CHIP Project
@ Rijksmuseum Amsterdam

Cultural Heritage Information Personalization

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Contents

- CHIP goal
- Approach to providing personalized access
- CHIP Architecture
- CHIP demonstrators
- Future Work and Links

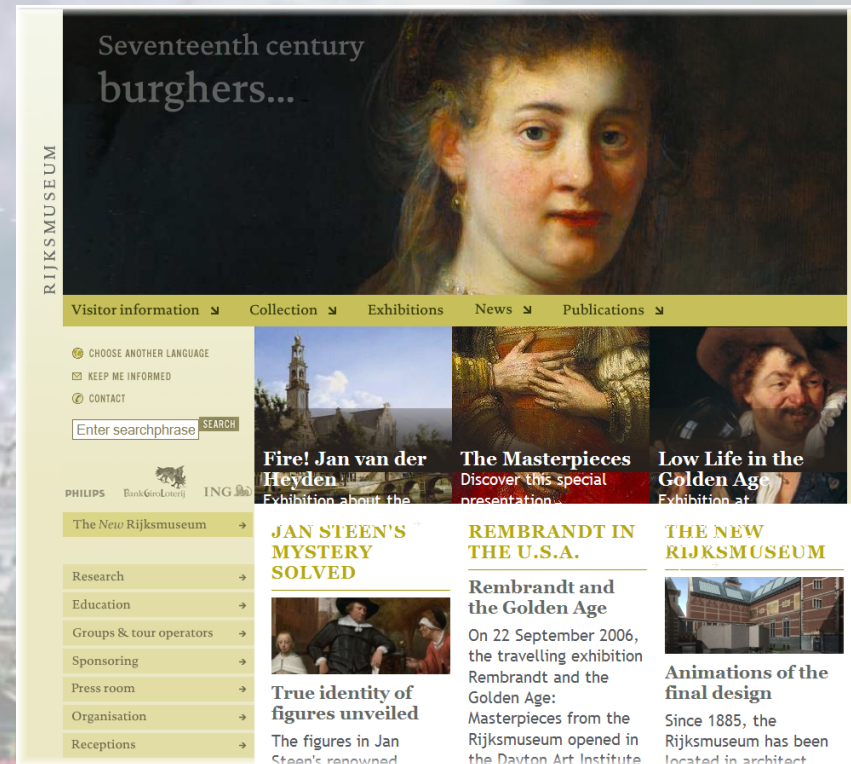# Cultural partner:
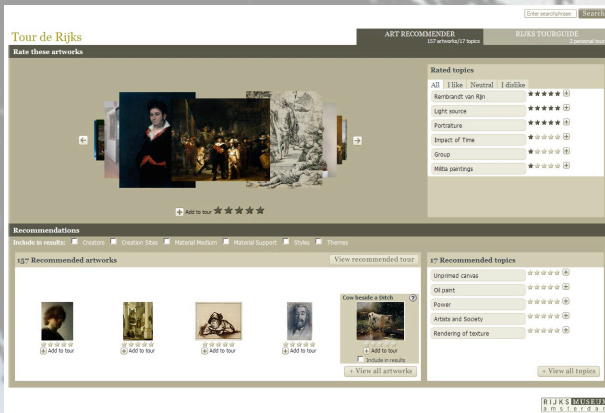# Rijksmuseum Amsterdam

Inside museum

Online
http://www.rijksmuseum.nl

7758 artworks

131934 artworks

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Personalized Art Experience

Personalized Web Site

Personalized Museum Tour

Personalized Tour on a Mobile Device

- •Interactive user modeling
- •Personalization of navigation & presentation
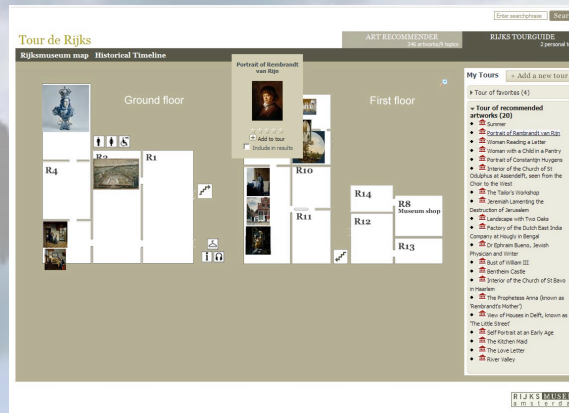
- •Printed tour maps through the Rijksmuseum

