Enhancing the Local Value of Thematic Cultural Tourism *

Bojan Bozic
AIT-Austrian Institute of Technology GmbH
Donau-City-Strasse 1
1220, Vienna, Austria
bojan.bozic@ait.ac.at

Sergiu Gordea
AIT-Austrian Institute of Technology GmbH
Donau-City-Strasse 1
1220, Vienna, Austria
sergiu.gordea@ait.ac.at

ABSTRACT

As result of the impressive development of transport infrastructures and ICT in the past decades, the cultural tourism registered an important growth, but there was also a shift of tourist demands towards personalized services and self organized itineraries. The current paper presents a service that aims at improving the experience of cultural tourist's visiting points of interest related to a given location and a given thematic. It demonstrates a way of using advanced ICT technologies for creating personalized itineraries, easy accessing cultural heritage and providing tourist assessment on thematic sightseeing. The online demonstration is based on the topic of Mozart footprints in Vienna.

Keywords

Cultural Tourism, Map Route, Personalization, Semantic Annotations

1. INTRODUCTION

Due to the rich cultural and historical heritage, Europe is nowadays the the world's No 1 tourist destination [1]. Apart from the European Cultural Capital events organized yearly, the European Commission also supports the development of trans-national thematic tourism products. The European Cultural Route is already a strong branding which can be enhanced through a better promotion and exploitation of local resources. In the group of technological drivers, the information and communication technologies combined with new search and mapping services provide opportunities for further development in cultural tourism. The current trend indicates a failing demand for package tours and increasing interest for individual holidays [7]. Consequently, the demand for personalization of tourism products and services registers and increasing trend.

*

[1]see `http://ec.europa.eu/enterprise/sectors/tourism/cultural-routes/`

PATCH 2014 Haifa, Israel

Over the past years, large amounts of cultural heritage objects were made available on the Web as result of extensive digitization campaigns. The European Digital Library (Europeana) provides nowadays a single point of access to 30 million books, paintings, films and museum objects provided by 2000 institutions. The Europeana Data Model (EDM) was developed in the last years with the goal of better integrating Europeana within the linked open data ecosystem [6]. In the current paper we present the demonstration of a service supporting (effective) personalized access to local cultural heritage resources for tourists and tour guides. This work presented here is carried out within the scope of Europeana Creative [2] project for supporting the development of Tourism Pilot.

The rest of the papers is organized as follows: Section 2 presents related work relevant for the current paper, while the Section 3 presents the main contribution of this paper which is divided in three parts. Section 3.1 presents and introduction in the application domain and shows the relationships between the cultural routes, local tourism and ICT support systems. The process adopted for creation of personalized cultural itineraries is presented in Section 3.2 and a demonstration based on a real world example is shown in Section 3.3. The conclusion and the plans for the future work are presented in the final part of the paper.

2. RELATED WORK

[7] presents a study carried out by the European Council having the goal to evaluate the value of the cultural routes and their impact on the society and economy in the given geographic area. The report shows a detailed analysis of drivers, trends and support networks in cultural tourism. Mohd Rodzi et. al present studies that looked at the various effects of tourism development including social, cultural and economical effects [11]. They show that tourists are attracted by cultural heritage sites and cultural tourism is highly influencing tourist satisfaction. The authors underline the relationship between tangible and intangible assets and the fact that they are both highly relevant for stimulating the cultural tourism. Marioti A. presents an overview and an analysis of the Europeana Cultural routes infrastructures, discussing the creation of cultural routes starting from thematic cultural heritage assets [8]. Still, the conclusions of this work point to an open question: how can the local tourism systems can be integrated, support and take benefits from the development of cultural routes?

[2]see `http://www.europeanacreative.eu`

Hall et. al present the progress in the PATHS project on supporting effective exploration of Digital Cultural Heritage spaces [4]. They research the personalization of information access by providing alternative browsing possibilities based on standard vocabularies, visual topics and tag clouds. The navigation paths are analyzed in order to improve the effectiveness of information access. Similar to this, Ceccarelli et. al. performs and analysis of the Europeana system logs [3] and compute semantic query recommendations to improve the search in Europeana repository [2]. Amin et al. present a user study researching to which extent a thesaurus-based comparison search interface improve the browsing support of linked cultural heritage resources [1]. They indicate how useful the thesauri based search is and how the visual representation of semantic topics help for browsing heterogeneous repositories. The linking between the semantic topics and web resources is supported by annotation frameworks like Yuma [12]. Milne and Witten introduce Wikipedia Miner, a toolset that computes the relatedness of semantic topics and identifys topics related to a given text [9].

