

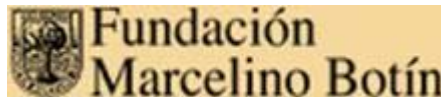


> Semantic Web Use Cases and Case Studies

Case Study: An Ontology of Cantabria's Cultural Heritage

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General Description

One of the aims of the “Fundación Marcelino Botín” is to transfer research and scientific discoveries to society through the funding of collaborative initiatives. The objective of this project is to build and exploit on the Web a rich ontology that captures eleven types of culture heritage for the Northern Spanish region of Cantabria, ranging from bibliographic items, to industrial patrimony, to prehistoric excavations.

The problem

The information currently representing the eleven heritages is dispersed, heterogeneous, fragmented and in varying stages of formalization and digitization. E.g. some exist in official government documents, others in published books and in expositions, many are digitized, and some are organized in databases. This situation hinders wide access to the information, causes serious integration problems, and makes exploitation of the information on the Web costly and tedious. Moreover, by its nature, cultural heritage is a domain with very dense interrelations within and between different heritages, which in the current situation are impossible to exploit.

The solution

The solution consists of using Semantic Web technologies for intelligent integration of the relevant information about Cantabria's cultural heritages. The project designs, constructs, populates and exploits the cultural heritage ontology, and also develops a methodology for the ontology population and exploitation for other regions. Exploitation is done through a Semantic Portal that aggregates different applications.

The ontology is based on several existing standards, such as the Conceptual Reference Model, developed by the International Committee for Documentation of the International Council of Museums and became an ISO standard in 2006 (ISO 21127 Information and documentation – A reference ontology for the interchange of cultural heritage information); Dublin Core (ISO Standard 15836) for resource descriptions; and the Functional Requirements for Bibliographic Records model (FRBR), a conceptual entity-relationship model developed by the International Federation of Library Associations and Institutions (IFLA).



Figure 1: Screenshot of the system

Population of the ontology is performed in a semi-automatic way from different sources including structured web pages, excel sheets, bibliographic xml records of Marc21, generic xml documents, and relational databases. The content of the ontology is (applying configurable filters) published in real time on the Web, while taking maximum advantage of the relations between its elements (serendipity)

In addition to rich navigation, the portal also provides semantic applications, including:

- A Semantic Search Engine, which allows to find information from the ontology using precise queries. For instance, the query “All books published between 1907 and 1917, and written by authors from Santander” returns a list of instances representing books rather than a list of links to documents.
- An Interactive Map (see Figure 2). Since the ontology contains geo-positions for resources like Sites or Places, and most of the instances have some relation to those concepts, they can be shown on a map. The Interactive Map application allows overlaying different domain layers (buildings, churches, caves, etc.) on the map in an interactive way and connected to the ontology.
- eLearning. This application generates SCORM learning objects that can be used by elearning platforms. The generated objects form courses according to selected topics. For example, selecting a person can generate a course focused on the life and work of the person.
- Tourist Applications. Several tourist operators offer added value to their travel products, in the form of cultural experiences related to the destination. The cultural ontology is perfectly prepared to offer such added value information (via web services) to online tourist applications such as cultural routes based on given topics (famous author, work, period, etc.)
- Semantic Wikipedia, which allows expert users to add new or modify existing data in the ontology.



Figure 2: Interactive Map

Key Benefits of Using Semantic Web Technology

Key benefits for the Fundación Botín include:

- An integrated, coordinated and richly-interconnected repository of eleven cultural heritages of its home region
- Transferring cultural knowledge in an economic and scalable way to society
- Providing a unique point of access for all people interested in cultural information of Cantabria
- The ontology guarantees interoperation between different applications, allowing easy addition of new ones
- Possibility to export knowledge and applications to different regions
- Since the ontology is based on existing standards, easy interoperation and federation is possible with other repositories

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