- •Interactive user modeling
- •Route adaptation inside the Rijksmuseum

Artwork Description

The Company of Frans Banning Cocq and Willem van Ruytenburch, known as the 'Night Watch'

Creator	Rembrandt van Rijn ★★★★★ ⊕
Creation site	Amsterdam ★★★★★ ⊕
Year of creation	1642
Material Medium	Oil paint ★★★★★ ⊕
Material Support	Unprimed canvas ★★★★★ ⊕
Style	Baroque ★★★★★ ⊕
Dimensions	363 x 437 cm
Exposition place	PH-012
Themes	Group ★★★★★ ⊕
	Group portraits ★★★★★ ⊕
	Militia paintings ★★★★★ ⊕
	Artists and Society ★★★★★ ⊕
	Power ★★★★★ ⊕
	Impact of Time ★★★★★ ⊕
	Annemarie Vels Heijn ★★★★★ ⊕
	The Glory of the Golden Age ★★★★★ ⊕
	Rijksmuseum collection ★★★★★ ⊕
	Composition ★★★★★ ⊕

Rate it ★★★★★ ⊕ Add to tour ☐ Include in results

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 militiamen 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 militiamen have just moved into action and are about to march off.

View related artworks

Show namespace prefix

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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
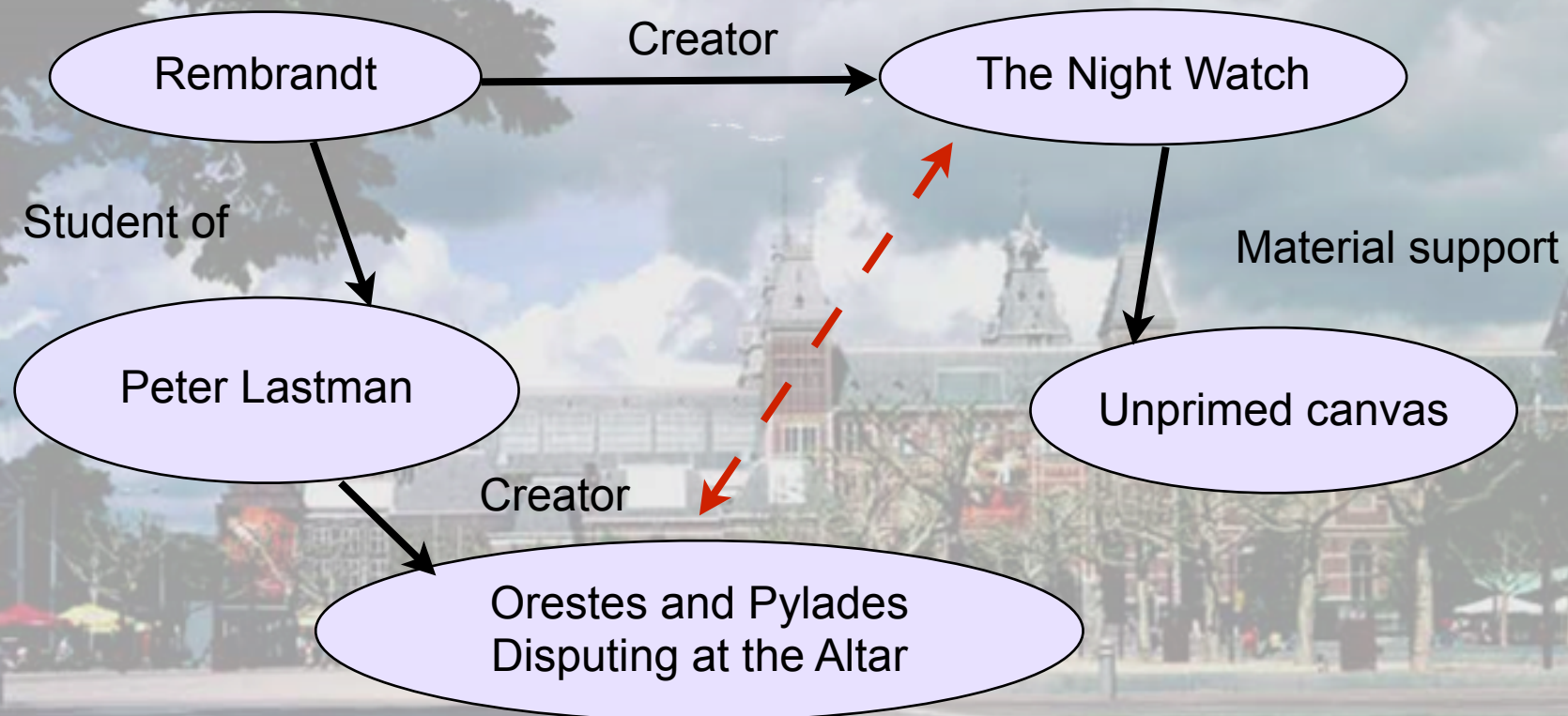
The Semantic Web = Web with a meaning

