

An End-user Development Architecture for Route-based Tourism in a Web 2.0 Environment

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Abstract

This research note is about a project aiming at elaborating an online platform for the promotion of route-based cultural tourism. In order to better meet tourists' expectations in terms of suitability and organisation of contents, an end-user development platform based on Web 2.0 technologies and mash-up tools has been designed. The platform appears to be complete, cost-effective, and easily updatable by domain-experts. A series of open issues researchers need to deal with in order to further improve the platform is outlined at the end of this note.

Keywords: Web 2.0; Mash-ups; End-user development; Route-based tourism.

1 Introduction

The process of publishing information on the web has been dramatically altered by the advent of Web 2.0: no longer do users need to possess a full-scale personal website to share information on the Internet; now they can express their comments and ideas through micro blogging, social networks, and other collaborative platforms. Web 2.0 has had a huge impact in tourism marketing as well, with more and more travellers using social networks and discussion forums to plan their journey. Web 2.0 also enables software programs to interact: thanks to a family of applications called mash-ups, existing data can be integrated, with no need to build content from scratch. Mash-ups can be easily used by domain-experts and their simplicity makes them an important instrument in the field of End-User Development (EUD): in EUD, experts of different fields that are not professional developers can use tools to create or modify software and organise complex data structures (Costabile *et al.*, 2006, Lieberman *et al.*, 2006). EUD tools have already being applies successfully in culture-related domains such as art guides (Celentano & Maurizio, 2011).

This research note describes a project applying Web 2.0 and mash-ups to the promotion of route-based cultural tourism. In Section 2, the context of the project is presented, together with an overview of the related literature. In Section 3, the functional architecture of a mash-up tool prototype is briefly described. In Section 4, some preliminary conclusions are finally drawn and the project's open issues are outlined.

2 Context

This research note refers to a project which has been developed by the Department of Economics and the Department of Environmental Sciences, Informatics and Statistics of the University Ca' Foscari of Venice. The project – supported by the local government – is about cultural tourism routes in the region of Veneto (Italy). As a final outcome, an effective online platform encouraging foreign tourists to visit Veneto's less famous cultural destinations is expected to be created.

In order to design an effective platform, researchers decided to first analyse cultural tourists' vacation planning process. Market research on foreign tourists visiting Italy for cultural purposes (ENIT, 2006; ISNART, 2011) confirms literature (e.g., see Buhalis & Law, 2008; Corigliano & Baggio, 2006; Kim & Fesenmaier, 2008) considerations about the vacation planning process in general: more and more tourists use the Internet to gather information about the destinations they want to visit and feedbacks from other web users who have already experienced a place and/or hotel, restaurant etc. Therefore, cultural tourism players have to gain an understanding of what potential tourists are looking for and implement the most persuasive online solutions (Loda *et al.*, 2009; Pourabedin *et al.*, 2011). First of all, as McKercher & du Cros (2003) demonstrate, cultural tourism players need to take into account that many typologies of cultural tourists exist, going from those who privilege the recreational and pleasure aspects of their vacation to those who are in searching of a deep learning experience.

At a practical level, this means that cultural tourism online marketing platforms have to be *information intensive* (Liu *et al.*, 2006; Pourabedin *et al.*, 2011): information about a specific destination has to be complete, so that tourists are able to choose those services and activities which better meet their needs. This is particularly important in the case of route-based tourism, where different components coexist within the same route and every tourist can plan her/his own itinerary according to her/his preferences. (Murray & Graham, 1997). As Pourabedin *et al.* (2011) underline, being *information intensive* also implies paying attention to *information design*: potential tourists should have easy access to the information they need and all the products and services of a destination should be effectively displayed. Pourabedin *et al.* (2011) add that online cultural tourism platforms should establish a close relationship with their visitors, in order to better understand potential tourists' needs and expectations and offer customised product solutions. In this context, language may play a prominent role as well. As Pan & Fesenmaier (2006) observe, tourism websites should take into account the fact that their users, i.e. the tourists, prefer subjective and experiential descriptions of places (e.g., action verbs) rather than promotional and marketing ones.

The use of Web 2.0 technologies and mash-up applications appears to the research team as the most effective solution to translate into practice the suggestions illustrated in the previous paragraph. As literature shows (Linaza *et al.*, 2008; Sigala, 2007), Web 2.0 and mash-up tools allow internet platforms to combine different sources of information and different typologies of content (blogs, videos, etc.), thus providing a complete overview of a tourism destination or route, including tourists' feedback and

comments. Furthermore, as Linaza *et al.* (2008) point out, the adoption of Web 2.0 in tourism-related platforms meet the expectations of a user who is already familiar with this collaborative form of communication and content generation when she/he navigates in the Internet. According to the research team, three additional motivations contribute to make Web 2.0 and mash-ups particularly suitable for this project. First, an online platform making use of these technologies is cost-effective: if good quality contents are already present on the Internet, parts of this material can simply be extracted by domain-experts and re-used (with proper mention of the original source), with no need to invest money and resources on content generation. Second, Web 2.0 and mash-ups make it possible for an online platform to be always up-to-date: if the material which has been extracted and re-used by domain-experts is readjusted (e.g., a website reporting the events taking place in a specific destination), there will be an automatic update in the platform's contents as well. Third, by taking advantage of some already existing material which has been generated by tourists (e.g., wiki travel guides), a Web 2.0 platform using mash-up tools may display its contents in that subjective and experiential language that Pan and Fesenmaier (2006) were suggesting.

