religion (Tibetan Collection Audio Archive)
## Overview on the reused vocabularies in ASCDC LOD datasets

<table>
<thead>
<tr>
<th>Vocabularies</th>
<th>Biology</th>
<th>Anthropology</th>
<th>Religion</th>
<th>Arts</th>
<th>History</th>
<th>Audio-Video</th>
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</thead>
<tbody>
<tr>
<td>Darwin Core</td>
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<td>✔</td>
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<td>DC/ DCterms</td>
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Cross-dataset queries as strategy for data enrichment

HOWEVER,

- To link external resources is only one step for data enrichment, but to further reuse the data content of the linked external resources can further enlarge knowledge.
AAT as LOD Resource for Cross-dataset Queries

Dataset: The Archival fonds of Chen Cheng-po’s paintings and documents
Query: Which Western artists appear in Chen's scrapbooks? What were their nationalities and major activities?

CCP LOD dataset
Auguste Renoir’s News Scrapbook
雷諾瓦繪畫的雜誌剪貼圖片
http://data.ascdc.tw/archive/ith/ccp/CCP_09_01033_AP1_091

dc:subject

Auguste Renoir
雷諾瓦
http://data.ascdc.tw/Agent/archive/ith/ccp/006

owl:sameAs

ULAN: Auguste Renoir

AAT: French

AAT: Printmakers

gvp:agentTypeNonPreferred

AAT: Painters

gvp:nationalityPreferred
How can Linked Open Data enhance research? Data Enrichment
Example of Cross-dataset Query for Knowledge Expansion

Dataset: The Archival fonds of Chen Cheng-po’s paintings and documents
Query: Which Western artists appear in Chen’s scrapbooks? What were their nationalities and major activities?
Thanks for your attentions