

**SIXTH FRAMEWORK PROGRAMME:
SCIENTIFIC SUPPORT TO POLICIES (SSP)**

Area 3.6 "the protection of cultural heritage and associated conservation strategies"



**SPECIFIC TARGETED RESEARCH PROJECT
COINS**

Deliverable D4: Domain Ontology

Project acronym: **COINS**
Project full title: **Combat On-line Illegal Numismatic Sales**

Proposal/Contract no.: FP6-SSP5-044450
Start date of project: 01/02/2007
Date of delivery: 14/09/2008
Status: **PUBLIC**

Document description

This document describes the Domain Ontology, i.e. the ontology developed within the COINS project to organize information about coins collections.

Responsible partner/author: PIN/Achille Felicetti, Andrea D'Andrea

Executive summary

The present report describes the domain ontology defined by the COINS for the numismatic domain. Such ontology is a subset of CIDOC CRM, the ISO standard for managing cultural information.

The ontology is fully described in the Appendix.

Table of contents

Executive summary	2
1. Introduction.....	4
2. CIDOC-CRM.....	4
3. Defining the domain ontology for numismatics	4
4. The domain ontology.....	5
Appendix. The Domain Ontology.....	6

1. Introduction

One of the pillars of the COINS project concerns the standardization of the data organization. The task of defining standards for the digital management of numismatic collection is the main goal of WP2. This activity consists of three separate, but converging, tasks: the definition of the domain ontology, the mapping of existing or legacy data structures to the domain ontology and the creation of a multilingual thesaurus.

The present report concerns the first one of the above tasks, the definition of a domain ontology. However, as the three tasks are tightly related to each other, some parts of it will be in common with the corresponding reports about the other two. These common parts are intentionally repeated in each report for the sake of self-consistency, but may be obviously skipped if the three reports are consulted together.

All the above-mentioned tasks have been completed with regard to the project needs. It is however clear that if new organizations would join the COINS system, the products may require adaptation. Nevertheless, the work done here paves the way for such potential new additions, demonstrating that the proposed solution is general enough to adapt to different circumstances.

2. CIDOC-CRM

According to its creators, “The CIDOC¹ Conceptual Reference Model (CRM) provides definitions and a formal structure for describing the implicit and explicit concepts and relationships used in cultural heritage documentation.

The CIDOC CRM is intended to promote a shared understanding of cultural heritage information by providing a common and extensible semantic framework that any cultural heritage information can be mapped to. It is intended to be a common language for domain experts and implementers to formulate requirements for information systems and to serve as a guide for good practice of conceptual modelling. In this way, it can provide the "semantic glue" needed to mediate between different sources of cultural heritage information, such as that published by museums, libraries and archives. The CIDOC CRM is the culmination of over 10 years work by the CIDOC Documentation Standards Working Group and CIDOC CRM SIG, which are working groups of CIDOC. Since 9/12/2006 it is official standard ISO 21127:2006.”

CIDOC CRM provides in fact an extensible ontology for concepts and information in cultural heritage and museum documentation, and as the acknowledged international standard (ISO 21127:2006) it provides the most suitable framework for the controlled exchange of cultural heritage information.

CIDOC CRM was selected by COINS as the core ontology within which to define a subset of concepts applicable to numismatics (Tasks 2.1 – 2.5) and to which any other numismatic data structure will be referred via a mapping (Tasks 2.3 – 2.7).

3. Defining the domain ontology for numismatics

The definition of the domain ontology has been developed following an iterative approach, consisting of the following steps:

- i. detailed examination of the data structures used by partners with the interested party, i.e. the partner currently using the relevant data structure;

¹ CIDOC is the acronym of the Committee for Documentation of ICOM, the international Committee for Museums.

- ii. preliminary definition of the basic elements and concepts present in partners' data structures;
- iii. verification of the intended meaning with the relevant partners, to assess the initial ontology design;
- iv. formulation of the domain ontology and, contextually, of the mapping

It resulted that since CIDOC-CRM is an event-centric model, it is necessary in any case to explicit all the events (e.g. creation, acquisition, destruction, etc.) implicit in the data structure in order to organize all the concepts of a domain. As far as coins are concerned, three different activities have been identified, corresponding to three events: the coinage; the cataloguing and the discovery (of the coin, e.g. in an archaeological excavation).

The first event deals with the action of the material production of the coin. It is an action occurred in the past and gathers all concepts concerning the actors responsible of the production (Mint, Maker, Maker-role, Maker-state, Maker-qualifier) and some features of the coin as the technique and the material (not modified in the course of the time).

