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General track

Alpinescapes: making the Alpine fringes visible trough OpenData and Crowdsourced Cartography

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Abstract

A recent redefinition of the Landscape concept promoted by EU institutions (European Commission, 2000), (JPI Cultural Heritage, 2010) stresses the importance of its social dimension, and of societal efforts in its construction and production (Castiglioni, 2009). Similarly, Societal Challenges permeate the debate around Cultural Heritage (European Commission, 2014). According to these documents such issues can be tackled by a combination of ICT technologies, applied to more transparent and participatory models of territorial governance (European Commission, 2014).
Building upon these premises, the Alpinescapes project poses itself as a novel tentative to link such multiple dimensions, by the means of FOSS4G (Free and Open Source Software for Geospatial), OpenData and Open licensing to collect, provide access and ultimately contribute to, the existing open content on the alpine landscape of Valsassina valley in Northern Italy.
Apart from building an easy-to-use platform for promoting tourism in the area, this experience sets an example in bridging the gap between the Users/Citizens and the Public Administration, in the collective representation of a territory, by the means of FOSS4G tools and OpenData.

Keywords

OpenStreetMap, OpenData, Cultural Heritage, Crowdsourced GIS, OpenGovernment, Web-mapping

1 Introduction

Seminal documents such (European Commission, 2000) and (JPI Cultural Heritage, 2010), posed a crucial milestone in underlining the Social dimension of Landscape, considered at the same time construct and product of contemporary societies, in a circular process in which citizens perceive, (re)construct and ultimately influence with their narratives, the Landscape. Such duality in the role of society becomes pivotal in the preservation and reproduction not only of the physical features of an area, but also of its culture and heritage (Castiglioni, 2009). The tight interconnections among these three

components (Society, Landscape and Heritage) is further stressed by H2020 3rd pillar *Societal Challenges*, which advocates for a combination of new ICT methodologies for harvesting modern fluid forms of data, in conjunction with innovative, open, paradigms of Governance (European Commission, 2014). From this premises follows that, for any action pertaining to territorial transformations, societal involvement in the form of civic participation becomes paramount.
Against this background the *Alpinescapes* project has been established with the aim of valorising and preserving the Landscape and Cultural Heritage of *Valsassina*, an alpine valley within the *Grigne* mountain range in the province of Lecco (Northern Italy). Despite the beauty of its landscape, Valsassina, in particular its innermost municipalities, suffers from a relative uneasiness of access (due to the geo-morphological connotations of its surroundings). This condition partially threatens the diffusion of a tourism based economy, which is on the contrary a flourishing sector in nearby territories, such as the world renowned Lake Como Riviera.
Henceforth, to conjugate EU's directives with the needs of a local community, this case study has chosen Open Geospatial Technologies and Open (geo)Data not only to act as a mere background or simply as a medium for collecting and representing already present information about the landscape, but as its entire foundation. Open community efforts such as OpenStreetMap and Wikipedia are in fact projects that, by virtue of their characteristics, can be considered the most suitable to allow a participatory process in which the end-user become at the same time sensor/producer, as well as consumer, of the information thus gathered (Goodchild, 2007).

2 Materials and Methods

Given the two main aims of the project (allow the exploration of the alpine landscape and contribute to open databases) a crucial part in devising the application has been the choice of its architecture, which had to exhibit an agile and open structure, allowing for a constant insertion and update of data (hopefully also produced by its users).

To reach such goals the project has been built with a lean format: At its core it's a single-page web-app, built on top of the open source project *icì* (Summers, 2014), with the relatively straightforward anatomy of a client-side application. It's built with FOSS geospatial javascript libraries, such as LeafletJS (http://leafletjs.com), able to retrieve JSON data via *HTTP GET* requests, and to serve them using the latest *HTML5*-compliant technologies. In this sense, the application becomes almost a "container" for displaying external data. This configuration, without the direct inclusion of any server or back-end applet not only avoids the complexity of maintaining and updating such infrastructure in face live ecosystems, such as the OpenStreetMap Database (OSM), but also accounts for the aforementioned flexibility in connecting multiple data sources.

With such characteristics in mind, the application offers mashups of geo-referenced information from heterogeneous data sources: 1) *Wikipedia* offers geo-tagged crowd sourced articles 2) *OpenStreetMap (OSM)*, from which ad hoc

geographic features are fetched, related to the mountainous environment, i.e. hiking and MTB trails, alpine refuges etc. 3) geo-referenced information about the local area history and heritage from *Comunità Montana della Valsassina*, a territorial public body. A fourth database, which at the moment of the writing is undergoing an evaluation finalized to it's release in an open format (the licensing should be compatible with the other above mentioned data sources), is constituted by layers of environmental interest from the Geographic Database of Lecco Province. These data, which will eventually be imported into OSM, will serve to enrich the map with more detailed landscape elements, not already traced.

