# Twinning Classics and A.I.: Building the new generation of ontology-based lexicographical tools and resources for Humanists on the Semantic Web

Maria Papadopoulou[1,2] and Christophe Roche[1,2]

[1] University Savoie Mont-Blanc, France
[2] Liaocheng University, China
firstname.lastname@univ-smb.fr



**Abstract.** This Twin Talk is about the ongoing collaboration between an expert in Classics and an expert in Artificial Intelligence (A.I.). Our approach set out to answer two interlinked issues, ubiquitous in the study of material culture: first, pairing things to their names (designations) and, second, having access to multilingual digital resources that provide information on things and their designations. Our chosen domain of application was ancient Greek dress, an iconic feature of ancient Greek culture offering a privileged window into the Greek belief systems and societal values. Our goal was to place the Humanist/domain expert at the centre of the endeavour enabling her to build the formal domain ontology, without requiring the assistance of an ontology engineer. The role of A.I. was to provide automations that lower the cognitive load for users unfamiliar with knowledge modelling. Building the model consisted in distinguishing between concept level (i.e. the stable domain knowledge) and term level (i.e. the terms that name the concepts in different natural languages), putting these into relation (i.e. linking the terms in different languages to their denoted concepts), and providing complete and consistent definitions for concepts (in formal language) and terms (in natural language).

**Keywords:** ancient Greek dress, ontology, terminology.

## 1 Introduction

The proposed Twin Talk is about the story of an interdisciplinary collaboration between an expert in the Humanities (Classics) and an expert in digital technology (Artificial Intelligence) working together to answer two interlinked issues, ubiquitous in the study of material culture, broadly defined as “the investigation of the relationship between people and things irrespective of time and space” [1]: first, pairing things to their names (designations) and, second, having access to multilingual digital resources that provide information on things and their designations. Our chosen domain was ancient Greek dress, an iconic feature of ancient Greek culture which offers a privileged window into the Greek belief systems and societal values. The challenge was triple:

a/ deal with the complex history of terms designating ancient Greek dress, some inherited from ancient times, others coined by scholarship dating since the Renaissance [2-3].
b/ define concepts formally, yet in a way that would be intuitive to the Humanist-Classical scholar, enabling her to do the ontological modelling on her own.
c/ model domain concepts *and* terms providing definitions for both (i.e., formal definitions for concepts; natural language definitions for terms, based on the concept designated by each term).

The paper is organized in five sections: Section 1 is the Introduction. Section 2 presents the chronicle of this ongoing collaboration. Section 3 introduces the problem addressed and explicates the solution given and the reasons for choosing it. Section 4 provides record of the fruit of the collaboration. Section 5 relates the particulars of the collaboration experience. Finally, section 6 reports on the lessons learnt and suggests a number of good practices.

## 2 Teaming up: the Classical scholar and the Artificial Intelligence (A.I.) expert

Our team of two is made up of researchers at different career stages and with different academic backgrounds, coming from disciplines as disparate as Classics and A.I. It was initially formed with the aim to combine our diverse expertise in lexicography, classics and dress studies (Classicist), terminology, ontology and A.I. (digital expert) to model knowledge and terminology used to express this knowledge in the domain of ancient Greek dress. Our working hypotheses are as follows: a/ while ancient Greek garments and their names are culture-specific, ancient Greek dress concepts can be described in a context-free, formal manner that enables sharing them across different natural languages; b/ concepts are defined by a set of *essential characteristic* known to domain experts, traceable in texts, and visible through the representations of dress in sculptures, painted vases, coins, etc. (a characteristic is *essential* for an object iff, when removed from the object, the object is no more what it *is*. For example, 'without sleeves' is an essential characteristic for an exomis)

We first met at the 2013 Terminology and Ontology: Theories and Application (TOTh) workshop organized at the University of Copenhagen, where we both contributed papers [4]. This was a happy coincidence that kick-started a series of academic exchanges: the Humanist expressed the grave problem she encountered when dealing with the terminology of dress in her domain. The Digital expert promised that this was feasible and started to explain why. Soon they realized that this problem was part of a wider problem facing the whole community that worked with textile and dress terminology, which seemed unsolvable for decades: textiles and dress scholars need to standardize the language used in order to communicate knowledge about the objects of the domain, so that everybody understands the same thing.

After the launching of the Humanist's Marie Curie Fellowship at the University of Copenhagen (2015-2017), the team started working on modelling the domain of ancient Greek dress. This work was a deliverable of the Humanist's two year project, as shown in the final project report [5]. In January 2017 the Humanist joined team Condillac-LISTIC lab, at the University of Savoie, France. Condillac was founded by the Digital expert several years back [6]. It is an international and interdisciplinary team primarily of computer scientists and linguists working on Knowledge Representation. In November 2017 a new research center was opened at the Computer Department of Liaocheng University, China [7] and the Digital expert asked the Humanist to present their work and give lectures on Digital Humanities in China, so that more students and researchers in Computer Science as well as in the Arts and Humanities would become familiar with the idea of embarking on digital humanities projects individually or in teams made up of a humanist and a computer scientist. The two researchers' collaboration is ongoing in the context of both Condillac and KETRC.