The cataloguing (an action occurred in the present, or recent past) is the core of the recording process. It is possible to have different registration systems linked to various scholar studies or to numismatic traditions. Cataloguing gathers all the information pertaining to the series, collections, name of the coins and to the registration of physical features as weight, dimension and thickness. Besides, all the data concerning the museum arrangement or collocation are recorded. Another concept linked to cataloguing is the attribute-identifier: it deals with the catalogue number (or numbers) assigned by museum curators to the coin. Connected with cataloguing there may be also a modification event: when the first catalogue number assigned to the coin is modified, it is necessary to record such a variation. Other related concepts include images, their catalogue number, dimension and format.

The last event is the coin discovery, or the acquisition (i.e. how the coin got into the museum collection): from excavation (discovery), donation or purchase (acquisition).

In order to follow the CIDOC-CRM schema and to have CIDOC-CRM compliant records, for each concept a specific path ("statement") has been identified. To keep a total compatibility with the CIDOC-CRM schema, no new classes or properties were added to the original model CIDOC-CRM.

4. The domain ontology

The Appendix describes in detail the numismatic domain ontology.

Appendix. The Domain Ontology

	EVENT	COINAGE					
	CONCEPT	Coinage	Coin denomination	Material	Technique	Production date_early	production date_late
Statement 1	Class	E12.Production	E12.Production	E12.Production	E12.Production	E12.Production	E12.Production
	Property	P2F.has_type	P108.has_produced	P108.has_produced	P32F.used_general_technique	P116F.starts	P116F.starts
Statement 2	Class	E55.Type (<i>coinage</i>)	E22.Man_made_Object (<i>coin</i>)	E22.Man_made_Object (<i>coin</i>)	E55.Type (<i>technique</i>)	E2.Temporal_Entity	E2.Temporal_Entity
	Property		P1F.is_identified_by	P45F.consists_of		P4F.has_time-span	P4F.has_time-span
Statement 3	Class		E41.Appellation (<i>denomination</i>)	E57.Material (<i>material</i>)		E52.Time_Span (<i>date_early</i>)	E52.Time_Span (<i>date_late</i>)
	EVENT	COINAGE					
	CONCEPT	Maker	Maker_place	Maker_state	Maker_role	Maker_qualifier	
Statement 1	Class	E12.Production	E12.Production	E12.Production	E12.Production	E12.Production	
	Property	P14F.carried_out_by	P14F.carried_out_by	P14F.carried_out_by	P11F.had_participant	P11F.had_participant	
Statement 2	Class	E40.Legal_Body (<i>maker</i>)	E40.Legal_Body (<i>maker</i>)	E40.Legal_Body (<i>maker</i>)	E39.Actor	E39.Actor	
	Property	P131F.is_identified_by	P74F.has_current_or_former_residence	P107F.has_current_or_former_member	P131F.is_identified_by	P14.1.in_the_role_of	
Statement 3	Class	E82.Actor_Appellation (<i>maker</i>)	E53.Place	E39.Actor	E82.Actor_Appellation (<i>maker_role</i>)	E55.Type (<i>maker_qualifier</i>)	
	Property		P87F.is_identified_by	P131F.is_identified_by			
Statement 4	Class		E48.Place_Name (<i>maker_place</i>)	E82.Actor_Appellation (<i>maker_state</i>)			

	EVENT	CATALOGUING					
	CONCEPT	Cataloguing registration	Cataloguing date	Catalogue Number	Object number	Collection	Dimension
Statement 1	Class	E13.Attribute_Assignment	E13.Attribute_Assignment	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E13.Attribute_Assignment (cataloguing)	E22.Man_made_Object (coin)
	Property	P14F.carried_out_by	P14F.carried_out_by	P36B.was_registered_by	P36B.was_registered_by	P140F.assigned_attribute_to	P43F.has_dimension
Statement 2	Class	E39.Actor	E39.Actor	E15.Identifier_Assignment	E15.Identifier_Assignment	E22.Man_made_Object (coin)	E54.Dimension (dimension)
	Property	P14B.performed	P14B.performed	P37F.assigned	P37F.assigned	P46B.forms_part_of	P90F.has_value
Statement 3	Class	E7.Activity	E7.Activity	E42.Object_Identifier (inventory)	E42.Object_Identifier (object_number)	E78.Collection (collection)	E60.Number (dimension_value)
	Property	P2F.has_type	P2F.has_type	P70B.is_documented_in			P91F.has_unit
Statement 4	Class	E55.Type (cataloguing)	E55.Type (cataloguing)	E31.Document (Catalogue Number)			E58.Measurement_Unit (dimension_unit)
	Property	P67F.refers_to	P4F.has_time-span				
Statement 5	Class	E31.Document (number_of_digital_form)	E52.Time-Span				

