CHIP Project
@ Rijksmuseum Amsterdam

Cultural Heritage Information Personalization

Eindhoven University of Technology, the Netherlands
Lora Aroyo, Paul De Bra, **Natalia Stash** & Yiwen Wang

Telematica Instituut, the Netherlands
Rogier Brussee, Lloyd Rutledge

Rijksmuseum Amsterdam, the Netherlands
Peter Gorgels
Contents

- CHIP goal
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Cultural partner: Rijksmuseum Amsterdam

Inside museum

http://www.rijksmuseum.nl

7758 artworks

131934 artworks
Personalized Art Experience

Personalized Web Site

- Interactive user modeling
- Personalization of navigation & presentation

Personalized Museum Tour

- Printed tour maps through the Rijksmuseum

Personalized Tour on a Mobile Device

- Interactive user modeling
- Route adaptation inside the Rijksmuseum
The Company of Frans Banning Cocq and Willem van Ruytenburch, known as the 'Night Watch'

Description
The Night Watch, the most famous painting in the Rijksmuseum, actually has another title: the 'Company of Frans Banning Cocq and Willem van Ruytenburch'. The picture is a militia painting: a group portrait of a division of the civic guard. Rembrandt depicted the group of milliarmen in an original way. He did not paint them in neat row or sitting at their annual banquet, rather, he recorded a moment: a group of milliarmen have just moved into action and are about to march off.
Approach

- Making museum metadata available in RDF/OWL
- Making relevant vocabularies available in RDF/OWL
- Aligning & enriching vocabularies/metadata
- Using resulting RDF/OWL graph for building a combined (virtual and physical) user model
- Using the above results for (semi)automatic generation of virtual and physical museum tours
The Semantic Web = Web with a meaning

"If HTML and the Web made all the online documents look like one huge book, RDF, schema, and inference languages will make all the data in the world look like one huge database"

Tim Berners-Lee, Weaving the Web, 1999

Information for the slide is taken from http://www.w3schools.com
Semantic Web: describing relationships

- Rembrandt is the creator of the The Night Watch.
- Rembrandt is the student of Peter Lastman.
- The Night Watch was created on unprimed canvas.
- Peter Lastman is the creator of Orestes and Pylades Disputing at the Altar.

![Semantic Web Diagram]

- Rembrandt
- The Night Watch
- Orestes and Pylades Disputing at the Altar
- Peter Lastman
- Unprimed canvas
- Student of
- Creator
- Material support
Semantic Web: describing relationships

Triples: \{Subject, Predicate, Object\}

http://www.getty.edu/vocabularies/ulan#500011051

vra:creator

http://www.chip-project.org/Rijksmuseum#artefactSK-C-5

vra:material.support

http://www.getty.edu/vocabularies/ulan#500032894

ulan:student_of

http://www.chip-project.org/Rijksmuseum#artefactSK-C-5

vra:creator

http://www.getty.edu/vocabularies/aat#300238097
Converting Museum Metadata in RDF/OWL

- Rijksmuseum data:
  - ARIA database (Website-targeted)
    - 729 artworks
  - Adlib database (Curator-targeted)
    - 460204
Converting Vocabularies in RDF/OWL

- provided by E-Culture project
  (http://e-culture.multimedian.nl)
  - TGN (#425,517)
  - ULAN (#1,896,936)
  - AAT (#1,249,162)
- provided by STITCH project
  (http://www.cs.vu.nl/STITCH)
  - IconClass (# 24349)
Style: Baroque

Note: Refers to the style and period of architecture, visual art, decorative art, music, and literature of Western Europe and the Americas from about 1590 to 1750. The style is characterized by balance and wholeness, often with an emphasis on spectacle and emotional content, and a tendency toward contrasts of light against dark, mass against void, and the use of strong diagonals and curves.