The technologies used for interaction with geographical maps gained popularity in the last years. A system supporting development of map based applications by using Google maps is presented in [5]. The authors present a concrete implementation for management and retrieval of people's gardens by using the Google maps APIs. Pejic et al. present an expert system providing personalized access to information about points of interest by exploiting the user interaction with the map [10].

3. PERSONALIZED VIEW OF THEMATIC CULTURAL HERITAGE

3.1 Cultural Routes, Local tourism systems and ICT support

The cultural routes certified by the European Council are related to a certain thematic, spread over several countries, supported by many cultural institutions and SMEs. They connect closely related elements of tangible and intangible cultural heritage and create a novel system for accessing and experiencing this kind of knowledge. After the reduction of political and economical barriers in Europe and development of transport infrastructures, the cultural tourism started to gain more attention. It started to spread more in smaller urban regions and at country side.

While elder people are still interested in organized tours, the younger manifest interest for self organized travels, possible in area with poor tourism infrastructures. In the last years a number of initiatives have started that aim at improving the offers sustainable "slow tourism" (e.g. pedestrians or bicycle riders). They promote tourism assets in smaller tourist area that can be reached by walking, riding bicycle or riding horses. Anyway, the integration of the Cultural Routes with the local tourism support infrastructures is still not realized [8]. In the near future, the Information and Communication Technology (ICT) is expected to play an important role for integration of tourist infrastructures, information seeking and personalization of tourism services.

In spite of the technological advances recorded in the past decades, the retrieval of cultural object descriptions is still not an easy task due to the issues related to metadata based search such as homonymy, multilingual descriptions, spelling errors, ambiguity, etc. The current work makes a step forward for addressing these problems and providing ICT support for local tourism infrastructures.

The main contribution of the current paper resides in the development of a tourist/tour guide assessment service that is able to:

- Display a local Map containing cultural Points Of Interests (POIs)
- Identify semantic concepts related to a given thematic in the given geographic area
- Identify appropriate ways for accessing the tangible (physical) and intangible (digital) representations of these objects
- Provide personal feedback support through semantic annotations
- Generate visiting itinerary and tourist guidance

3.2 Process overview

The identification and documentation of the local points of interest related to a given cultural thematic is a content curation process. This is expected to be carried out by an domain expert (e.g. tour guide, tourism officer, librarian) which verifies the correctness of object descriptions, geo-location, etc. Identification of related concepts, additional descriptions and annotations can be performed by the tourists as well.

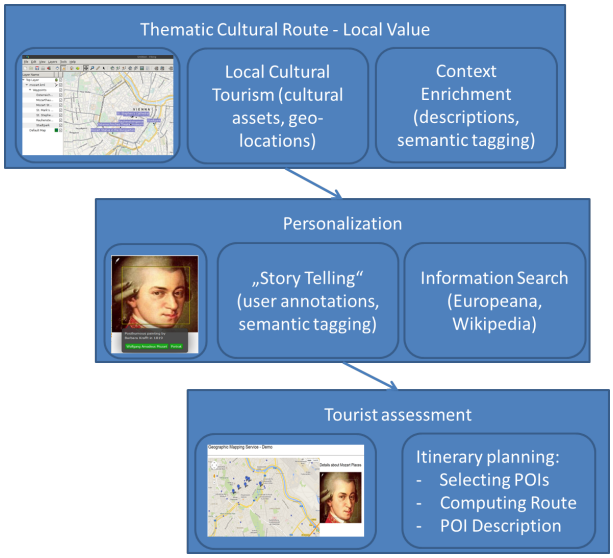

Figure 1: Process overview: Personalized access to local cultural heritage

Figure 1 sketches the overall process dealing with the personalization of the access to local cultural heritage. This is based on the idea of enhancing the local value of existing (thematic) cultural routes and comprises three main steps: identification of the local value of the cultural routes, personalization of the related information and tourist assessment.

Local Value. A successful thematic tour must aggregate a critical mass of POIs with a certain level of quality of their descriptions and a good balance between their relatedness and serendipity. The POIs are represented by a short

textual description and an representative image, on which the user annotations can be attached. Semantic tagging and thesaurus based search approaches are efficient technologies used to support knowledge discovery processes [1]. Within the provided service, these are employed to create a rich information context and promote the local cultural assets.

