

Ontological Modelling of the Greek Intangible Cultural Heritage for Complex Geo-semantic Querying

Alkyoni Baglatzi (a) & Georgios Velissaropoulos (b)

(a) alkyoni.baglatzi@spotin.org
Spotlight on Innovation (Spotin) NPCC, <https://spotin.org>
(b) velissaropoulosg@yahoo.gr
Xorostasi NPCC, <https://xorostasi.gr>

Introduction

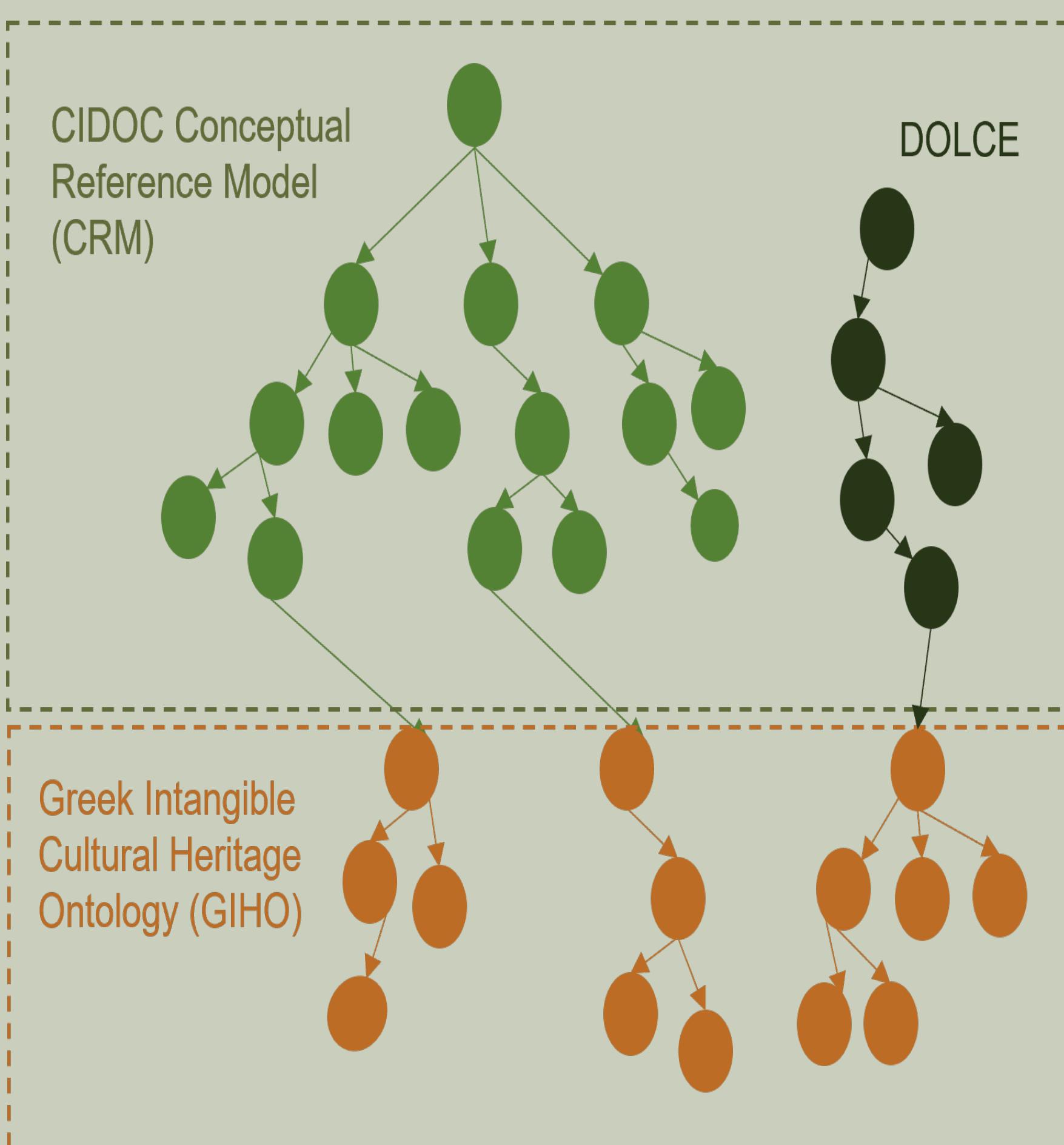
According to UNESCO, Intangible Cultural Heritage (ICH) includes all traditions passed over to us by our ancestors providing a sense of identity and continuity. Due to the evolution and changes of societies and the global character of our daily interactions, nowadays there is a big challenge in preserving important intangible cultural heritage assets of the past. Technology, though, provides a great opportunity to safeguard the wealth of these cultural assets and to pass it over to the next generations.