## 3 Problem and solution

### 3.1 The problem of 'naming things' in the experts' own words: a terminology and knowledge modeling issue

Scholars vividly express a need, omnipresent in the study of material culture terminology, whether the research area is ancient Greek dress (cf. d, e, h, j), dress of medieval Scandinavia (cf. c), Greek material culture (cf. a), ancient Egyptian art (cf. b, k), clay pottery from different cultures (cf. f, g, i) to:

i) Determine what term goes with what object combining textual, iconographic, material sources:

a. "Only studies that combine archaeological and iconographic data with knowledge derived from texts give the opportunity to correlate a word with an object." [8]

b. "In our case, the content of the terminology pertains to two fields: objects and pictures. When saying "objects", I mean the entire material culture ... the terms we are looking for pertain, obviously not to the specimens existing in reality, but to every occurring type of objects and buildings. We have to do here with a list of designations of things." [9]

c. "Research into dress history, whether the approach is founded in history, art or archaeology, incorporates terminology, one way or another." [10]

ii) Adopt a standard common vocabulary of terms and definitions to promote research in their field:

d. "Although the standard Greek and Latin terminology employed by scholars to describe ancient clothing may not be that which was used in antiquity … it is a useful vocabulary of dress and will be used here." [13]

e. "Studies of garment-terms in historical societies tend to be hampered by a lack of understanding of the specific vocabulary of dress." [11]

f. "…it would help if we could work out a list of standard vessel shapes, clearly defined and illustrated, and a set of terms for them." [12]

g. "An intelligent discussion of pottery shapes is rendered more difficult by lack of definitive nomenclature." [13]

h. "… Arabic terms for specific veil types (words like shaal, maghmuq, and lithma) … will be used to identify certain ancient Greek veil-styles. This might not be the most satisfactory answer, but at least it is expedient: we need to adopt a common workable veil-vocabulary so that our investigation of the Greek veil can proceed without further complication or impediment." [11]

iii) Have access to diachronic multilingual resources providing information on things and their names:

i. "…that we seek standardized terms for ceramic vessels expresses what I feel to be a real need…develop multilingual vocabularies of technical terms" [14]

j. "Creating a diachronic and global costume term base…is of considerable value for textile terminology." [15]

k. The chief aim of a terminology is efficient communication among specialists when discussing matters orally or in written form, efficient organisation of data banks, and - a point of particular importance - successful communication among electronic data banks. [9]

Dress scholars have attempted to unravel the complexity of dress terminology [17-18] and produce a classification of clothing in order to meet the need for a transcultural denomination system for clothing parts, but the domain of ancient Greek dress has never been described using a stable vocabulary [19-22]. Contemporary needs for machine tractable data on the Web impel the use of software artefacts, i.e., controlled vocabularies, thesauri, ontologies, to structure domain knowledge. Yet, existing thesauri, i.e., the Getty Art and Architecture Thesaurus (AAT) [23], ontologies of the domain of dress [24], the CIDOC CRM, which provides definitions and a formal structure for describing concepts and relationships in cultural heritage documentation [25], do not cover the needs of scholars interested in ancient Greek dress, as they do not include any Greek terms, apart from *chlamys(es)*, *chiton(s)*, *peplos(es)* and *himation(s)* in AAT.