To access the open data archives the application uses standard *HTTP GET/POST* protocol requests, connecting to the APIs of different query engines, such as Overpass API (http://overpass-api.de) in the case of OSM, or MediaWiki (https://www.mediawiki.org) for Wikipedia. The requests responses, obtained in plain *(Geo)JSON* are injected in real-time in the web-page, according to the features chosen by the user, and listening for his interaction with the map (panning/zooming, geolocation..). In order to achieve cross-browser and cross-platform compatibility standards, the web-application is written within the framework of Twitter Bootstrap (http://getbootstrap.com) and makes use of libraries such as JQuery (http://jquery.com) and Modernizr (http://modernizr.com). This combination ensures a responsive, mobile-first application, making *de facto* useless the implementation of different viewers to experience the content on multiple screen sizes.

The user interface is further devised according to common UX/UI practices: The app presents itself with a full screen map, which is a version of Mapbox Terrain layer customized with Studio (https://www.mapbox.com/mapbox-studio). A simple responsive navigation toolbar is present on top of it. The actual map-controls menu, featuring functions such as the geolocation and a geocoder, a LeafletJS plugin built on OSM Nominatim (http://wiki.openstreetmap.org/wiki/Nominatim), is present on the left-hand side of the screen, while a togglable content menu is present on the right-hand side. From this menu the user can display the paths and points of interest, as well as further refine his search, by selecting the features contained within a fixed-radius (500m) dynamic geographic filter, provided by MapboxJS APIs (http://mapbox.com). This option conveys an impression of the closest elements without the need to actually perform server-side spatial queries. Lastly, to foster contribution towards the open databases onto which is built, the app offers an “Edit in OSM” button, which directly links to OSM, as well as is able, with a functionality inherited by Summers (2014), to discriminate the eventual lack of references/images within a Wikipedia article, warning the user and asking for his help.

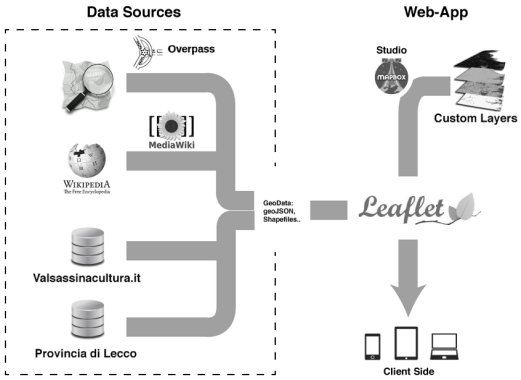

Figure 1 - App Conceptual Architecture

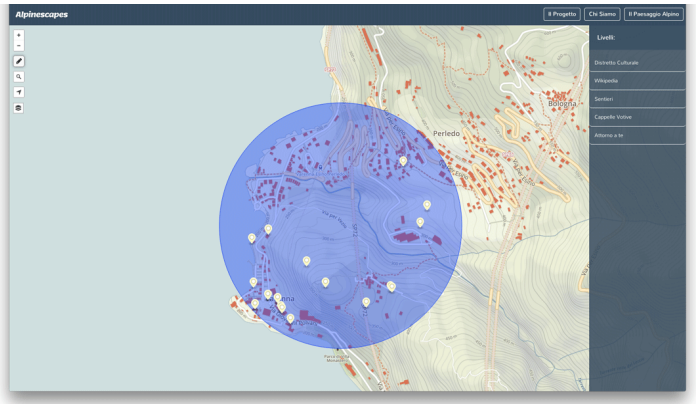

Figure 2 - User Interface (detail: geo-search radius)

3 Partial Conclusions

Alpinescapes thus poses itself in the wider disciplinary tradition of approaches exploiting user-generated content (Ratti, Pulselli, Williams, & Frenchman, 2006) and VGI (Goodchild, 2007) mixed with mobile computing, to render and translate complex ecologies of Information into more easy to access and interactive geo-visualizations. This let the users, to paraphrase Amoroso, Hudson-smith, Phillips, & Speed (2013), "*become instrumental in how the changing landscape is interpreted, rather than being passive viewers of the represented landscape*". Despite the straightforwardness of its architecture, the web-app further presents a rather positive initiative combining different datasets into an agile and open architecture, mainly suited for interacting with open licence databases. This operation is strategic in illustrating to the public sector, with a proven, factual example, the feasibility and the convenience of operating with such kind of data, and in particular with FOSS tools. An operation that should be especially relevant for the public sector in times of increasing expectations yet decreasing resources (European Commission, 2014).

4 Acknowledgements

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