"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

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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: describing relationships

Triples: {Subject, Predicate, Object}

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

vra:creator

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

ulan:student_of

vra:material.support

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

http://www.getty.edu/vocabularies/aat#300238097

vra:creator

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

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Converting Museum Metadata in RDF/OWL

- Rijksmuseum data:
  - ARIA database (Website-targeted)
    - 729 artworks

  - Adlib database (Curator-targeted)
    - 460204

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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)

Research

Art & Architecture Thesaurus® Online
Search Results

Style: Baroque

lick the 🔷 icon to view the hierarchy.

0: 300021147   **Record Type:** concep

🔷 **Baroque** (<Renaissance-Baroque styles and periods>, <European styles and periods>, ... Styles and Periods)

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

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

acet/Hierarchy Code: F.FL

ierarchical Position:

🔷   Styles and Periods Facet
🔷   .... Styles and Periods
🔷   .... <styles and periods by region>
🔷   .... European
🔷   .... <European styles and periods>
🔷   .... <Renaissance-Baroque styles and periods>
🔷   .... Baroque

elated concepts:
   related to .... **Rococo**
      .... (<Renaissance-Baroque styles and periods>, <European styles and periods>, ... Styles and Periods) [300021155]

☐ 🔷 **<Eastern European Renaissance-Baroque styles>**
      (<Renaissance-Baroque regional styles>, <Renaissance-Baroque styles>, ... Styles and Periods) [300107026]

Union List of Artis
Full Record Displa

Artist: Rembrandt van Rijn

🔍 New Search   ◂Previous Page

Click the 🔗 icon to view the hierarchy.

ID: 500011051

🔗 **Rembrandt van Rijn** (Dutch painter, drafts

Note: Rembrandt was one of the most popular a
scenes and strong contrasts of light on a dark
biblical and secular history and mythology. He
paintings, over 1000 drawings, and around 30(

Names:

Rembrandt van Rijn (preferred, display, V)
Rijn, Rembrandt van (V)
Rembrandt Harmensz. van Rijn (V)
Rembrandt Harmensz van Rijn (V)
Rijn, Rembrandt Harmensz. van (V)
Van Rijn, Rembrandt (V)
Rembrandt (V)

Rembrandt van Rhyn (V)
Rembrandt van Ryn (V)
Rembrandt van Rhijn (V)
Rembrandt Harmensz. van Rhyn (V)
Rembrandt Harmensz. van Rhijn (V)
Rembrandt Hermansz van Rijn (V)
Rembrandt Harmenszoon van Rijn (V)
Rembrandt Hermanszoon van Rijn (V)
Rembrandt Harmensz Van Rijn (V)

Roles:
   artist (**preferred**)
   draftsman
   printmaker
   etcher
   painter
   teacher

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 .... Uylenburch, 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

Click the ⬟ icon to view the hierarchy.

