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Dolmen: A Linked Open Data Model to Enhance Museum Object Descriptions

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Abstract

This paper presents the DOLMEN project (Linked Open Data: Museums and Digital Environment), offering to develop a linked open data model that will allow Canadian museums to disseminate the rich and sophisticated content emanating from their various databases and to, in turn, make their cultural and heritage collections more accessible to future generations. The rationale, specific objectives, proposed methodology and expected benefits are briefly presented and explained.

Keywords: Linked Open Data; Museums; Canada

1. The DOLMEN Project

1.1. Rationale

Despite the latest technological advancements, the possibility for museums to provide access to their collections via the web remains a pressing concern for most. Many factors can explain this situation, the main one being incompatibility of data formats among museums. Cultural institutions often work in silos and do not use standardized description schemes. This lack of interoperability results in the near impossibility to exchange data among museums, therefore multiplying the colossal task of producing descriptions for the multitude of artifacts in their collection. The description of a museum object (e. g., a famous painting) in a museum database will usually include a restricted selection of information elements such as a simple photograph of the painting, the artist's name, the year of creation, the dimensions, the techniques used, and other basic descriptive metadata. In addition, specific managerial metadata (e. g., acquisition number, condition reports, storage notes, handling and manipulation of objects, information on crating, etc.), often judged irrelevant for the public, may not be displayed to the community at large.

Our research project, DOLMEN (Linked Open Data: Museums and Digital Environment), offers to develop a linked open data model that will allow Canadian museums to disseminate the rich and sophisticated content emanating from their various databases and to, in turn, make their cultural and heritage collections more accessible to future generations. A few linked open data projects, focusing specifically on museum objects, have recently been launched (Oard et al., 2014). However, these projects are not yet widespread, and most Canadian museums still hesitate to embrace that model. Given a worrying lack of financial resources, Canadian museums often feel helpless in the face of fast-paced technological evolution. This illustrates the pressing need to conduct extensive research on linked open data. The desire to transmit and share digital content requires museums to integrate a collaborative work logic, both among themselves and with other data providers. Making use of linked open data will answer three specific needs for museums: speeding up processes, gaining visibility and reducing costs. With the unprecedented potential of the semantic web and collaboration between researchers from different disciplines, the DOLMEN project will allow museums to offer expanded access to the descriptive multilingual content associated with their digital collections. In turn, this will allow them to address a broader public, which is, for most museums, a fundamental mission.

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1.2. Objectives of the Project

DOLMEN offers to examine the fundamental elements for the description of museum objects and model them by using linked open data. More specifically, three objectives have been established: (1) Theoretical: To understand the characteristics necessary for the description of museum objects of any kind; (2) Empirical: To define a model for the description of museum objects using linked open data; and (3) Practical: To strengthen data exchange networks among various cultural and heritage institutions. The DOLMEN project is a stepping stone towards implementing the semantic web, as envisioned by Berners-Lee, Hendler and Lassila (2001) more than a decade ago, with the aim of making cultural and heritage collections more accessible to future generations.

1.3. Proposed Methodology

The proposed methodology for the DOLMEN project comprises three phases. For the first phase of the research project, we will examine a sample of databases from Canadian museums of different types and sizes; a sample of 150 to 200 databases is considered. The museums will be selected to cover a wide array of museum objects that will eventually be described with DOLMEN.

Phase I of the project will start during fall 2016, will begin with an exhaustive inventory of open terminology databases, in English or French (Canada's official languages), that can be used for the description of museum objects. Non-textual databases will also be included and will come from all types of cultural heritage organizations. This survey will also be looking at existing descriptive standards, models and schemas (CIDOC-CRM, LIDO, CDWA-lite, EDM, etc.) in order to assess their suitability for the project. An analysis of large aggregation projects that are already in place (e.g., Athena, Smithsonian American Art Museum, Proof-of-Concept, etc.) will also serve as guidance to refine our methodology for the subsequent phases of the study. The results of this first phase of the study will provide the foundation of the DOLMEN linked open data model and guide us on a number of relevant issues, such as, differences in metadata formats, terminological aspects, cost and feasibility, and reliability of data providers.

Phase II of the methodology proposes model structuring using the descriptive elements and open data content identified in Phase I. This modelling comprises three main steps: (1) encoding of descriptive elements with the Resource Description Framework (RDF); (2) creation of links between metadata converted into RDF and open data sources, and other repositories; and finally (3) validation of open data links to ensure that data is accurate and that links to other open sources are properly accessible.

Finally, Phase III of the research project will involve the evaluation of DOLMEN. The assessment will focus on the linked open data obtained to estimate the completeness and specificity level of the model. This will be achieved by asking a sample of approximately 150 participants to examine and assess the data provided by DOLMEN which will in turn allow us to measure the degree of effectiveness and efficiency of the model, and to survey the participant satisfaction regarding the informational content offered by the model.

1.4. Expected benefits of the Project

The possibility to create links between different databases offers a wide range of possibilities to cultural institutions. The use of linked open data creates a new context for enriching museum objects descriptions within existing metadata records and linking them to semantically related resources. In other words, object descriptions will be improved by adding data provided by various museums and other cultural resources databases. DOLMEN is intended to be an innovative tool for both professionals working in museums and the general public. With the integration of text and multimedia content (e. g., 3D images, sound recordings, etc.) this will constitute a benefit for users with specific information needs. DOLMEN is leading the way to provide better access to Canadian cultural and heritage collections through linked open data.

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More specifically, linked open data will enable web users and third party organizations to integrate resources to create richer, more sophisticated and more interoperable metadata for museum objects.

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