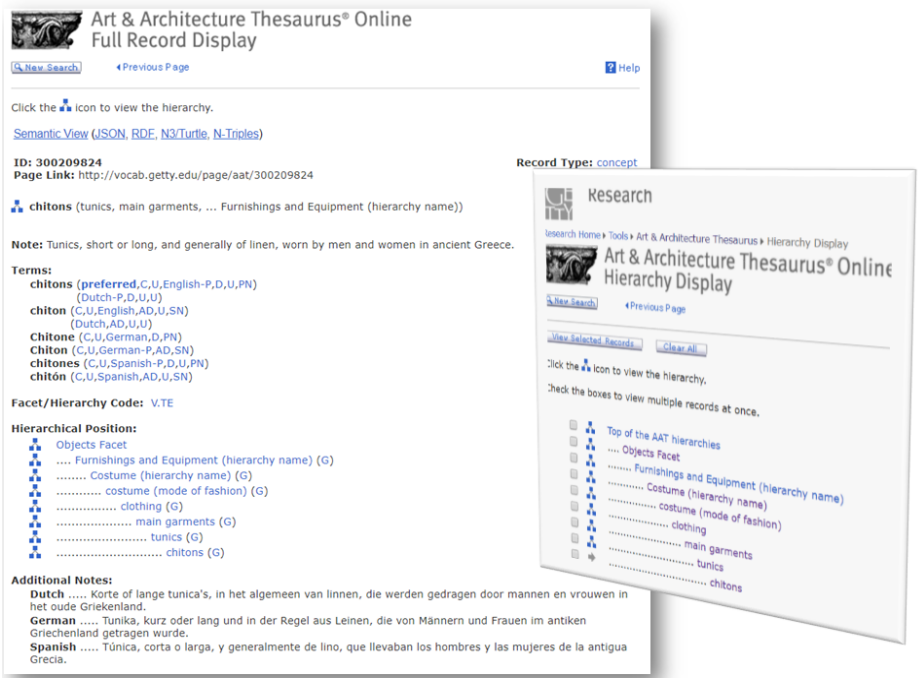

Fig. 1: Art & Architecture Thesaurus *s.v. chitons*

### 3.2 The solution: empowering the Classicist

Our aim was first, to match the names (terms) to the objects (concepts) of the domain by defining them with consistency, then, structure and publish these terminological data as shareable and reusable Linked Open Data with the help of a software platform that would build the concept system based on defining concepts as sets of essential characteristics, in compliance to ISO 108) [16]. We wished to achieve the above tasks using workflows and tools that empower classicists and humanists by matching their way of thinking and working, not the way of thinking and working of Semantic Web experts and developers. The domain of application was ancient Greek dress and its culture-specific terminology. Its importance as a social marker or as representative of the materials, techniques and technological know-how of a given era is unquestionable. Unraveling the intricacies of Greek dress terms, building the concept system of this domain, and publishing both terms and concepts as Linked Open Data, is to be the first step towards making this knowledge easily discoverable and reusable.

Our ontological modelling is informed by a theory of concept inspired by the international standards on terminology [16, 26]. According to ISO 1087 [16] concept is a "unit of knowledge created by a unique combination of characteristics"; characteristic is an "abstraction of a property of an object or of a set of objects; essential characteristic is a characteristic "indispensable to understanding a concept". Identify and define what

the objects and what the terms that designate them are, are constant ontological concerns in both textual and object-based research of Greek antiquity. The inclination and capability to classify, sub-classify and use the right terms is the dividing line between an expert and a lay person. As we have already shown [27-28], experts in ancient Greek dress and other domains of cultural heritage regret the "terminological vagueness" that prevails in their respective fields, blame it for hindering their work, and emphasize the need for consistent and consensual use of terms. As archaeological finds come down to us like a picture book without names, and as texts furnish names for objects, without providing illustrations, deciding "what was what' is not easy. Names, what the discipline of Terminology calls "terms", provide shortcuts to communicating what things *are*. Terms are words that belong in a domain-specific language, not general language [29]. Terms mediate between concepts and language. A term cannot exist without a concept, while a concept may have a verbal expression in Language A, but not in Language B. Concepts are abstracted from individual objects. They are the layer that mediates between 'reality', where objects live, and language, where terms communicate meaning about concepts. Concepts are bits of knowledge about the world, while terms are bits of language to verbally express this knowledge.

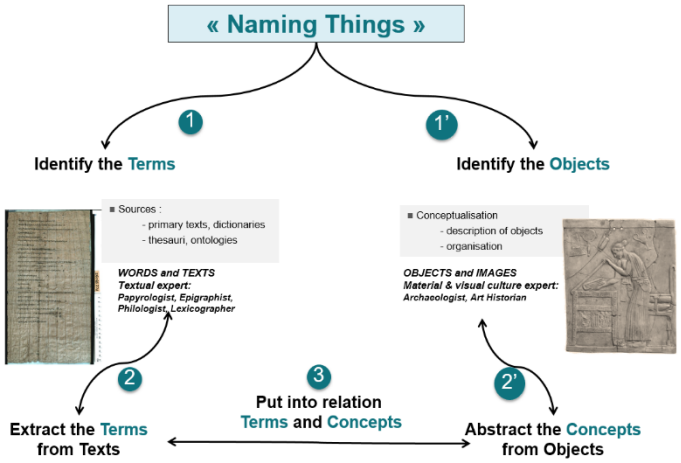

Fig. 2: Naming Things in the domain of ancient Greek dress

The move from linguistic-textual discursive to extra-linguistic meaning is important, when defining extra-linguistic entities, i.e., concepts and objects [30-32]. Our proposed solution for the domain of Greek dress, but also for experts seeking to "name things" in their respective domain, is to define the terms of the domain in relation to the concepts designated by these terms and build their term list in connection to the ontology made up by a concept *isa* hierarchy, whereby each concept (and term labelling this concept in a natural language) is made up of a list of characteristics, following the ISO 1087 standard for terminology work.

*The role of Artificial Intelligence (A.I.) in this endeavour* is to reduce the complexity of representing concept characteristics, concepts and terms and provide helpful automations to bridge the gap between classicists/humanists and the Semantic Web, while promoting two good practices for developing methodologies and tools in Digital Humanities: *intuitiveness* (of the theoretical and methodological framework to be devel-

oped), *ease-of-use* (of the software platform to be developed). To illustrate the complexity of modelling: i.e. 10 differences leading to forming disjoint categories (e.g. with or without sleeves), suffice to end up with a Porphyry tree of 1024 ($2^{10}$) terminal concepts. Selecting a terminal concept out of this complexity requires the aid of the machine.

Ontologies (in Computer Science) have been around for the last forty years or so [33-34] and OWL ontologies have been around since 2004. They are the best tool to describe domain knowledge, publish metadata compliant with Semantic Web and Linked Data standards, annotate resources, and query knowledge bases; they are the backbone of the Semantic Web [35]. But the standard language for ontologies in the Semantic Web is OWL (Web Ontology Language) [36]. Modelling in OWL using Protégé [37-38] (or another platform for editing [39]) requires reasoning in Description Logics.