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

Amsteldam (H,V,N)
Amstelledamme (H,V,N) .... earliest form of the name, 13th cen.
Amstelodamum (H,O,N)
Amsteadamum (H,O,N)
Amsterodamum (H,O,N)
Amstelredamum (H,O,N)
Amstelredamense oppidum (H,O,N)

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

Left sidebar

Research Home ▶ Conducting

Getty Thes
Search Re

🔍 New Search   ◀ Previou

Find Name: **amsterdam**
Place Type:
Nation:

View Selected Records

Click the ⬟ icon to view th
Check boxes to view multi

1. ☐ ⬟ **Amsterdam**
(World, Africa

2. ☐ ⬟ **Amsterdam**
(World, Euro

3. ☐ ⬟ **Amsterdam**
(World, North

4. ☐ ⬟ **Amsterdam**
(World, North

5. ☐ ⬟ **Amsterdam**
(World, North

6. ☐ ⬟ **Amsterdam** .... (inhabited place)
(World, North and Central America, United States, Montana, Gallatin county) [2061000]

iconclass Libertas edition

Keyword: guard | Look up

List of Keywords:

📄 guard   14 hits also see: attendant, body-guard, gaoler, guarding

📄 guard-room

📄 Guardia

📄 guardian

iconclass Libertas edition

Keyword: | Look up

©KNAV

iconclass Libertas edition

Notation: | Go To   Keyword: | Look up

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(+)	KEY
📄	45B311	changing the guard
📄	45B312	in the guard-room, 'kortegaard'
📄	45B313	challenged by the guard
📄	45B314	attacking the sentry
📄	45B315	sentry box

Systematic References

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

Search for illustrated examples of notation **45B31** in:
- Bildindex - Foto Marburg
- Mnemosyne Image Atlas
- KB Illuminated Manuscripts
- RKD Den Haag
- IMAGO OPAC Sebina

Quick Links to Main Categories:
0 1 2 3 4 5 6 7 8 9

Keywords - Click icons for illustrations

society   KB 🏛 ART

civilization   KB 🏛 ART

culture   KB 🏛 ART

occupations   KB 🏛 ART

military affairs   KB 🏛 ART

ion the ma
wed by th

gate of S
bedcham
guards
Homerica

Aligning Vocabularies

○ Manual alignment of internal ARIA Rijksmuseum vocabulary to external (Getty and IconClass):

- 2825 m
- 485 ma
- 507 ma
- 503 ma
  concept

○ Splitting R

Oil paint ARIA: artefactMaterial

Rembrandt ARIA: #artists/00016943

Amsterdam ARIA: #Place88668

Bible ARIA: #encyclopedia/00046971

   Bible IconClass: #7

Altarpieces ARIA: #encyclopedia/00048862

   Altar with altar-piece IconClass: #11Q714113

Amsterdam, 1625-1650 RM: #Atlas157849

   Amsterdam TGN: #1092823

   Second quarter of the 17th century AAT: stylePeriod

Aligning Vocabularies

o Manual alignment of internal AdLib Rijksmuseum vocabulary to external (Getty):

- 534 different AAT concepts
- 3846 different ULAN concepts

Enriching Rijksmuseum Vocabulary

o Adding and mapping AAT Style metadata
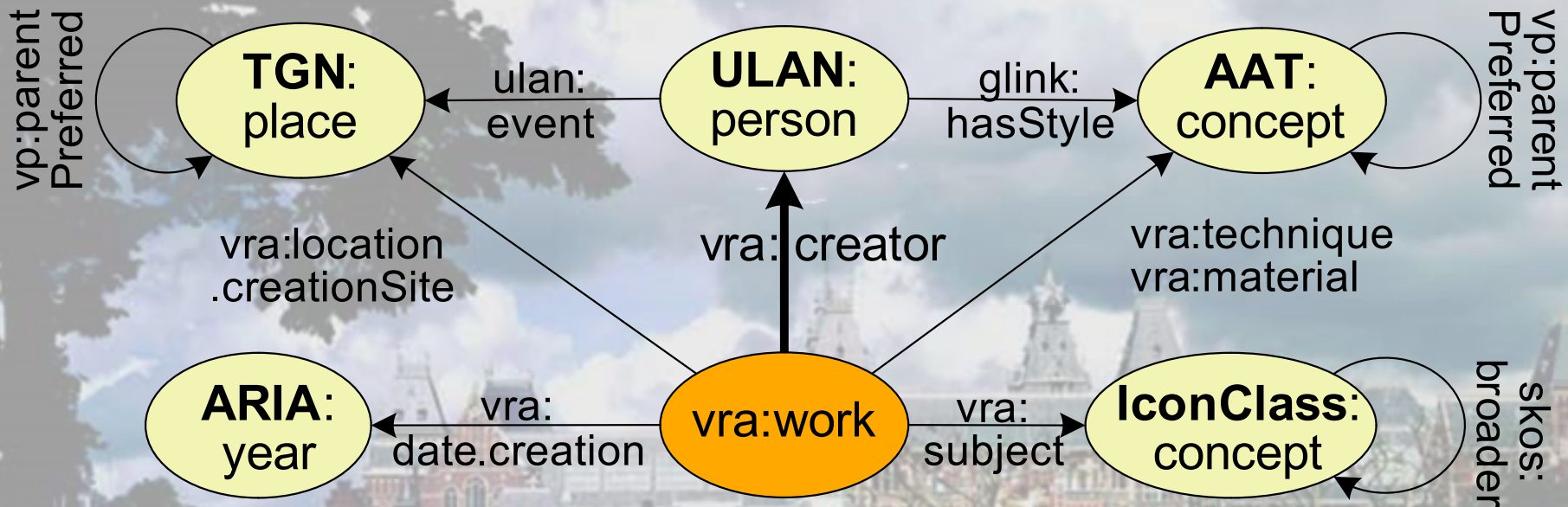to artists Rijksmuseum collection

