

Transdisciplinary approach to archaeological investigations in a Semantic Web perspective

Vincenzo Lombardo^{a,*}, Tugce Karatas^a, Monica Gulmini^b, Laura Guidorzi^{c,d} and Debora Angelici^e

^a *Dipartimento di Informatica, Università di Torino, corso Svizzera 185, 10149 Torino, Italy*

E-mails: vincenzo.lombardo@unito.it, tugce.karatas@unito.it

^b *Dipartimento di Chimica, Università di Torino, via Pietro Giuria 7, 10125 Torino, Italy*

E-mail: monica.gulmini@unito.it

^c *Dipartimento di Fisica, Università di Torino, via Pietro Giuria 1, 10125 Torino, Italy*

E-mail: laura.guidorzi@unito.it

^d *INFN Sezione di Torino, via Pietro Giuria 1, 10125 Torino, Italy*

E-mail: laura.guidorzi@unito.it

^e *e Freelance Conservation Scientist*

E-mail: debora.angelici@gmail.com

Editors: Mehwish Alam, FIZ Karlsruhe, Germany; Victor de Boer, Vrije Universiteit Amsterdam, Netherlands; Enrico Daga, The Open University, United Kingdom; Marieke van Erp, KNAW Humanities Cluster, Netherlands; Eero Hyvönen, University of Helsinki, Aalto University, Finland; Albert Meroño Peñuela, Vrije Universiteit Amsterdam, Netherlands; Harald Sack, FIZ Karlsruhe, Germany

Solicited reviews: Xander Wilcke, Vrije Universiteit Amsterdam, Netherlands; Alessandro Adamou, Apache Software Foundation, USA; Franco Niccolucci, PIN, Italy; One anonymous reviewer

Abstract. In recent years, the transdisciplinarity of archaeological studies has greatly increased because of the mature interactions between archaeologists and scientists from different disciplines (called “archaeometers”). A number of diverse scientific disciplines collaborate to get an objective account of the archaeological records. A large amount of digital data support the whole process, and there is a great value in keeping the coherence of information and knowledge, as contributed by each intervening discipline. During the years, a number of representation models have been developed to account for the recording of the archaeological process in data bases. Lately, some semantic models, compliant with the CRMarchaeo reference model, have been developed to account for linking the institutional forms with the formal knowledge concerning the archaeological excavations and the related findings. On the contrary, the archaeometric processes have not been addressed yet in the Semantic Web community and only an upper reference model, called CRMsci, accounts for the representation of the scientific investigations in general. This paper presents a modular computational ontology for the interlinked representation of all the facts related to the archaeological and archaeometric analyses and interpretations, also connected to the recording catalogues. The computational ontology is compliant with CIDOC-CRM reference models CRMarchaeo and CRMsci and introduces a number of novel classes and properties to merge the two worlds in a joint representation. The ontology is in use in “Beyond Archaeology”, a methodological project for the establishing of a transdisciplinary approach to archaeology and archaeometry, interlinked through a semantic model of processes and objects.

Keywords: Archaeology, CRMarchaeo model, archaeometry modeling, BeArchaeo project

* Corresponding author. E-mail: vincenzo.lombardo@unito.it.