*The reasons we opted out of building an OWL ontology in Protégé* are both epistemological & practical: first, reasoning in OWL using Protégé means reasoning in role restrictions, classes and individuals, data properties, object properties, A-box and T-box, which is hardly intuitive to those with no background in Description Logics and does not match the way classicists/humanists work. To do the modelling in this way, domain experts either need an ontology engineer, or have to think like one. Second, research has shown that human users do not fare well with highly formal systems, unless they have background in Computer science [40-42]. The Semantic Web is based on logical reasoning (first order logic), which requires a highly degree of formalization. The use of a formal language with clearly specified syntax and semantics, such as Description Logics at the heart of Semantic Web ontologies guarantees the consistency of definitions and the possibility to reason on these models, but is not consensus-oriented. It is much more intuitive to humanists to define the objects of the domain in terms of knowledge primitives that can be traced

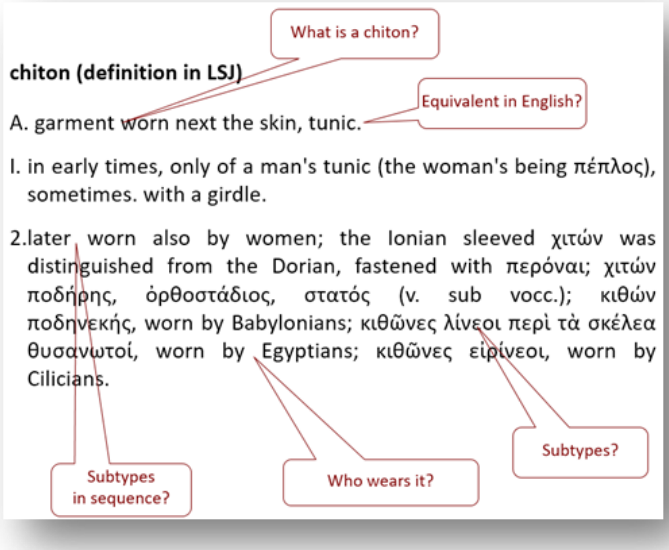


Fig. 3: Traceable knowledge primitives in the LSJ definition of *chiton*

in dictionary definitions, primary texts & archaeological objects. Fig. 3-4 illustrate the

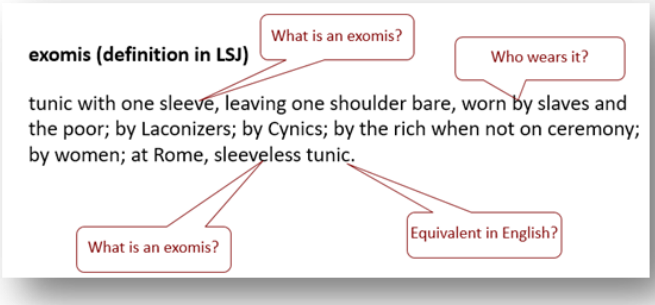


Fig. 4: Traceable knowledge primitives in the LSJ definition of *exomis*

knowledge primitives of *chiton* and *exomis* respectively traceable in its definition in LSJ [43-44, the standard dictionary used by classical scholars. These are: worn next to the skin, (initially) by men, (later also) by women. Additional characteristics subdividing this type of Greek garment into subtypes are included in the LSJ definition. Knowledge primitives can be a firm basis for consensus-reaching discussions among domain experts. Domain experts should be given common ground for agreeing (or disagreeing) on the definitions of terms and concepts. Description Logics does not guarantee a common basis upon which a dialogue among experts can exist. In contrast, semantic primitives of concepts can form a stable basis for scholarly discussions on the meaning of concepts and terms.

In order to build our domain ontology, we used Tedi [45], a software developed by the digital expert, which empowers domain experts. Tedi software supports both term standardization and customization. Standardization of terminologies relies upon expert agreement on domain knowledge, which is necessary for collaboration and rapid sharing of information. Customization accommodates and preserves the diversity of terms across languages. Tedi's complex architecture deploys two interconnected levels:

- the formal domain ontology level, which consists of an editor for concepts and an editor for objects. The editors of attributes, relations, and axes of analysis are accessible by means of the concept editor.
- the terminology level, which consists of an editor for terms and an editor of proper names.

For the user's convenience the interfaces are color coded: green for the conceptual dimension, blue for the linguistic dimension. Tedi allows ontoterminologies to be exported in different formats human readable, as well as machine tractable and Semantic Web compliant: HTML (static and dynamic), RDF/OWL, SKOS, JSON, and CSV.

### 3.3 A new scholarly workflow for building definitions for things

The Tedi tool-based method for building multilingual ontoterminologies is composed of 5 interrelated tasks, which do not necessarily have to be performed in a linear

fashion. The first step is to define the concepts of this complex domain in a formal language by means of specific axes of analysis. The next step is to associate each term with the concept made of the chunks of knowledge essential to defining it. Such modelling can structure knowledge so as to eventually support two types of queries: by means of keywords, and by means of concepts. Fig. 5 illustrates the linking of concepts to terms by means of selecting essential characteristics.