> **Van Gogh** ULAN: #500115588
> *hasStyle*
> > **Realist** AAT: #300172861
> > **Impressionist** AAT: #300021503
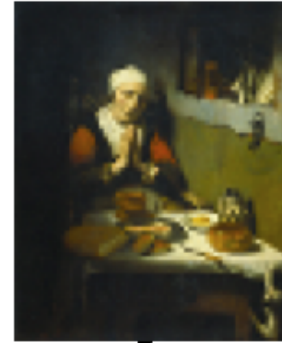> > **Expressionist** AAT: #300021502

Semantically Enriched Data

militia

teacher of: Ferdinand Bol

teacher of: Nicolaes Maes

self-portrait

teacher of: Gerrit Dou

style: Baroque

place:
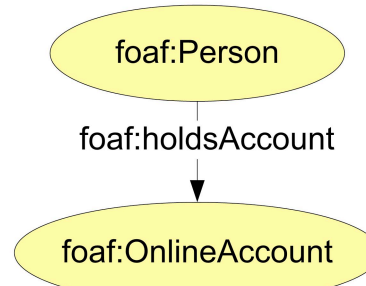Amsterdam,
1625 to 1650

RDF/OWL Graph for Building User Model

o **Asking users to rate any Rijksmuseum artwork:**
  - first 20 pre-selected by museum curators
  - rest random

o **Possibility to rate semantic properties of artworks**

CHIP User Model - Core classes and properties

External classes and properties from FOAF

foaf:Person

foaf:holdsAccount

foaf:OnlineAccount

Internal classes and properties in CHIP

subclass of

chip:User

chip:has_Rated   chip:has_Created

N-ary relation for Rate

chip:Rate_Value   chip: rated_Value   chip:Rate_Relation   chip:Create_Tour

chip:rated_Object   chip:added_Object   chip:excluded_Object
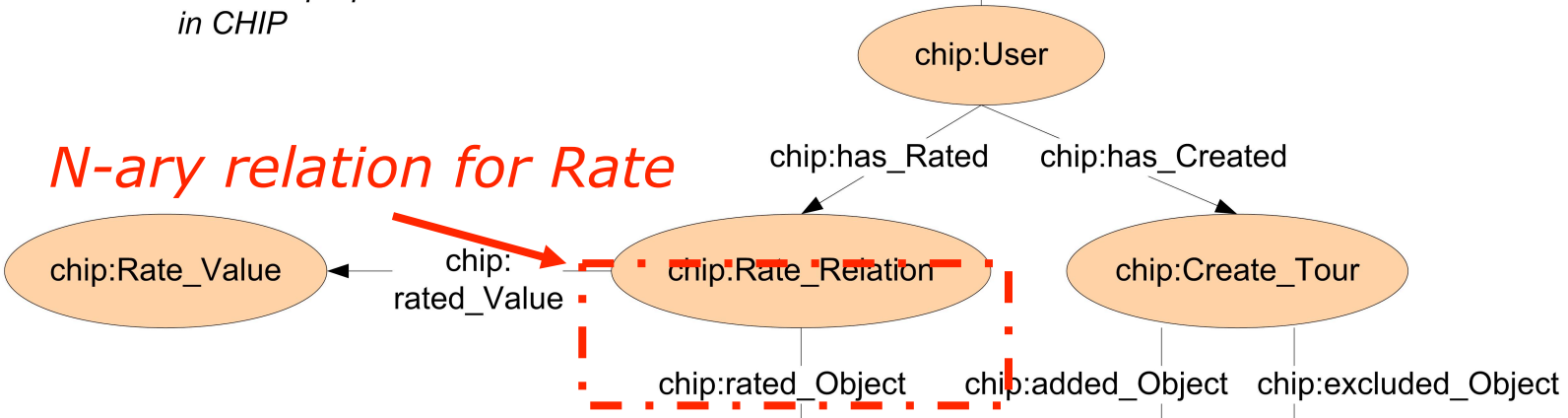
Objects from the enriched museum collection, refers to Fig.1 Metadata vocabularies