Terms:
- Baroque (preferred, C,U,D,American-English-P)

Facet/Hierarchy Code: F.FL

Hierarchical Position:
- Styles and Periods Facet
  - Styles and Periods
  - <styles and periods by region>
    - <Eastern European Renaissance-Baroque styles and periods>
      -(<Eastern European Renaissance-Baroque styles>),(<Eastern European Renaissance-Baroque styles>),... Styles and Periods) [3000107026]
Artist: Rembrandt van Rijn

Gender: male

Birth and Death Places:
- Born: Leyden (South Holland, Netherlands) (inhabited place)
- Died: Amsterdam (North Holland, Netherlands) (inhabited place)

Events:
- active: 1631-1669 Amsterdam (North Holland, Netherlands) (inhabited place)

Related People or Corporate Bodies:
- influenced .... Koninck, Salomon
- .................. (Dutch painter, printmaker, and draftsman, 1609-1656) [500027532]
- parent of .... Rijn, Rumbertus van
- .................. (Dutch, subject of portraits, 1635-1636) [500069934]
- patron was .... Uylenburgh, Hendrick
- .................. (Dutch painter, art dealer, and patron, 1584 or 1589-ca. 1660) [500010860]
- spouse of .... Stoffels, Hendrickje
- .................. (Dutch, subject of portraits, 1626-1663) [500070109]
- spouse of .... Uylenburgh, Saskia van
- .................. (Dutch, subject of portraits, 1612-1642) [500043384]
- student of .... Lastman, Pieter
- .................. (Dutch painter and draftsman, 1583-1633) [500032894]
- teacher of .... Backer, Jacob Adriaensz
- .................. (Dutch painter, 1608-1651) [500031967]
- teacher of .... Bol, Ferdinand
- .................. (Dutch history and portrait painter, 1616-1680) [500013764]
- teacher of .... Dou, Gerrit
- .................. (Dutch painter and draftsman, 1613-1675) [500115513]
- teacher of .... Drost, Willem
- .................. (Dutch painter, printmaker, and draftsman, ca. 1630-after 1680) [500009474]
- teacher of .... Dullaert, Heyman
- .................. (Dutch painter and poet, 1636-1684) [500021474]
- teacher of .... Eeckhout, Gerbrand van den

Note: Rembrandt was one of the most popular artists of all time, known for his dramatic scenes and strong contrasts of light on a dark background. He painted biblical and secular history and mythology. He left about 2000 paintings, over 1000 drawings, and around 300 etchings.
ID: 7006952

Amsterdam (inhabited place)

Coordinates:
Lat: 52.21 00 N degrees minutes  Lat: 52.3500 decimal degrees
Long: 004.54 00 E degrees minutes  Long: 4.9000 decimal degrees

Note: Located on over 90 islands in the IJ arm of the IJsselmeer. Early inhabitants built dikes on both sides of the Amstel River to prevent flooding, and a dam was built between the dikes in 1270. Chartered in 1306. Became affluent in the 15th century due to trade with Baltic seaports, and was the financial center of the world by 17th century. United Dutch East India Company was founded in 1602, followed by the West India Company in 1621. Capital of the Batavian Republic under Napoleon, later of the kingdom of Holland, and became part of the French Empire in 1810. Under German occupation from 1940-1945. Center of the world's diamond trade.

Names:
Amsterdam (preferred, C,V,N,English-P,Dutch-P)
Amstel-dam (H,V,N)
Amsteldam (H,V,N)
Amstelriedamme (H,V,N)
Amstelodamum (H,O,N)
Amsteadamum (H,O,N)
Amsterdam (H,O,N)
Amstredamum (H,O,N)
Amstelredamum (H,O,N)
Amstelredense oppidum (H,O,N)

............ documented in 13th cen., meaning "dam on the Amstel [river]"

............ earliest form of the name, 13th cen.

Hierarchical Position:
- World (facet)
  - Europe (continent)
    - Netherlands (nation)
    - North Holland (province)
    - Amsterdam (inhabited place)

Place Types:
inhabited place (preferred, C) ............ there possibly was a Roman settlement in the area; modern town probably originated as a fishing village in 13th century
city (C)
capital (C) ............ nominal capital of The Netherlands, though government is located in s'-Gravenhage
### Context of: 45B31

- **4**  
  Society, Civilization, Culture

- **45**  
  Warfare; military affairs

- **45B**  
  The soldier; the soldier’s life

- **45B3**  
  Military service

- **45B31**  
  Guard duty, keeping sentry

### Children

- **45B31(+)**  
  Changing the guard

- **45B311**  
  In the guard-room, 'kortegaard'

- **45B312**  
  Challenged by the guard

- **45B313**  
  Attacking the sentry

- **45B314**  
  Sentry box

### Systematic References

- **71O37(Is. 62:6)**  
  The watchmen on the walls of Jerusalem

### Keywords - Click icons for illustrations

- Society
- Civilization
- Culture
- Occupations
- Military affairs
Aligning Vocabularies