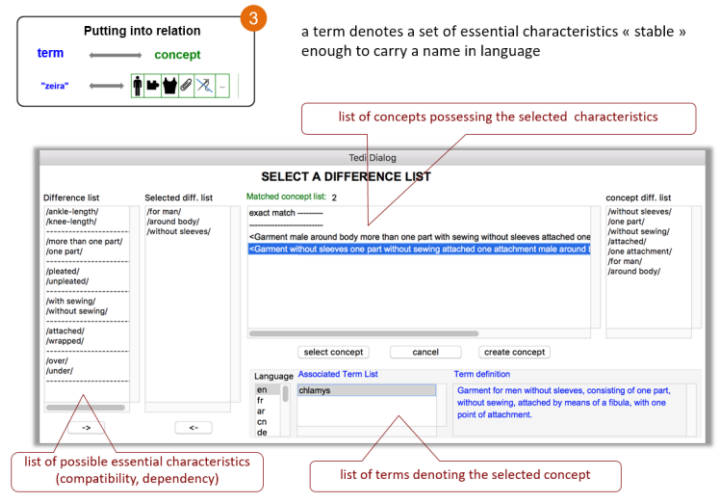


Fig. 5: Selecting the essential characteristics for *exomis*

The ontology has led to the building of an ontology-based online dictionary, whose definitions of term were definitions of thing. Using the example of the *exomis*, we have arrived at the following definitions, in English, French and Modern Greek:
“exomis” : Short and non-pleated garment for man, usually worn around the body directly on the skin, this sleeveless garment consists of two pieces of cloth sewn together along the sides, attached on the left shoulder leaving the right shoulder and part of the chest naked.

“Exomide” : Vêtement de corps pour homme, court, non-plissé et sans manches. Composé de deux pièces cousues le long des côtés, attaché sur l’épaule gauche laissant l’épaule droite et une partie de la poitrine nues, il est généralement porté directement sur la peau.

“Εξωμίδα” : Κοντό, χωρίς πτυχώσεις και χωρίς μανίκια ανδρικό ένδυμα, το οποίο συνήθως φοριόταν ως κυρίως ένδυμα. Αποτελούνταν από δύο κομμάτια υφάσματος ραμμένα στα πλάγια και στερεωμένα στον αριστερό ώμο που άφηναν τον δεξί ώμο καθώς και μέρος του στήθους ακάλυπτα.

The LSJ, the bilingual Greek-English dictionary commonly used in the field of classical studies, defines exomis as a “tunic with one sleeve”. This definition is not only incomplete, but also problematic with regard to the notion of “sleeve”: “The adjective amphimaschalos attributed to the Greek chiton in no way implies the idea of sleeves, but only, by its very etymology, that of the two armpits ... it is abusively, in my opinion,

that our translators or lexicographers speak of ‘sleeve’ tunics when it is a tunic with two armholes.” [46, our translation].

This approach led to building thing definitions, i.e. definitions of the concept denoted by the term, and was not aimed at representing term meanings in discourse. The result is precise and complete formalized knowledge allowing to verify logical properties for multilingual semantic searches and semantic annotations. The objective of our approach is not to impose definitions, but to propose definitions (in natural language) that are based on domain knowledge. This approach allows experts to discuss objectively on the basis of the essential characteristics on which they generally agree. Fig. 6-7 show the definition for *exomis* as exported in fully human readable and machine processible exports (dynamic HTML and OWL respectively). The Tedi Onto-Dictionary of terms and concepts will be deposited in Clarin.

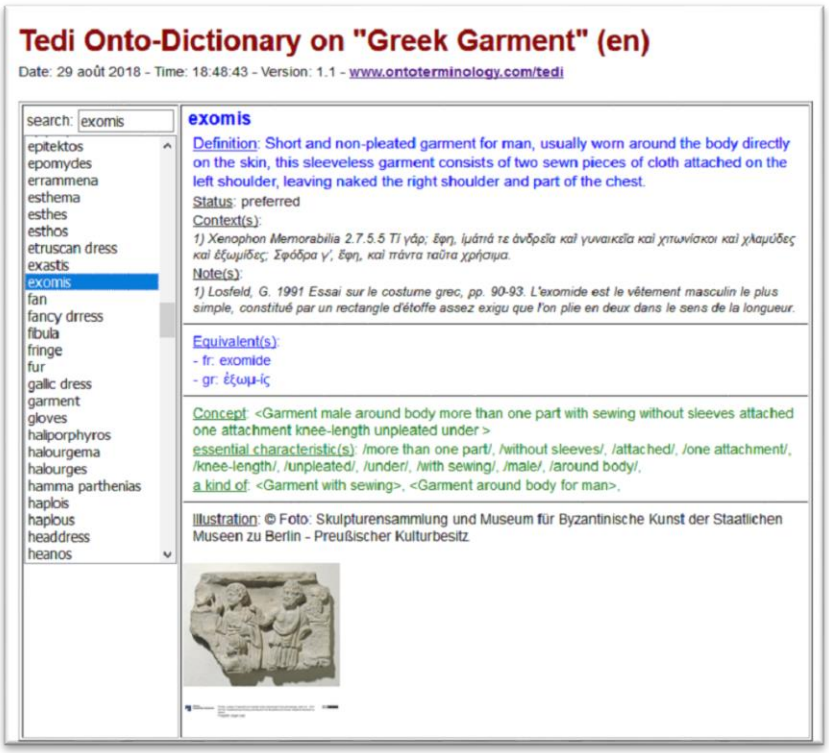


Fig. 6: Tedi export of the entry for term “exomis” in dynamic HTML


Fig. 7: A fragment of the ontology in OWL

# 4 Academic output & other achievements

The model for collaboration between a classical scholar and an Artificial Intelligence expert has numerous achievements to show for:

