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# Space, time and period - the Neoclassica approach

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## Abstract

Modelling temporal and spatial entities is a major challenge when datifying historical information because both categories envelope often incomplete and ambiguous information, expressed in a multitude of ways and concepts particular to a language and historiographic tradition. These challenges imbued in the nature of the historical fundamentals not only affect modelling as a practice but also the way in which linked data can be built and information can be extracted from unstructured data.

In the Neoclassica project we strive to create rich conceptual representations of Neoclassical realia as well as their relations to the life-world from which they sprung and make these representations accessible to inquiry from the historical disciplines. These representations moreover integrate multiple modi - more precisely text and visuals.

To this end we apply techniques of knowledge representation, namely a domain-specific ontology (Donig e.a. 2016) integrated with CIDOC-CRM, as well as more data-centred knowledge generation techniques - in particular Deep Learning for object segmentation in images and open information extraction from textual sources (Donig e.a. 2020).

In the paper proposed here, we will present our approach to modelling the "historical fundamentals". In particular, we will focus on our modelling of historical places that we understand in following CIDOC-CRM as periods. Moreover we will seek to systematize a range of temporal-spatial entities - either defined or implied - that we have encountered in our project and illustrate how they can be expressed in our model.

The Neoclassica-ontology was conceived as a research oriented representation of (foremost) artefacts and interior spaces. While for this domain a considerable number of printed and digital thesauri and taxonomies exist (e.g. Verdier & Magnien 2001; Böth 2005 or the Getty Vocabularies), we found that none of them was rich and specific enough for our requirements; nor would they be cross-culturally consistent while at the same time taking the historical semantics of their concepts sufficiently into account. A major contribution by the ontology is thus in the field of modelling artefacts as well as their constructional and aesthetic features. However, as artefacts are created, modified, change proprietors, or occupy a certain place at a given time, we obviously also need to represent actors, space and time. For representing such more general concepts the ontology is integrated with CIDOC-CRM. For instance the production-event is denoted as *E12 Production* while materials and techniques involved in the process are represented by *E55 Type* enabling us to accommodate thesauri such as the AAT. Actors on the other hand are modelled as *E39 Actor* as well as its subclass *E21 Person*

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and may be linked for instance to ULAN or VIAF/GND records.

Here we will focus particularly on our modelling of historical places that we conceptualize in following CIDOC-CRM as periods.

This choice was motivated by the requirement to model entities such as the *Kingdom of Westphalia around 1800*; *south-western German artefact, beginning of the 19th century*; *provincial Louis XVI*; *Georgian, the Jacob Workshop* or even *classicist*, to name but a few.

We will illustrate the modelling approach of Neoclassica by providing both a concrete example of modelling a particular artefact and a systematization of the range of temporal-spatial entities and how they can be expressed in our model. (An example focused on illustrating our contribution to modelling the artefact realm may be found at [https://neoclassica.fim.uni-passau.de/wp-content/uploads/tablet\\_view.html](https://neoclassica.fim.uni-passau.de/wp-content/uploads/tablet_view.html))

CIDOC-CRM offers the instrument to make such modelling choices by providing in particular the *E4 Period* class comprising sets of coherent phenomena or cultural manifestations occurring in time and space. (<http://www.cidoc-crm.org/Entity/E4-Period/Version-6.2.2>) This class may have the property *P7 took place at* (witnessed) to record the actual place and a wide variety of time related properties. Additionally, it provides the inherited property (from class *E92 Spacetime Volume*) *P161 has spatial projection* (is spatial projection of), which enables a period to be used as a place identification.

This approach accommodates a broad range of concepts. While it is more or less evident for the *Kingdom of Westphalia around 1800*, it is less straightforward with regard to, for instance, *south-western Germany at the beginning of the 19th century*, or *provincial Louis XVI*, yet even more so, in our opinion, for a concept like *the Jacob Workshop*.

This atelier was created by French maître ébéniste Georges Jacob (1739-1814) and then handed down to his sons Georges Jacob Fils (-1803) and François-Honoré-Georges Jacob (1770-1841). The company changed names and relocated multiple times (Lefuel 1923; idem 1926).

An obvious way of modeling *the Jacob Workshop*, is as an actor (the creator of a series of artifacts), although this could also be implied by using just the name of George Jacob himself as a creator. (This would present a problem if the data ingested in the system come from outside sources, e.g. from structured data such as museum databases or thesauri, and/or unstructured data such as texts via natural language processing).

As a *place*, a workshop occupies a specific geographical location that might change over time (move, expand or contract, be destroyed and rebuild in another location, generally affected by events of the kind). All these transformations can be modelled using CIDOC-CRM as periods of events.

In the end this presents us with a fundamentally historical question - namely for the identity of the entity *Jacob Workshop*, which might be perceived to change in various contexts.

In respect to objectives of the call we would like to enter into an exchange with the other participants as to how such contexts are to be modeled and presented, as well as how they are to be manipulated by a computer.

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