

Semantic Web Technologies for CrossCult

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A brief introduction to CrossCult

CrossCult (www.crosscult.eu) is a three-year H2020 research project, which started in March 2016. It consists of 11 European institutions and 14 associated partners, from Computer Science, History and Cultural Heritage. The goal of CrossCult is to spur a change in the way European citizens appraise History, fostering the re-interpretation of what they may have learnt in the light of cross-border interconnections among pieces of cultural heritage, other citizens viewpoints and physical venues. Its aim is to enable a *unified, IT-facilitated history approach*, which goes beyond the conventional siloed presentation of historical data, and focuses on aspects that are cross-cultural, cross-border, cross-gender and cross-ethnic, in order to trigger substantial reflection on history as we know it, as well as on grant societal challenges, such as population movements, access to health services, women's place in society, power structures, etc.

To this aim, the project integrates innovations from different areas of Computer Science with Humanities research in order to:

- Develop pilot experiences that investigate the potential of situational curiosity and serendipity to increase the retention of historical facts linked by cross-border connections or crosscutting topics, gaining insight into the question of how the same facts may be interpreted differently from different social realities and by individuals with different cognitive/emotional profiles.
- Create a semantic knowledge base that interrelates an unrestricted set of (existing and future) digital cultural heritage resources and venues across different repositories, on the grounds of common properties or crosscutting, transversal concepts.
- Assess the impact of state-of-the-art technologies of geolocalization, micro-augmentations of reality, social networking, content adaptation and personalization in mobile edutainment apps for smart cities and smart venues.
- Automate the generation of narratives and the composition of digital cultural heritage resources in order to deliver meaningful interactive experiences to individuals and groups, taking into account their cognitive/emotional profiles, as well as temporal, spatial and miscellaneous features of context.
- Design business models and plans for the exploitation of the project results, assessing the viability and sustainability of the proposed knowledge base, technological platform and interactive experiences in collaboration with a new network of researchers, scholars, ICT professionals and specialists of digital heritage.

The role of Semantic Web in CrossCult

The CrossCult platform is a complex ensemble of software aimed to provide services to different types of stakeholders, including museum curators and experts, data scientists, cultural app developers and system administrators (through different web-based frontends) as well as current and future museum visitors (through Android or iOS apps). At the core of the platform lies the CrossCult Knowledge Base (CCKB), a repository for storage, management and retrieval of cultural heritage information, building on standard Semantic Web technologies to facilitate interoperability and linking with Linked Data resources. The conceptual backbone of the CCKB is formed by the following ontologies and vocabularies: (a) The *Upper-level Ontology*, which captures the cultural heritage and reflection semantics. It is designed in a way that enables augmentation, linking, semantics-based reasoning and retrieval across diverse cultural heritage resources. It consists of a carefully selected subset of CIDOC-CRM, some project-specific entities, and some elements of SKOS and Dublin Core. Its main innovative feature is the ontological definition of the semantics of *Reflective Topic*, a concept that encompasses all those connections that can be made to create a network of points of view with the aim to aid the reflection over a certain topic by enabling interconnections between physical things, such as artifacts from the venues collections, and conceptual things, such as stories about such artifacts; (b) The *Venue Ontology*, which accommodates the spatial semantics of different types of venues - from small museums to whole cities - relying solely on CIDOC-CRM; (c) The *User Ontology*, which is also compliant with CIDOC-CRM, but also uses elements of FOAF, as well as some project-specific entities to capture further characteristics of the users of the pilot apps, such as their interests and knowledge, their personality traits and visiting style, etc.; and (d) The *CrossCult Classification Scheme*, a faceted vocabulary structure, which aggregates terminology from standard thesauri resources, such as the Arts and Architecture Thesaurus of Getty, the EUROVOC, the UNESCO Thesaurus and the Library of Congress Subject Authorities vocabulary.

The aim of this talk at SW4CH-2018 is to give an insight into the ways in which the use of SW ontologies and vocabularies contributes to the history reflection and re-interpretation aims of CrossCult, as well as to the development of semantics-based services and applications for Cultural Heritage venues.

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