- The Onto-dictionary of ancient Greek dress;
- A new software for onto-terminologies standalone and in a proprietary language;
- A more recent attempt to model the domain of ancient Greek vases [47];
- Disseminating the idea of interdisciplinary collaboration between Humanists and Digital experts by means of Condillac-LISTIC (France) and KETRC (China).
- Testing their idea for ontological modelling of terminologies from Humanities' disciplines with colleagues from different communities (in international conferences and peer-reviewed journals) including a best paper award [51]: archaeologists (Institut français d'archéologie orientale-Cairo 30-31 October 2016), digital classicists and digital humanists (European Association for Digital Humanities 2018) [48], terminologists (TOTh 2016) [27], information scientists-librarians-archivists (AIDAinformazioni Journal) [28], translators-lexicographers-linguists (Lexicologie Terminologie Traduction-LTT) [49], Artificial Intelligence experts (Revue Intelligence Artificielle special issue on DH and AI) [50], computer scientists (several papers given in China [7], Semapro 2018 [51]).

# 5 The collaboration experience

## 5.1 The good stuff: a mutually empowering experience

Cambridge English Dictionary defines collaboration as "the situation of two or more people working together to create or achieve the same thing" [52]. Our collaboration flourished thanks to our positive attitude and openness. We agreed on the research goal, specific objectives, approaches, and methodology. Especially because this was a cross-border collaboration, online meetings were scheduled at regular intervals, having specified the details of the agenda beforehand. In terms of accountability, both researchers accepted full responsibility for the actions, as well as to disclose the results in a transparent manner. Our collaboration is informed by the principles laid out in the European Code of Conduct for Research Integrity [53].

### 5.2 The challenging stuff

In 1993 Turner and Cochrane [54] suggested that there are four types of projects according to two parameters: how well defined their goals are, and how well defined the methods of achieving them are. In our collaborative project the goal was clearer to the classical scholar and the method to the digital expert to start with. Each one had to familiarize oneself with the part which was less clear: the humanist had to cultivate the capacity to operate at a representational level involving types and instances. The digital expert had to adjust to the particularities, uncertainties and gaps in knowledge and information that are common when dealing with past cultures.

## 6 Suggestions for good practice

The first lesson learnt was that team work is mutually enriching and empowering. The second lesson was that the more one practices interdisciplinary collaborative research, the better one becomes at it. The third lesson is that if a digital solution is offered to Humanists, it should cater to the specific needs of the target community.

Collaboration is common practice among digital humanists. According to a recent study "digital humanities researchers engage regularly in collaborative research. One out of three respondents indicate that they collaborate very often with others on a research project. Altogether, seven out of ten say that they engage often or very often in research collaboration" [55]. If indeed practice makes perfect, digital humanists are well equipped towards setting up collaborations.

Knowledge modelling is interdisciplinary by definition: "In recent years the development of ontologies has been moving from the realm of Artificial-Intelligence laboratories to the desktops of domain experts" [56]. Making cultural heritage term-lists computable in order to link them to other types of resources (e.g., museum objects) is a problem-driven question (as is Ontology Engineering par excellence), not a curiosity-driven one, as in much of the research done in Classics and the Humanities. Our approach aims to show that in order to build workflows and tools that are better suited to the needs of the targeted community, similar interdisciplinary teams are a necessity. We advocate capturing domain knowledge with the help of domain experts, when building ontologies or terminologies whose conceptual system is a formal domain ontology.

How can scholars and digital experts maximize benefits from such collaborations? The answer is to provide training on how to change the way of thinking, i.e. training Computer Scientists on how to think like a Humanist (i.e., a researcher who seeks to understand and analyze how humanity manifests itself in different periods, cultures, media etc.) and train Humanities' scholars on how to think like a Computer scientist (i.e., someone who develops digital tools and media for real-life problem solving). Getting to understand each other's way of thinking raises awareness and improves not only the product, but also the process of the collaboration.