- Manual alignment of internal ARIA Rijksmuseum vocabulary to external (Getty and IconClass):
  - 2825 mappings to 283 different AAT concepts
  - 485 mappings to 263 different ULAN concepts
  - 507 mappings to 69 different TGN concepts
  - 503 mappings to 178 different IconClass concepts

- Splitting Rijksmuseum "Location/Period" metadata and mapping them to TGN Locations and AAT Periods:
  - Amsterdam, 1625-1650
  - Second quarter of the 17th century

**Examples of mappings:**
- **Oil paint** ARIA: artefactMaterial, AAT: #300015050
- **Rembrandt** ARIA: #artists/00016943, ULAN: #500011051
- **Amsterdam** ARIA: #Place88668
- **Bible** ARIA: #encyclopedia/00046971, IconClass: #7
- **Altarpieces** ARIA: #encyclopedia/00048862, IconClass: #11Q714113
- **Altar with altar-piece** IconClass: #11Q714113

**Dates and Locations:**
- **Amsterdam, 1625-1650** RM: #Atlas157849
- **Amsterdam** TGN: #1092823
- **Second quarter of the 17th century** AAT: stylePeriod
Aligning Vocabularies

- Manual alignment of internal AdLib Rijksmuseum vocabulary to external (Getty):
  - 534 different AAT concepts
  - 3846 different ULAN concepts
Enriching Rijksmuseum Vocabulary

- Adding and mapping AAT Style metadata to artists Rijksmuseum collection

**Van Gogh** ULAN: #500115588

*hasStyle*

- **Realist** AAT: #300172861
- **Impressionist** AAT: #300021503
- **Expressionist** AAT: #300021502
militia

self-portrait

style: Baroque

place: Amsterdam, 1625 to 1650

teacher of: Ferdinand Bol

teacher of: Nicolaes Maes

teacher of: Gerrit Dou
RDF/OWL Graph for Building User Model

- Asking users to rate any Rijksmuseum artwork:
  - first 20 pre-selected by museum curators
  - rest random
- Possibility to rate semantic properties of artworks
You Rate - We Recommend

North Holland

part of

Amsterdam

creationSite

creationDate

1642

material

Oil paint

The Night Watch

creator

Rembrandt

studentOf

Pieter Lastman

teacherOf

Ferdinand Bol

specific term

Portraiture

subject

Militia

subject

Baroque

style

TU/e technische universiteit eindhoven

RIJKSMUSEUM amsterdam

vrije Universiteit amsterdam

Telematica Institute
CHIP User Model - Core classes and properties

External classes and properties from FOAF

foaf:Person

foaf:Person

foaf:OnlineAccount

N-ary relation for Rate

chip:Rate_Value

chip:Rate_Relation

chip:Create_Tour

chip:has_Rated

chip:has_Created

chip:has_Rated

Objects from the enriched museum collection, refers to Fig.1 Metadata vocabularies

vra:Work

ulan:Person

tgn:Place

aat:Style

ic:Concept

Internal classes and properties in CHIP

subclass of

chip:User

Object
Approaches to Solving Cold Start Problem

- **Input From**
  - FOAF profile
  - External tagging or recommendation systems profiles, e.g.
    - flickr.com
    - del.icio.us
    - amazon.com
    - iCity (http://icity.di.unito.it/dsa)
Importing Tags from iCity

ICITY tags of the user fede

- photography
  Exact match from CHIP:
  - Photographs
  - Photography

Related artworks/concepts from CHIP:
  Jerusalem, étude et reproduction photographique des monuments de la Ville Sainte

- Photographic techniques
- Photography as inspiration
- Photography books

Giovanni
Related artworks/concepts from CHIP:
- Tiepolo, Giovanni Battista
- Piranesi, Giovanni Battista

- 1400
- repairing
Using RDF/OWL Museum Data & User Model for Generation of Museum Tours

- Automatically generated tours:
  - “Favorites” tour
  - Positively rated artworks
  - “Recommended artworks” tour
    - 20 top recommended artworks

- Creating tours manually:
  - Adding artworks and topics to tours
  - Searching for semantically related information (via E-Culture API)
    - related artists (students or teachers of an artist)
    - artworks created in the same style as artist’s style
    - etc..
CHIP Demonstrators
Future Work

- Improving existing content-based recommendations algorithm
- Social aspects based on FOAF profile
- Adapting the tour sequence on the fly
- Mobile Guide on iPod Touch
Links

- **www.chip-project.org**
  - CHIP demonstration tutorial
  - PDA tour presentation

- **www.chip-project.org/demo**