vra:Work   ulan:Person   tgn:Place   aat:Style   ic:Concept

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
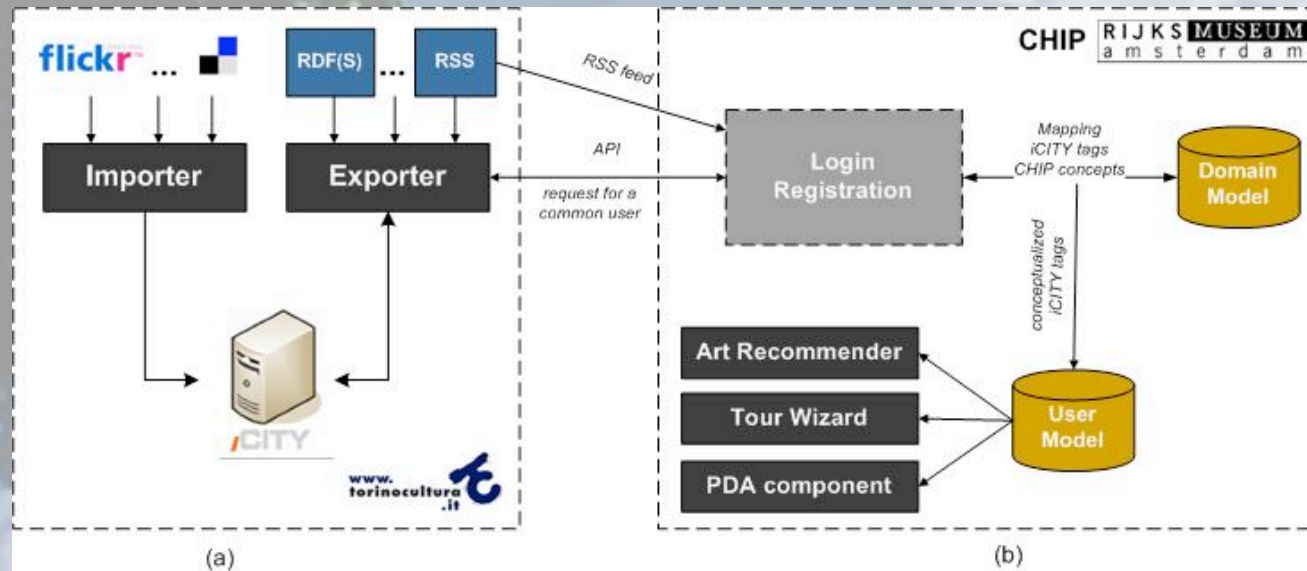
ICITY tags of the user *fede*

- **photography**
  Exact match from CHIP:
  X ☆☆☆☆☆ ✚ Photographs
  X ☆☆☆☆☆ ✚ Photography

