Work in progress attempting to apprehend photography in CIDOC CRM modelling : theoretical contribution to modelling traces, information and meaning constructions

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Abstract

Integrating data in Cultural Heritage (CH) disciplines may inherited from multiple process or methodologies of digital document (DD) analysis wether the DD may contain text or images or other features associated with the document and/or the context of production of the document itself. Asserting historical authentification of informations contained or subsumed in a DD leads different disciplines to build methods that may include conceptual data modelling (see for example Bruseker & al, 2017).
In the proposed approach, a DD – here a digital photograph of a technical drawing, is apprehended as an artefact (see for instance, DOLCE developpments by Kassel & al, 2009), a concept of the technical object both a) relational - the object defined by its relationships to the environment, and b) processual - the mode of existence of the technical object is defined by the concrete modalities of its genesis (Guchet, 2017).

E38 – Image CIDOC CRM entity may be considered in a first attempt to apprehend a digital photograph, since this entity comprises distributions of form, tone and colour that may be found on surfaces such as photos (...) or directly on electronic media, but it does not solve questions arising in a "spot the difference" competition of very similar digital photographs of technical drawings of an artefact. At a higher level of CIDOC CRM entities, a digital photograph may be an instance of a E36 – Visual Item entity, with relations intended to describe E37 – Mark or E38 – Image of a photograph of an artefact (E1 – Entity) to contribute in differentiating details in photographs representing it (through p138 – represents property), in a purpose of asserting authorship of the drawing captured by the DD. Thus, E37 – Mark may be used to relate the digital photograph (is a E36 – Visual Item) with signs, signatures of symbol having semantic significance, but it does not relate to " traces " relative to a gesture imprint of the author since these features should be documented as instances of E25 Man-Made Feature.

In the field of cognitive research or info-communicational approach, heir of semiotics interdisciplinary approaches (see for exemple, Bachimont, 2019), studying photographs leads to a concept of " trace " (see for instance, Leleu-Merviel, 2013) already mentionned in conceptual data modelling in different disciplines. For exemple, in archeology, (Stoleru, 2019) identifies anthropic traces within a conceptual model limited to five Cidoc-CRM entities,

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considering both approaches of the digital document : as an aesthetic form (plastic analytical report) and as the result of a process that happened in time (technical anlalytical report). Both reports are necessary as the first one (aesthetic description) may lack of evidence in giving statments for the absence of traces. In the field of computer science, (Al Haider & al, 2011) use a notion of trace associated to the dynamic analysis of computationnal execution, where ontologies may help in in identifying the semantics of execution traces relative to events in the human-machine interface. Moreover, at the frontier of computer science and history, (Coustaty & al, 2011) propose the use of ontologies to reduce the gap between historian's and image processing analysis, associating features (identified manually or with deep learning techniques) and spatial relations, thus trying to relate pixels and semantics with
annotations of spatial regions of the digital document. For CH multimedia documents, (Sinclair & al, 2006) provide an intellectual base to create meaningful contextual networks of facts based on participation of material and immaterial items in historical events and part-whole relations, through annotation of E38 Cidoc CRM Image entity (is a E36 Visual Item), related to the historical event through P138 represents property. In a widely accepted CIDOC-CRMmodelling of the DD, (Rodriguez-Echavarria, Karina & al, 2012), proposed a Cidoc CRM extension to assert the provenance of digital document for scientific observation, modelling process involved in producing representation of historical knowledge with digital inscription on information carrier (D13 – Digital Information Carrier), which may or may not contain information, taking into account the possible absence of traces or features. But these methodologies do not attempt to define trace as a relationaland processual concept, as the litterature widely considers that everything is a trace or everything can become a trace (Leleu-Merviel, 2013).

The present work in progress investigates the possibility to use a concept of " trace " in DOLCE scheme (Gangemi, Aldo & al, 2002), with a question arising about authorship of a technical drawing perceived through a DD. Following the work of (Roland Barthes, 1980), studying photograph in the framework of a visual trace from indexed retention to drawing (or writing) leads to the identification of at least for qualifying levels (Leleu-Merviel, 2013) : the Spectrum, the Res, the Studium and the Documentum. Traces of differing authorships in a " spot the difference " competition of digital photographs of very similar technical drawings found in patents archives – here the transporter bridge build in the late nineteen century, may thus be discussed in the CIDOC-
CRM modelling process.

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