ICH data is very broad, including traditional dances and music, customs, oral traditions etc.

The current work focuses mainly on traditional music and dances of Greece which has thousands of traditional dances and songs, differing a lot from place to place.



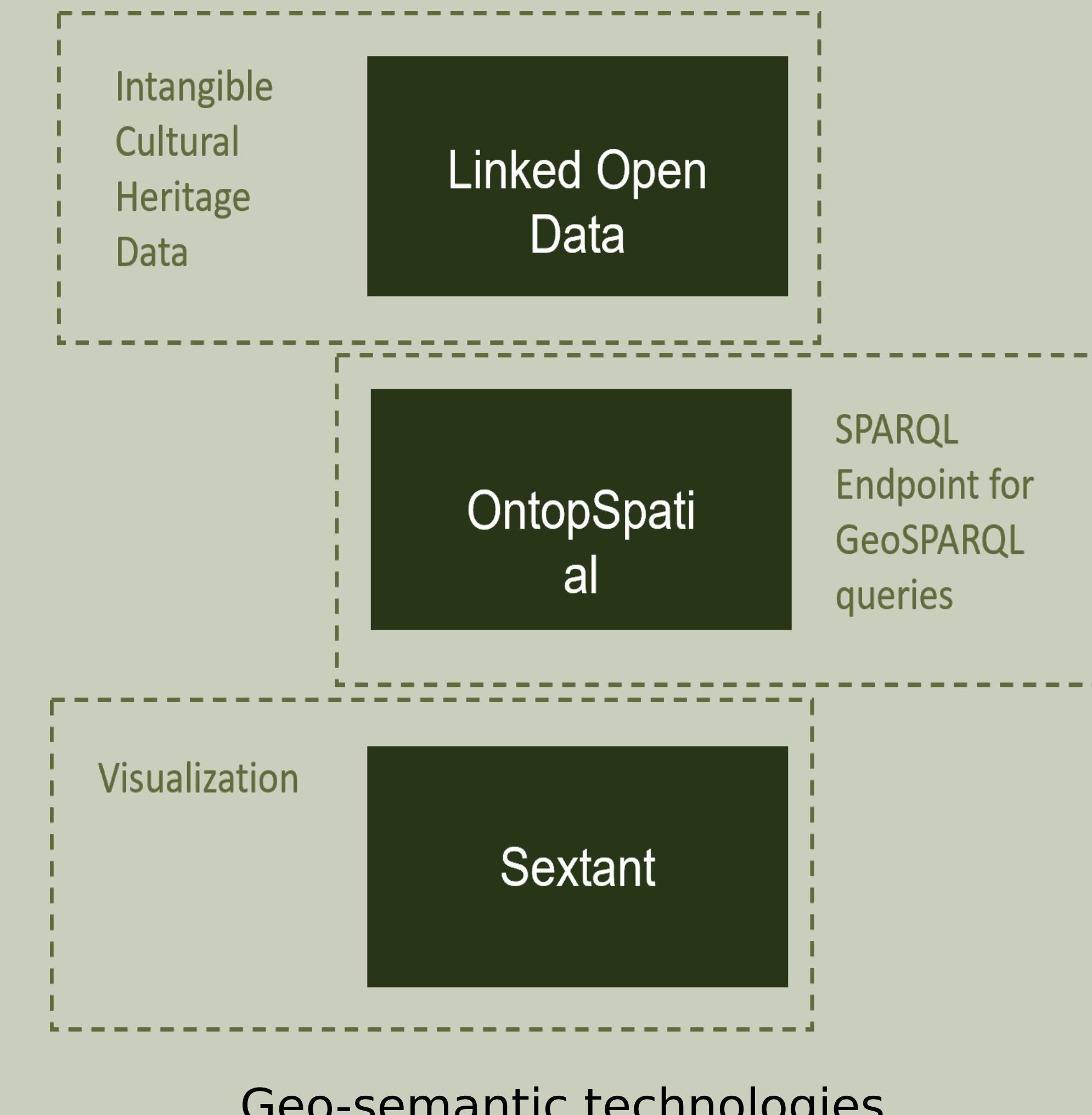
Ontologies



The importance of ontologies and Linked Open Data in the ICH domain has already been acknowledged in various approaches (Chantas et al. 2018; Hou and Wang 2019; Ziku 2020). CultureSampo (Hyvönen et al. 2008), a flagship project, introduced intelligent semantic web 2.0 technologies for cross-domain cultural heritage in the area of Finland. Europeana, the largest EU repository of cultural heritage data, uses Linked Open Data for providing the resources in an interoperable form. Regarding Greek ICH, important projects include iTreasures (Dimitropoulos et al. 2014), Wholedance (Camurri et al. 2016) and Terpsichori (Doulamis et al. 2017), demonstrating the important contribution of semantic web technologies for ICH preservation.