## References


1. Editorial: Journal of Material Culture, 1(1), (1996). https://journals.sagepub.com/doi/pdf/10.1177/135918359600100101, last accessed 2019/2/13
2. Lee, M.: The Peplos and the 'Dorian Question'. In: Donohue A. A. and. Fullerton M. D. (eds.), Ancient Art and Its Historiography, pp. 118-147. Cambridge University Press, Cambridge (2003).
3. Stears, K. E. Dress and Textiles. In: E. Bispham, T. Harrison, B. A. Sparkes (Eds.) The Edinburgh Companion to Ancient Greece and Rome, pp. 226-230. Edinburgh: Edinburgh University Press. (2006).
4. TOTh Workshop 2013, http://toth.condillac.org/workshop-2013, last accessed 2019/01/08.
5. Chlamys: The cultural biography of a garment in Hellenistic Egypt Periodic Reporting 1, https://cordis.europa.eu/project/rcn/195523/reporting/en, last accessed 2019/01/08.
6. Condillac Research Group in Knowledge Engineering at the University of Savoie, http://new.condillac.org/, last accessed 2019/01/08.
7. Knowledge Engineering and Terminology Research Centre at the University of Liaocheng, http://ketrc.com/, last accessed 2019/01/08.
8. Ballet, P., J. L. Fournet & M. Mossakowska-Gaubert: Artefacts from Egypt. Archaeology and Texts. Call for Papers. Workshop. IFAO-Cairo (2016).
9. Müller, M.: What was what in ancient Egypt? Terminology development project: art history and iconography. Paper read at the "Egyptologie et informatique" meeting, Würzburg, July 14th, 2000. (2000).
10. Dahl, C.-L.: The Use of Terminology in Medieval Scandinavian Costume History: An Approach to Source-Based Terminology. In: Andersson-Strand E. et al. (eds.) North European Symposium for Archaeological Textiles NESAT X. pp. 41-51, Oxbow Books, Oxford (2010).
11. Llewellyn-Jones, L.: Aphrodite's Tortoise: The Veiled Woman of Ancient Greece. Swansea: Classical Press of Wales. (2003).
12. Kim, W.-Y.: On the standardization of ceramic terminology. Current Anthropology 11 (2) 168. (1970). https://www.journals.uchicago.edu/doi/abs/10.1086/201121?mobileUi=0
13. Kirkland Lothrop S. Pottery of Costa Rica and Nicaragua, Museum of the American Indian, Heye Foundation, New York. (1926).
14. Claerhout A.: On the standardization of ceramic terminology. Current Anthropology 11(2), 168. (1970).
15. Sarri, K.: Conceptualizing Greek Textile Terminologies: A Databased system. In S. Gaspa, C. Michel, & M.-L. Nosch (Eds.) Textile Terminologies from the Orient to the Mediterranean and Europe, 1000 BC to 1000 AD. pp. 520-527. (2017). Zea Books, Lincoln, NE doi:10.13014/K27P8WJ3
16. ISO 1087-1:2000 Terminology work – Vocabulary – Part 1: Theory and application.
17. Papadopoulou, M.: Headdress for success. Cultic uses of the Hellenistic mitra. In: Brøns C., Nosch, M. L. (eds.) Textiles and Cult in the Ancient Mediterranean, pp. 65-74. Oxbow, Oxford (2017).
18. Sismondo Ridgway, B.: The fashion of the Elgin kore, The Getty Museum Journal 12, 29-58 (1984).
19. Balfet, H., Broutin, Y., Delaporte, Y.: Un essai de système descriptif du vêtement. Vêtement et sociétés 2, L'Ethnographie, vol. 92-94, Société d'ethnographie de Paris, Paris, pp. 363-373 (1984).

20. Delaporte, Y.: Pour une anthropologie du vêtement. Vêtement et sociétés 1, Actes des Journées de rencontre des 2 et 3 mars 1979, Laboratoire d'ethnologie du musée national d'histoire naturelle, Société des amis du Musée de l'Homme, Paris, pp. 3-13 (1981).
21. Eicher, J. B., Roach-Higgins, M. E.: Definition and classification of dress: Implications for analysis of gender roles. In: Barnes R, Eicher J. B. (eds.) Dress and gender: Making and meaning, pp. 8-28. Berg Publishers, New York (NY) (1992).
22. ICOM-Costume Vocabulary of Basic Terms for Cataloguing Costume 1982 http://terminology.collectionstrust.org.uk/ICOM-costume/, last accessed 2016/01/07.
23. The Getty Research Institute, http://www.getty.edu/research/tools/vocabularies/aat/ /, last accessed 2016/01/07.
24. Aimé, X., George, S., Hornung, J.: VETIVOC, une ressource termino-ontologique modulaire du domaine du textile, de la mode et de l'habillement. Revue d'Intelligence Artificielle, vol. 6, pp. 689–728 (2014).
25. ISO 21127:2014-CIDOC-CRM Information and documentation - A reference ontology for the interchange of cultural heritage information. http://www.cidoc-crm.org Definition of the CIDOC Conceptual Reference Model, Version 6.2.3 (May 2018).
26. ISO 704:2009 Terminology work – Principles and methods.
27. Papadopoulou, M. and Roche C.: Ontoterminology of Ancient Greek Garments. In: Roche C. (ed.) TOTh Conference Proceedings, pp. 73-92. (2017).
28. Papadopoulou, M. an Roche C.: Ontologization of Terminology. A worked example from the domain of ancient Greek dress. AIDAinformazioni Journal, 1-2/2018, XXXVI, 89-107. (2018).
29. Humbley, J.: Is terminology specialised lexicography? The experience of French-speaking countries. *Hermes, Journal of Linguistics* 18, 13-31. (1997).
30. Ogden C. K. & Richards I. A.: The meaning of meaning. A study of the influence of language upon thought and the study of symbolism. London: Routledge & Kegan Paul. (1923).
31. Kudashev I. & I. Kudasheva I.: Semiotic Triangle Revisited for the Purposes of Ontology-based Terminology Management. In: C. Roche (ed.). TOTh Conference Proceedings, pp. 83-100. (2010).
32. Roche, C. Le terme et le concept: fondements d'une ontoterminologie. In: Roche, C. (ed.), TOTh Conference Proceedings, pp. 1-22 (2007).
33. Guarino, N., Oberle, D., Staab, S.: What Is an Ontology? In: Staab, S., Studer, R. (ed.) Handbook on Ontologies, Springer-Verlag, Berlin, ISBN 978-3-540-92673-3, pp. 1-16. (2009).
34. Busse, J. et al.: Actually, What Does "Ontology" Mean? A Term Coined by Philosophy in the Light of Different Scientific Disciplines. Journal of Computing and Information Technology - CIT 23, (1), 29–41. (2015).
35. https://www.w3.org/2004/Talks/0412-RDF-functions/slide4-0.html
36. https://www.w3.org/OWL/
37. Musen, M.A.: The Protégé project: A look back and a look forward. AI Matters. Association of Computing Machinery Specific Interest Group in Artificial Intelligence, 1(4), June 2015 (2015). DOI:10.1145/2557001.25757003.
38. Tudorache, T., Nyulas, C., Noy, N. F., & Musen, M. A.: WebProtégé: A Collaborative Ontology Editor and Knowledge Acquisition Tool for the Web. Semantic web, 4(1), 89-99. (2013).
39. Lavanti, L. Evaluating and designing an ontology editor for domain experts (2018). http://urn.fi/URN:NBN:fi:aalto-201801261168
40. Horridge M., Tudorache T., Vendetti J., Nyulas C., Musen M., Noy N.: Simplified OWL ontology editing for the web: is WebProtégé enough? The Semantic Web - ISWC 2013,

