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Citizen curation and NLP technologies for museums in the SPICE Project

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ABSTRACT

In this paper we briefly present some aspects of the EU H2020 Research & Innovation project "SPICE - Social cohesion, Participation, and Inclusion through Cultural Engagement" (2020-2023), which aims to develop methods and technologies to support citizen curation of museums. In this paper we will focus on the topic of multilinguality, connected with Natural Language Processing (NLP) and semantic technologies, and the case study located in the Turin Gallery of Modern Art (GAM).

KEYWORDS

Inclusion, Museums, Natural Language Processing, Citizen curation, User engagement

1. INTRODUCTION

The social impact of museums and their role in promoting social inclusion and cohesion is directly linked with their audience engagement. Museums, rather than providing an authoritative view, increasingly attempt to present multiple voices related to their collection and exhibitions, including from the museum visitors themselves, both in presence and at a distance [2]. Multilingual NLP and semantic technologies can facilitate inclusion of people and accessibility.

2. MUSEUM INCLUSION AND CITIZEN CURATION

Digital technologies can support not only the museum visitors' experience but also the remote engagement of people and the inclusion for all. Also due the COVID-19 pandemic, museums have to rethink the use of digital and remote interaction and its crucial role to open not only their collection but also to have an open dialogue with "visitors"[6]. Museum mission is changing and it is changing its role inside the society. This challenge is difficult and troubled as demonstrated by the still active discussion inside the International Council of Museums (ICOM) community regarding the new proposal for a definition of museum "*Museums are democratising, inclusive and polyphonic spaces for critical dialogue about the pasts and the futures. Acknowledging and addressing the conflicts and challenges of the present, they hold artefacts and specimens in trust for society, safeguard diverse memories for future generations and guarantee equal rights and equal access to heritage for all people...*"[1] This definition includes many aspects and points out also the principles of citizen curation and participation. These elements are crucial also in the Faro convention[2], recently ratified by Italy, that underlines these important aspects of heritage as they relate to human rights and democracy.

With regard to museums, the term "citizen curation" or "citizen curator" has been used for many years. In 2010 for example, Proctor [7] used it in questioning where the boundaries lie between digital and analog, in-gallery and online, curator, interpreter, and agent of social media. In 2013, Ride [8] involved citizens sharing contributions via Twitter which were later used in a video installation developed by the museum. The term was used in the context of the Paleo project [4]; Hill et al. [5] described citizen curation as a process in which citizens with little or no background in museum curation were taught and guided to create their own physical and virtual exhibitions. In the SPICE project, "citizen curation" is intended as a way of supporting visitors, both in presence or at a distance, to share their own interpretations of museum artworks and reflect on the variety of interpretations contributed by others, as described below.

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[1] ICOM Museum Definition https://icom.museum/en/resources/standards-guidelines/museum-definition/

[2] Council of Europe Framework Convention on the Value of Cultural Heritage for Society. Faro, 27/10/2005 https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/199

3. SPICE PROJECT

The SPICE project brings together 13 partners from 7 countries. The consortium comprises: seven research centres (Universities of Bologna, Aalto, Aalborg, Open University, Complutense University of Madrid, Turin, Haifa) with expertise in codesign, museology, HCI, Linked Data, narratology, ontologies, visualisation and user modelling; three enterprises focused on visitor guides (GVAM), mobile games (PadaOne) and Natural Language Processing (CELI); four heritage institutions (Design Museum Helsinki, Irish Museum of Modern Art, Gallery of Modern Art Turin, Hecht Museum).

The aim of SPICE is to build social cohesion, both between and within citizen groups by developing tools and methods to support citizen curation [2]. We define "citizen curation" as a process in which cultural objects are used as a resource by citizens to develop their own personal interpretations. Those interpretations are then shared and used within and across groups to reflect on similarities and differences in perspective. This development of a shared heritage can strengthen social ties within the group, thereby promoting social cohesion. These intra-group social ties can be described as bonding capital: the strength of social connections within a group. Interpretations can also be used to support social cohesion across groups, by both promoting tolerance and understanding of their differences and also recognising what they have in common.

4. SEMANTIC TECHNOLOGIES AND NATURAL LANGUAGE PROCESSING

The project will deliver a Linked Data infrastructure that will enable contributions to be shared and analyzed collectively across different authoring and social media platforms in order to avoid a technologically driven fragmentation of contributions. The infrastructure will enable communities to build and control their own perspective on culture and determine how this is shared with others.

Language barriers are a major challenge to overcome, as we have to support all languages spoken or used in case study countries, i.e. English, Italian, Spanish, Finnish, Hebrew and Italian Sign Language (LIS). We will therefore design a solution that provides both a native multilingual backend and high cross-language portability. As for LIS, an interpreter has been involved in the project. In addition to the local language, English will be used as a common language through all the case studies.

We will develop a real-time semantic annotation service for analysing multilingual texts, supporting the official languages of the case studies. The service will perform, via an API, term extraction, named entity recognition, sentiment analysis, emotion recognition, opinion mining, event detection and classification. We will initially train the service on multilingual corpora of relevant contents (e.g. comments, short stories, artwork descriptions) and then we will validate it within the 5 museums case studies. We will carry out the research in the application of neural networks and word embeddings techniques, e.g. BERT [3] and Laser [1], to new multilingual datasets, extending it beyond the state-of-the-art, and we will integrate these technologies with rule-based NLP components and multilingual domain ontologies.

An Interlinked Knowledge Graph obtained by aligning and linking different ontologies and data infrastructure will build on existing cultural, narrative, curatorial and social media ontologies, advancing the state of the art through knowledge integration and ontology engineering. In particular, the Knowledge Graph will provide a modular approach for: semantically describing interpretations across different media forms, ranging from collections to social media stories; semantically consuming, storing and reproducing interpretations; integrating interpretations descriptions with information about cultural objects; and associating interpretations with social activities, users and user profiles (e.g. authors, contributors, commenters). The SPICE ontologies will be available as a Linked Data vocabulary in order to promote exploitation and reuse by other institutions and projects. The ontologies, being oriented by design to the creation and reuse of interpretations of cultural objects, will provide an effective way to manipulate and retrieve narrative data by multiple (i.e. narrative, social, cultural, affective) dimensions.

5. GAM CASE STUDY

One of the project case studies is carried out by Gallery of Modern Art (GAM) in Turin. Drawing on the existing cooperation with the Turin Institute for the Deaf, GAM will work closely with the Institute to develop interpretation tools specifically tailored to the characteristics of the Deaf.

An app - specifically designed for the case study - will allow visitors to create and share simple stories during and after the visit of the museum, inspired by the exhibits. In this app, the use of text will be kept to a minimum, thanks the emphasis put on the visual features of the artworks and the use of a direct manipulation approach in the interface design,

so as to encourage its use by the Deaf. By leveraging the narrative and emotional representation of the artworks encoded in the project ontologies, the app will assist the users in creating their own stories, suggesting suitable narrative elements and artworks and helping them to explore the stories created by the other users, with the ultimate goal of encouraging the appreciation of diverse perspectives on art.

6.   ACKNOWLEDGMENTS

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