In this work, already developed ontologies and schemas such as the DOLCE ontology (Borgo and Masolo 2010), the CIDOC CRM (Crofts et al. 2008) are being adopted. For the formalization of specialized domain concepts, the **Greek Intangible Cultural Heritage Ontology (GIHO)** is being developed with special focus on the spatial and temporal parameters.

Methodology

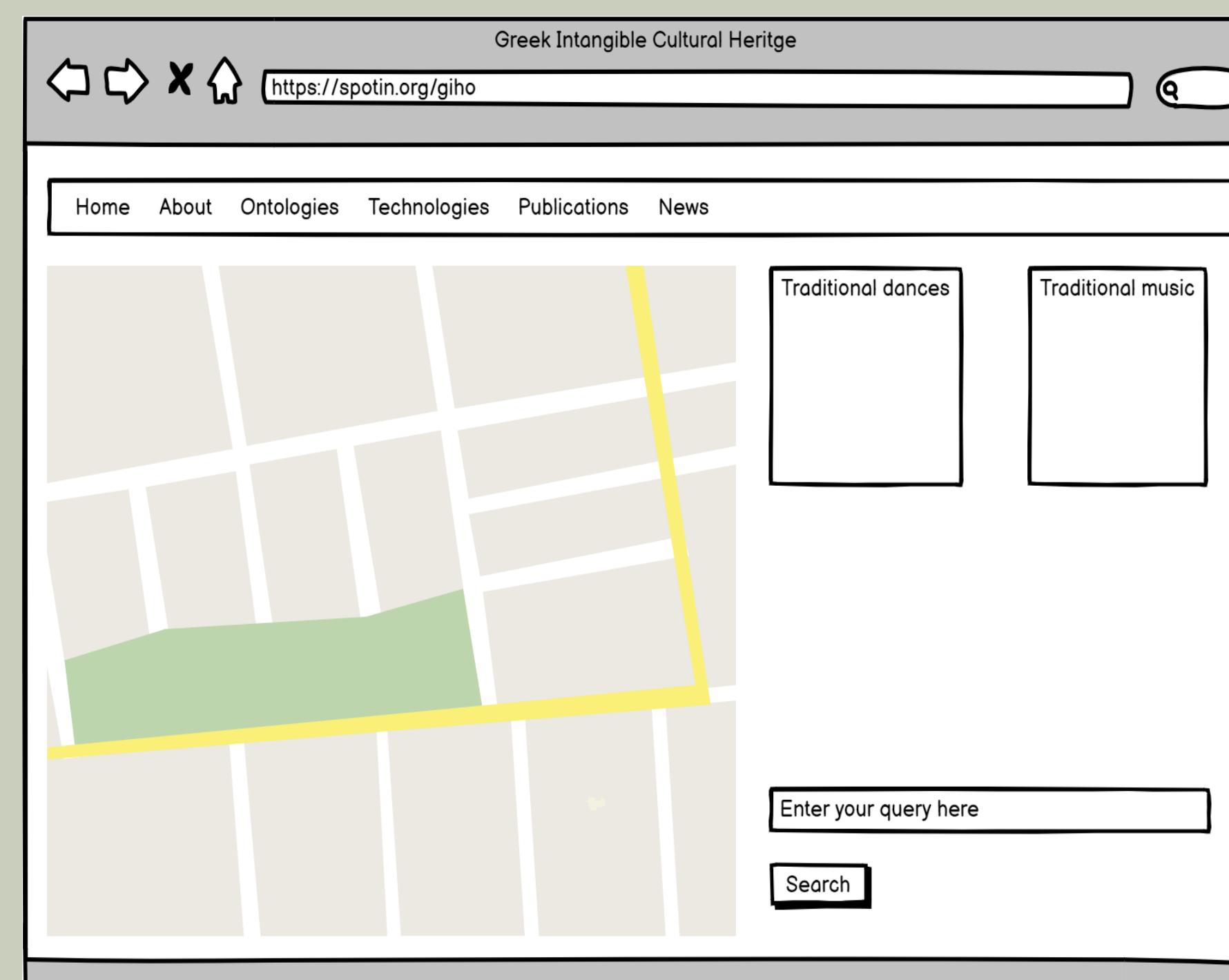


Geo-semantic querying platform

Maps are regarded as an enormously powerful and intuitive tool for visualizing data (Harley 2009) supporting critical thinking (Crampton 2001). The efficiency of maps has led to the development of the spatial humanities field demonstrating the power of maps for retrieving implicit knowledge of the past (Roberts 2016; Roberts et al. 2014). In the ICH domain though, maps have not been widely used so far.