Personalization. In most cases, the cultural travelers are interested to find out details from the history of cultural assets and the message they were empowered to carry over the time. Details from the life of artwork creators, details about the social and political content in which they were created gain the tourist attentions. Consequently, a personalized "Story Telling" is the driver that enhances the tourist experience. This story might be based on the fragments of information available in open repositories like Europeana or Wikipedia and might aggregate additional explanations in form of user annotations. An entity recognition service is employed for providing users with support for identification of semantic concepts related to the current point of interest and accessing further information in external repositories (i.e. facilitated by the usage of semantic tags).

Tourist Assessment. The developed service is empowered with a simple, web-based, graphical user interface that allows users to easily access the information related to the given thematic in a visual way. By using the google maps API, the shortest path that connects the given points of interest is automatically generated. The tourists may follow the recommended itinerary and visualize rich contextual information by selecting (clicking) any point of interest on the map.

3.3 Implementation Details and Demo Description

For proving the value of the tourist assessment service we created a demonstration that exploits the footprints of Wolfgang Amadeus Mozart in Vienna (see Fig 2). This has the aim of enhancing the local value of the Mozartways cultural route for Vienna [3].

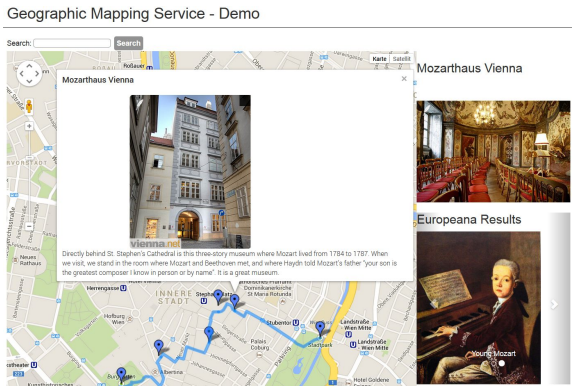

Figure 2: Demo: On the footprints of Wolfgang Amadeus Mozart in Vienna

Several points of interest were proposed as being closely related to the Mozart and his life. These include the statues that are placed in the Viennese parks (Burggarten and Stadtpark), the church where he got married (St. Stephen's Cathedral), the houses where he leaved and died (Mozarthaus and Rauhensteingasse) and the Austrian Theater Museum that holds several photos related to Mozart.

Sample user annotations and semantic tags where added on the images illustrating these POIs. For example, one can indicate that "Wolfgang Amadeus and Constanze Mozart got married in the St. Stephen Cathedral" and select the relevant named entities identified within this text (Wofgang Amadeus Mozart, Constanze Mozart, St. Stephen's Church, see Fig 3). More formation about them can be accessed by following the hyperlinks (i.e. for Wikipedia content) or within the carousel like image presentation (i.e. for Europeana content). Tourist may follow the map route that is automatically computed and connects the map locations of the POIs (see Fig 2).

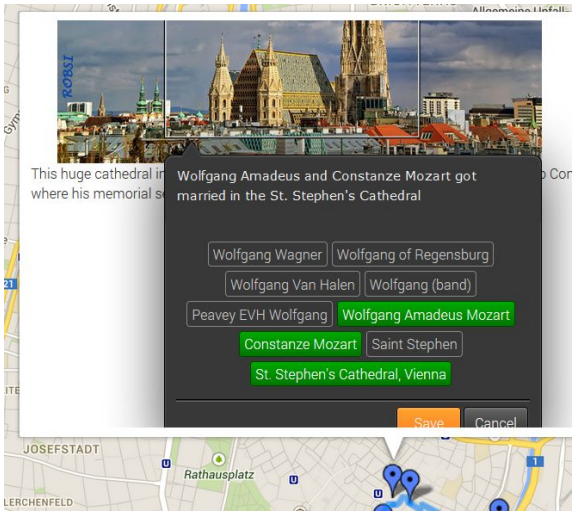

Figure 3: User Annotations and Semantic Tags

This demo is implemented using web technologies (mainly java/jsp and javascript) and makes use of several graphic elements and service APIs that are open source or freely available for use. The Viking GPS [4] tool is used for adding the POIs of interest and their descriptions on a geographical map. After exporting the POIs in an XML representation, we can import them both in Google Maps and Open Street Map. Annotorious and its semantic tagging plugin is used for providing image annotations [5], while the bootstrap carousel is used for displaying Europeana results [6]. The Europeana Search API[7] is used for querying the Europeana Repository, while the Google Map APIs[8] are used for rendering the map, the POIs and for computing the map route. The demo is available online at the following location: `http://62.218.164.177:8080/geomapping`.