3 Architecture

In this section, the architecture of this project's mash-up tool is outlined. The tool (see Fig. 1) is comprised of a back-end *authoring system* used by domain-experts to create/organise the contents, and a front-end *user application* used by tourists to browse these contents on their mobile devices. The data that populate the system originates from both an *internal database* and a Web 2.0 *cloud* that can be edited as usual by domain-experts as well as regular web users. Web data is parsed through a set of *component data interfaces* in order to convert the domain-experts' queries into structured information.

The back-end authoring system is used by experts to build interactive *tours* (i.e. cultural tourism routes) without any knowledge of programming languages. The information is organised as follows: each *tour* is an abstract topic of interest, like "*The Medieval Tour of Veneto*" or "*A Food & Wine Journey*". Each *tour* is comprised of one or more *places* (i.e. cities or towns); each *place* is associated with a set of *topics*; each *topic* represents a fact, object, or concept of possible interest to tourists (e.g. a local museum, an event, etc.). *Topics* are organised hierarchically in a tree-like structure to allow sub-specialisation of broader subjects. Each *tour*, *place*, and *topic* has a set of properties, like *name*, *description*, *picture*, and so on, which are stored in a local database. However, *topics* have also a set of attached objects, called *components*, which are used to mine information from the Internet. The type of each *component* defines the set of data mining parameters. In this preliminary phase of the prototype, the set of possible components is limited to: Wikipedia and Wikitravel for information on history, climate, landscape, etc.; Google Maps for geolocation, distance and other location-based information; Flickr to retrieve images, based both on keyword and location-aware queries; YouTube for video contents; and, finally, QWiki to give a quick audio-visual introduction to topics.

The user application parses the collected data in order to present the different tours to the final users, allowing them to browse and discover topics, experience multimedia contents, and so on. Even if this part of the software is still in an early stage of development, the project's aim is to target different mobile devices, both smartphones and tablets. Such devices, used by many travellers, have large screens, geolocation capabilities, Internet capabilities, and are well suited to display the collected information.

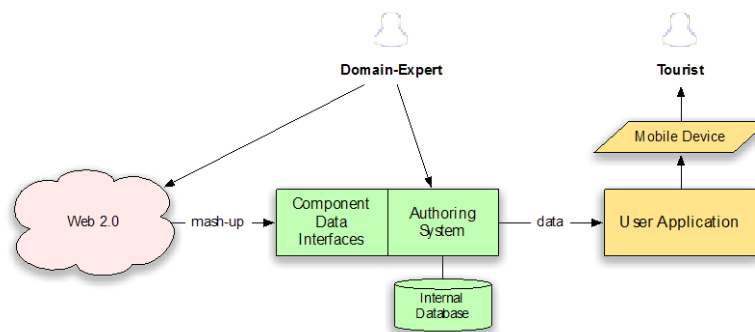


Fig. 1. Functional Architecture

4 Conclusions & Open Issues

This research note describes a preliminary effort to create an end-user development environment that allows domain-experts in the tourism field to aggregate both new and syndicated contents and organise this information in a way that is meaningful and useful for tourism promotion. The adoption of Web 2.0 and mash-ups in the framework of the present research project offers the following advantages:

- The future platform will provide a complete description of the different destinations, also thanks to the already existing online material.
- The future platform will make use of some already existing material written and structured in a way that is familiar to the Internet community.
- The integration of some already existing and constantly updated material will allow the future platform to be cost-effective and always up-to-date.

However, some issues linked to the adoption of Web 2.0 and mash-up tools need to be further investigated and examined:

- The authoring tool needs to be further refined and interfaced with more web data sources.
- The user application can be improved by adding the possibility for tourists of sharing contents (e.g., pictures or reviews) without having to leave the application.
- Researchers need to work out how to deal with potential negative comments about specific destinations/places that might be found in the already existing material.

- Researchers need to work out how to deal with those destinations/places for which the already existing material is inadequate or incomplete.
- Researchers need to test how local tourism authorities will react to the potential adoption of Web 2.0 technologies within the platform.
- Researchers need to analyse and review visitors' patterns platform usage in order to acquire further knowledge of tourists' behaviour and expectations.

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