Addressing this need, our work focused on maps as connectors of the ICH information, by developing a geo-semantic web map portal.

This map based web platform enables end-users either with a technical or non technical background to pose complex geo-semantic queries.



The OntopSpatial (Bereta et al. 2016) and Sextant (Nikolaou et al. 2015) tools developed by the University of Athens, are being used for the processing and visualization of complex spatiotemporal thematic queries, such as:

"Show me all the places where dances with 9/8 rhythms are found."

"Show me all the places where songs with the same lyrics and different music exist."

"Which are the dances of the village X?"

Through this process, users can have a better instant and collective understanding of the ICH data under one platform.

References

- Bereta, K., Xiao, G., Koubarakis, M., Hodrius, M., Bielski, C., and Zeug, G. (2016). *Ontop-spatial: Geospatial data integration using geospargel-to-sql translation*, in 'Proceedings of the 15th International Semantic Web Conference, Posters & Demonstrations Track (ISWC)'. Available at: <http://ceur-ws.org/>, Vol. 1690.
- Stefano Borgo and Claudio Masolo. Ontological foundations of DOLCE, pages 279–295. 09 2010.
- Camurri, A., Sarti, A., Pietro, S., Viro, V., Whalley, S., El Raheb, K., Even Zahar, O., Ioannidis, Wholdance: Towards a methodology for selecting motion capture data across different dance learning practice, pp. 1–2.
- Ioannidis, Y., Markatza, A., Matos, J.-M., Morley-Fletcher, E., Palacio, P. and Romero, M. (2016). *Wholedance: Towards a methodology for selecting motion capture data across different dance learning practice*, pp. 1–2.
- Chantas, G., Karavarsamis, S., Nikolopoulos, S. and Kompatitsaris, I. (2018). A probabilistic, ontological framework for safeguarding the intangible cultural heritage, *Journal on Computing and Cultural Heritage* (JOCCH) 11(3), 1–29.
- Crampton, J. W. (2001). Maps as social constructions: power, communication and visualization, *Progress in Human Geography* 25(2), 235–252. Crampton, J. W. (2001). Maps as social constructions: power, communication
- Crofts, N., Doerr, M., Gill, T., Stead, S. and Stiff, M. (2008). Definition of the cidoc conceptual reference model, ICOM/CIDOC Documentation Standards Group. CIDOC CRM Special Interest Group 5.
- Dimitropoulos, K., Manitsaris, S., Tsalamaniidou, F., Nikolopoulos, S., Denby, B., Al Kork, S., Crevier-Buchman, L., Pillot-Louisau, C., Adda-Decker, M., Dupont, S., Tilmanne, J., Ott, M., Alivizatou, M., Yilmaz, E., Hadjileontiadis, L., Charisis, V., Deroo, O., Manitsaris, A., DKompatitsaris, I. and Nikos, G. (2014). Capturing the intangible: An introduction to the i-treasures project.
- Doulamis, A., Voulodimos, A., Doulamis, N., Soli, S. and Lampropoulos, A. (2017). Transforming intangible folkloric performing arts into tangible choreographic digital objects: The terpsichore approach, pp. 451–460.
- Harley, J. B. (2009). Maps, knowledge, and power', Geographic thought: a praxis perspective p. 129–148. approach, pp. 451–460.
- Hou, X. and Wang, X. (2019). Modeling and representation of intangible cultural heritage knowledge using linked data and ontology, *Proceedings of the Association for Information Science and Technology* 56 (1), 409 - 412.
- Nikolau, C., Dogani, K., Bereta, K., Garbis, G., Karpathiotakis, M., Kyriakos, K. and Koubarakis, M. (2015). Sextant: Visualizing time-evolving linked geospatial data, *Journal of Web Semantics* 35, 35–52.
- Roberts, L. (2016). *Deep mapping and spatial anthropology*.
- Roberts, L., Thevenin, T., Hallam, J., Beveridge, A., Mostern, R., Southall, H., Cunningham, N. A., Schwartz, R. M. and Meeks, E. (2014). *Toward spatial humanities: Historical GIS and spatial history*. Indiana University Press.
- Ziku, M. (2020). *Digital cultural heritage and linked data: Semantically informed*.