	EVENT	CATALOGUING					
	CONCEPT	Weight	Thickness	Diameter max - min	Location	Inscription description	Inscription position
Statement 1	Class	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E25.Man_Made_Feature (coin)	E25.Man_Made_Feature (coin)
	Property	P43F.has_dimension	P43F.has_dimension	P43F.has_dimension	P49F.has_former_or_current_keeper	P128F.carries	P128F.carries
Statement 2	Class	E54.Dimension (weight)	E54.Dimension (thickness)	E54.Dimension (diameter)	E40.Legal_Body (museum)	E73.Information_Object	E73.Information_Object
	Property	P90F.has_value	P90F.has_value	P90F.has_value	P131F.is_identified_by	P106F.is_composed_of	P106F.is_composed_of
Statement 3	Class	E60.Number	E60.Number	E60.Number	E82.Actor_Appellation	E36.Visual_Item	E36.Visual_Item
	Property	P91F.has_unit	P91F.has_unit	P91F.has_unit	P74F.has_current_or_former_residence	P138F.represents	P2F.has_type
Statement 4	Class	E58.Measurement_Unit (gr)	E58.Measurement_Unit (mm)	E58.Measurement_Unit (mm)	E53.Place (Place)	E1.Entity	E55.Type (inscription_position)
	Property					P3F.has_note	
Statement 5	Class					E62.String (inscription_description)	

	EVENT	CATALOGUING					
	CONCEPT	Museum location	Image reference location	Type and dimension of images	Conservation state	Classification	
Statement 1	Class	E22.Man_made_Object (coin)	E25.Man_Made_Feature (coin)	E25.Man_Made_Feature (coin)	E25.Man_Made_Feature (coin)	E22.Man_made_Object (coin)	
	Property	P59B.is_located_in_or_within	P70B.is_documented_in	P70B.is_documented_in	P44F.has_condition	P41B.was_classified_by	
Statement 2	Class	E53.Place	E31.Document (image_reference)	E31.Document (image_reference)	E3.Condition_state (conservation state)	E17.Type_Assignment	
	Property	P87F.is_identified_by	P2F.has_type	P43F.has_dimension		P42F.assigned	
Statement 3	Class	E46.Section_Definition	E55.Type	E54.Dimension (dimension_value)		E55.Type (series)	
	Property	P58B.defines_section		P2F.has_type		P127B.has_narrower_term	
Statement 4	Class	E22.Man_made_Object (location_type)		E55.Type (dimension)		E55.Type (sub-series)	
	Property	P59B.is_located_in_or_within		P2F.has_type		P127B.has_narrower_term	
Statement 5	Class	E53.Place (location)		E55.Type (dimension_unit)		E55.Type (sub-sub series)	

	EVENT	CATALOGUING			
	CONCEPT	Acquisition Method	Transfer	Entry date	Excavation Area
Statement 1	Class	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E22.Man_made_Object (coin)	E5.Event (discovery)
	Property	P24B.changed_ownership_through	P24B.changed_ownership_through	P24B.changed_ownership_through	P7F.took_place_at
Statement 2	Class	E8.Acquisition	E8.Acquisition	E8.Acquisition	E53.Place (excavation area)
	Property	P2F.has_type	P23F.transferred_title_from	P4F.has_time-span	P87F.is_identified_by
	EVENT	CATALOGUING			
	CONCEPT	Areas	Trench	Stratigraphical Unit	Type of Site
Statement 1	Class	E5.Event (discovery)	E5.Event (discovery)	E5.Event (discovery)	
	Property	P7F.took_place_at	P7F.took_place_at	P7F.took_place_at	
Statement 2	Class	E53.Place (area)	E53.Place (area)	E53.Place (area)	E53.Place (area)
	Property	P88F.consists_of	P88F.consists_of	P88F.consists_of	P41B.was_classified_by
Statement 3	Class	E53.Place (sub area)	E53.Place (sub area)	E53.Place (sub area)	E17.Type_Assignment
	Property	P87F.is_identified_by	P88F.consists_of	P88F.consists_of	P41F.classified
Statement 4	Class	E44.Place_Appellation	E53.Place (trench/sondage)	E53.Place (trench/sondage)	E53Place
	Property		P87F.is_identified_by	P88F.consists_of	P2F.has_type
Statement 5	Class		E44.Place_Appellation	E53.Place (us)	E55.Type (settlement/cemetery/religious area/etc.)