Proceedings part I - 12th International Semantic Web Conference, pp. 200-215. Sydney New South Wales, Australia. (2013).
41. Dzbor, M., E. Motta, C. Buil, J. Gomez, O. Goerlitz, Olaf and H. Lewen Developing ontologies in OWL: An observational study. In: OWL: Experiences and Directions 2006, 10-11-2006, Athens, Georgia, USA. (2006).
42. Suraweera et al.: Using Ontologies to Author Constrained-Based Intelligent Tutoring Systems. In Ducheva D., R. Mizoguchi, J. Greer et al. (Eds). Semantic Web Technologies for E-Learning, (pp. 24-43.) IOS Press, Amsterdam-Berlin, Tokyo, Washington D.C. (2009).
43. LSJ s.v. chiton. In: Perseus 4.0, http://www.perseus.tufts.edu/hopper/resolveform?redirect=true, last accessed 8/1/2019.
44. LSJ s.v. exomis. In: Perseus 4.0, http://www.perseus.tufts.edu/hopper/resolveform?redirect=truelast accessed 8/1/2019.
45. Tedi (ontoTerminology editor), http://new.condillac.org/projects/tedi/, last accessed 8/1/2019.
46. Losfeld, G.: Essai sur le costume grec. Avec 8 planches de l'auteur. Préface de François Chamoux. Paris: Éditions de Boccard. (1991).
47. Desprès S., Roche C. and Papadopoulou, M.: Etude comparative de 2 méthodes outillées pour la construction de terminologies et d'ontologies. Submitted to TOTh 2019. http://toth.condillac.org/, last accessed 8/1/2019.
48. Papadopoulou, M. and Roche, C.: Structuring Humanities' Data through Formal Domain Ontologies: A Use Case from the Domain of Ancient Greek Dress In: EADH 2018: "Data in Digital Humanities", National University of Ireland, Galway 7-9 December 2018Galway, Ireland https://eadh2018.exordo.com/programme/presentation/61
49. Roche C. and Papadopoulou, M.: Définition ontologique du terme. Le cas des vêtements de la Grèce antique. LTT 2018, Lexicologie Terminologie Traduction, Grenoble (France), 27-28 septembre 2018 https://ltt2018.imag.fr/Resumes/Oral/LTT_2018_paper_32.pdf
50. Roche C. and Papadopoulou, M.: Rencontre entre une philologue et un terminologue au pays des ontologies. Revue d'Intelligence Artificielle, Numéro Spécial Humanités Numériques et Intelligence Artificielle (forth.)
51. Papadopoulou, M. and Roche, C.: Tedi: a platform for ontologisation of multilingual terminologies for the Semantic Web SEMAPRO 2018: The Twelfth International Conference on Advances in Semantic Processing. 18-22 November 2018, (2018). Athens, Greece http://www.iaria.org/conferences2018/SEMAPRO18.html
52. Cambridge English Dictionary s.v. collaboration https://dictionary.cambridge.org/dictionary/english/collaboration
53. All European Academies (ALLEA): The European Code of Conduct for Research Integrity 92017) http://www.allea.org/wp-content/uploads/2017/04/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf, last accessed 8/1/2019.
54. Turner, J. R. and Cochrane, R A. The Goals and Methods Matrix: coping with projects with ill-defined goals and/or methods of achieving them. International Journal of Project Management, volume 11, 2 (1993).
55. Dallas, C., et al.: European survey on scholarly practices and digital needs in the arts and humanities. DARIAH, DIMPO. (2017) https://hal.archives-ouvertes.fr/hal-01449002/document, last accessed 8/1/2019.
56. Noy, N., McGuiness, D.: Ontology Development 101: a guide to creating your first ontology / Stanford Knowledge Systems Laboratory Technical Report KSL-01-05, Stanford Medical Informatics Technical Report SMI-2001-0880, Stanford CA. (2001).