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

  X ☆☆☆☆☆

  X ☆☆☆☆☆ ✚ Photographic techniques
  X ☆☆☆☆☆ ✚ Photography as inspiration
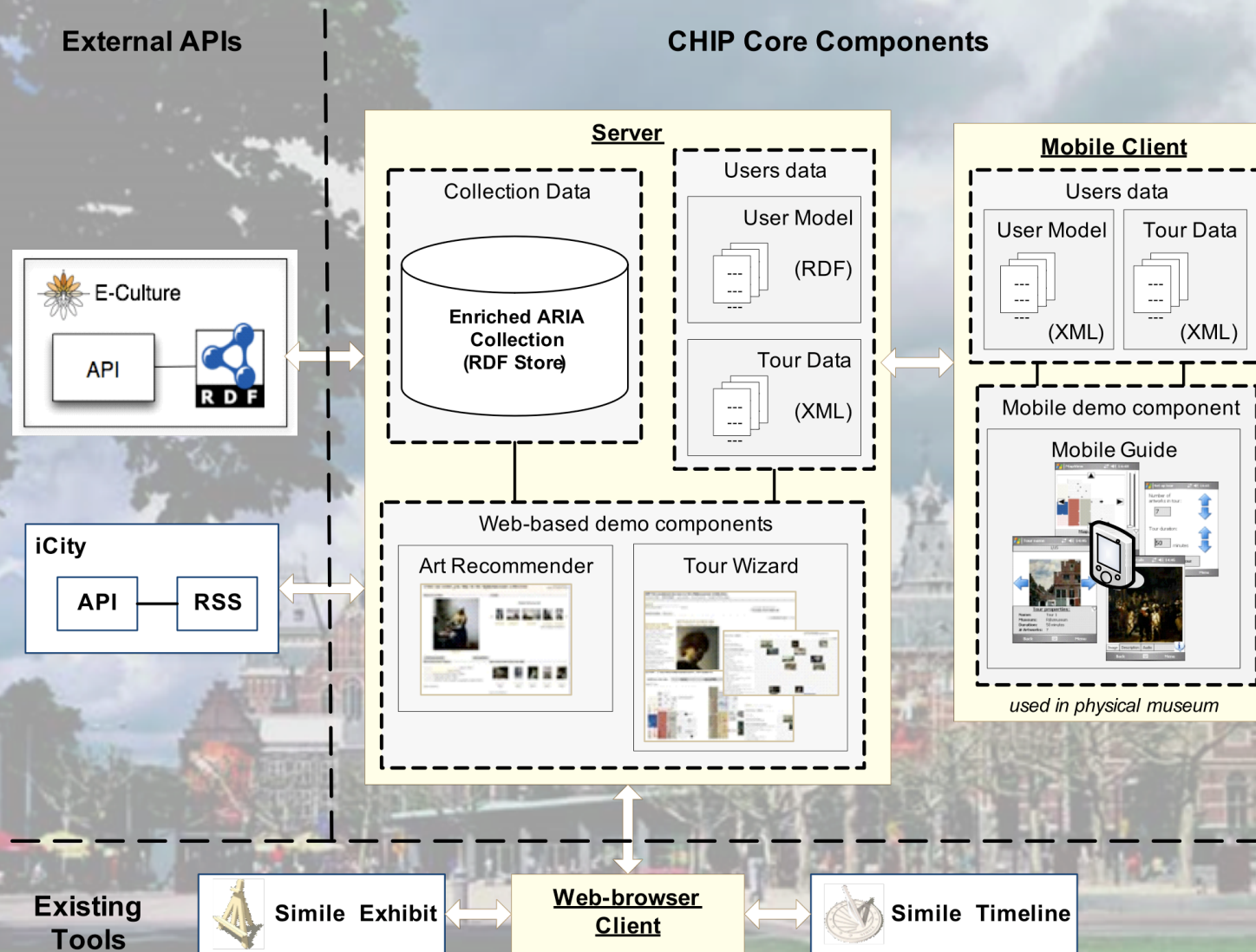 X ☆☆☆☆☆ ✚ Photography books
- **Giovanni**
  Related artworks/concepts from CHIP:
  X ☆☆☆☆☆ ✚ Tiepolo, Giovanni Battista
  X ☆☆☆☆☆ ✚ Piranesi, Giovanni Battista
- **1400**
- **repairing**

Continue...

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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 Architecture

External APIs

CHIP Core Components

Server

Collection Data

Enriched ARIA Collection (RDF Store)

Users data

User Model

(RDF)

Tour Data

(XML)

Mobile Client

Users data

User Model

(XML)

Tour Data

(XML)

Mobile demo component

Mobile Guide

used in physical museum

E-Culture

API

RDF

iCity

API — RSS

Web-based demo components

Art Recommender

Tour Wizard

Existing Tools

Simile Exhibit

Web-browser Client

Simile Timeline

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CHIP Demonstrators

Future Work

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

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Links

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

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