4. CONCLUSIONS AND FUTURE WORK

The current paper proposes a solution for enhancing the local value of existing cultural routes. The concrete demon-

[3] `http://www.mozartways.com/content.php?m=3&lang=en&id=1241&m_id=1184`

[4] see `http://sourceforge.net/projects/viking/`

[5] `seehttp://annotorious.github.io/`

[6] see `http://getbootstrap.com/examples/carousel/`

[7] see `http://pro.europeana.eu/api`

[8] see `https://developers.google.com/maps/`

stration extends the Mozartways cultural route with descriptions of the relevant assets available in Vienna.

The service presented in this paper was implemented to provide user assessment for easy access to cultural assets. It is intended to be used by regular tourists for planing their visit to cultural destinations. In order to avoid language barriers and efficient access to tangible and intangible assets, the graphical user interface was design to use visual elements composed by maps, images and semantic tags. By now, the service is expected to be used using notebooks or tablets. For the following versions, we plan to use the responsive design paradigm and to support efficient execution on mobile devices as well.

Within the scope of Europeana Creative project, we aim to deploy the service in the Open Lab environment and demonstrate its value when organizing cultural events like the Cultural Capital - Mons 2015.

5. REFERENCES

[1] A. Amin, M. Hildebrand, J. van Ossenbruggen, and L. Hardman. Designing a thesaurus-based comparison search interface for linked cultural heritage sources. In *Proceedings of the 15th international conference on Intelligent user interfaces*, pages 249–258. ACM, 2010.

[2] D. Ceccarelli, S. Gordea, C. Lucchese, F. M. Nardini, and R. Perego. When entities meet query recommender systems: semantic search shortcuts. In *Proceedings of the 28th Annual ACM Symposium on Applied Computing*, SAC '13, pages 933–938, New York, NY, USA, 2013. ACM.

[3] D. Ceccarelli, S. Gordea, C. Lucchese, F. M. Nardini, and G. Tolomei. Improving europeana search experience using query logs. In *TPDL*, pages 384–395, 2011.

[4] M. Hall, E. Agirre, N. Aletras, R. Bergheim, K. Chandrinos, P. Clough, S. Fernando, K. Fernie, P. Goodale, J. Griffiths, O. Lacalle, A. Polo, A. Soroa, and M. Stevenson. Paths Ű exploring digital cultural heritage spaces. In P. Zaphiris, G. Buchanan, E. Rasmussen, and F. Loizides, editors, *Theory and Practice of Digital Libraries*, volume 7489 of *Lecture Notes in Computer Science*, pages 500–503. Springer Berlin Heidelberg, 2012.

[5] S. Hu and T. Dai. Online map application development using google maps api, sql database, and asp .net. *International Journal of Information*, 3(3), 2013.

[6] A. Isaac and B. Haslhofer. Europeana linked open data–data. europeana. eu. *Semantic Web*, 4(3):291–297, 2013.

[7] K. Khovanova-Rubicondo. Impact of european cultural routes on smesŠ innovation and competitiveness. Technical report, European Council, 2012.

[8] A. Mariotti. Local system, networks and international competitiveness: from cultural heritage to cultural routes. *Almatourism-Journal of Tourism, Culture and Territorial Development*, 1(5):81–95, 2012.

[9] D. Milne and I. H. Witten. An open-source toolkit for mining wikipedia. *Artif. Intell.*, 194:222–239, Jan. 2013.

[10] A. Pejic, S. Pletl, and B. Pejic. An expert system for tourists using google maps api. In *Intelligent Systems and Informatics, 2009. SISY '09. 7th International Symposium on*, pages 317–322, 2009.

[11] N. I. M. Rodzi, S. A. Zaki, and S. M. H. S. Subli. Between tourism and intangible cultural heritage. *Procedia - Social and Behavioral Sciences*, 85(0):411 – 420, 2013. <ce:title>AcE-Bs 2013 Hanoi (ASEAN Conference on Environment-Behaviour Studies), Hanoi Architectural University, Hanoi, Vietnam, 18-21 March 2013.</ce:title>.

[12] R. Simon, J. Jung, and B. Haslhofer. The yuma media annotation framework. In *Proceedings of the 15th International Conference on Theory and Practice of Digital Libraries: Research and Advanced Technology for Digital Libraries*, TPDL'11, pages 434–437, Berlin, Heidelberg, 2011. Springer-Verlag.