Metadata for Improving Dynamic Tourist Packages

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Summary:

The use of Semantic Web technologies allows us to annotate information sources on tourism services and products with the concepts included in a defined ontology. The enriched information can be used to match tailored package holidays to client preferences and according to real time availability.

This paper presents the ANOTA project approach to aggregation of tourism information according to user and destination management strategy. The main hypothesis is that an official promotional tourist information portal can integrate tourism information from different sources and present it in an aggregated way, according to current user search and marketing strategy.

Keywords:

Semantic Web, annotation, tourism ontology, dynamic packaging, information integration, syndication, metadata.

1. Introduction

In the tourism market there is a predominance of SMEs from different subsectors. Value-chain integration consists of the combination of various tourism services. A holiday package comprises diverse tourism services –transport, accommodation, activitiesand this combination is the origin of key value.

The use of Semantic Web technologies can facilitate the integration of tourism information not only about sources or providers but also about available services.

Information on tourism sources and services on offers to consumer are described using concepts of a specific ontology, defined according to destination characteristics and its resources.

The official destination portal presents aggregated information. In the ANOTA project, co-funded by the European Union, Spanish Ministry of Science and Education, the pilot implementation is done at the Balearic Islands. According to marketing strategy, the DMO (Destination Management Organisation) highlights information about specific resources in the portal at certain periods. Besides, the user searches information according to their preferences. The novelty of the pilot is that the results of a search are shown aggregated, covering all services - accommodation, transport and activities- needed to arrange a trip. The result only shows resources available for the dates and resort chosen. This is possible due to the association of services with the semantic concepts defined in the ontology. The search is carried out simultaneously on different information sources and results are shown in the portal as an integrated view.

The Semantic Web, semantic annotation of tourism resources and syndication of semantically enriched contents will improve the access to disperse information on the Internet. This way, in industries as heterogeneous and fragmented as in the Tourism Industry, it is necessary to standardise the way services and rates are disseminated. Thus, users can access easily to find and purchase what they are looking for. One of the objectives of the ANOTA project is to demonstrate how tourism information annotation will work applied to dynamic packaging of tourism services in a real-world scenario. This will allow better access to services, and the user can organise easily their own tourist package.

2. Scenario description and user interface

The ANOTA project, via a Semantic Web pilot, aims to combine information from different portals. The added value is that the users will be able to

assemble their own holiday components and create their own tailored package. The user will not need to visit every web-site that provides information on a selected destination, but from a unique portal will have access to all information on tourism services from the Web.

The destination chosen to implement the ANOTA project pilot on the Semantic Web is the Balearic Islands.

Three types of portals provide the information, which will be semantically annotated:

- Those providing mainly cultural and destination information
- Portals providing accommodation information and services
- Portals providing flight information and transport services

Also, providers will be able to add their RSS feeds referring their offers, semantically enriched, in order to include them into the search portal.

The following figure (Figure 1) shows the mainframe of the search portal that will be used by the user.

Figure 1. Users interface Mock-up of destination portal (see A4 figure in annex)

Results of the search will be shown in an aggregated way. If a user is interested on a certain event, for example "Copa del Rey de Vela", the application will suggest flights available for the competition dates and accommodation vacancies situated close to the competition location. Then, when a user performs a search including their preferences – places to visit, dates, etc. – the results will not only cover the relevant searched information, but also information about complementary offers that could be interesting for the user.

First, the user visualises the results of the search performed (Figures 2 and 3), and then can access complementary services for dates and location without

any additional effort. Besides, the shown results are only the ones available and directly related with the expressed preferences.

Figure 2. Results display. Planning a trip to Majorca and Minorca (see A4 figure in annex)

Figure 3. Results display. Available accommodation for selected dates and locations. (see A4 figure in annex).

3. Architecture and process

Tourism enterprises will provide information, which will be semantically
enriched with an annotation tool, in two formats, depending on the type of information:

- RDF [1] sources, which will contain information on geographical areas, provider's information on vacancies and availability (accommodations, ...).
- Feeds RSS 1.0 [2], which will contain information with an advertising component, as flight and accommodation offers.

The architecture is based on Sesame RDF Repository [5][6]. Sesame is used as a directory to

register and discover sources and feeds, and to store metadata for the aggregation portal. The SeRQL query language [7] is used to perform the queries.

The annotator tool is the user interface for administrator to interact with the sources directory. The aggregation portal will search sources and feeds in the directory, according to the criteria expressed by the user.
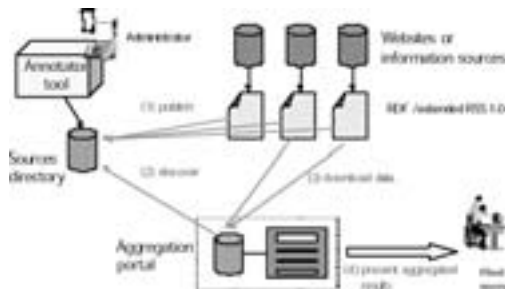
Figura4 General view of the process (see A4 figure in the annex)

The process is also shown in the Figure 4. Before incorporating tourism information sources into the system, an analysis of the source will be done in order to differentiate between descriptive information and information with an advertising component (flight, accommodation and events/activities offers). This will determine which information will be described using RDF and which in extended RSS 1.0.

A service provider will be able to register its source in the directory by means of filling in a form. An administrator will validate the enterprise information and refine the description of the source according to the concepts of the ontology.

Users with a single interface (aggregation portal) will carry out the searches. The application will discover relevant sources and collect data from the sources according to search parameters and its semantics, avoiding a download of available information from all sources.

4. Definition and use of the ontology

Tools that are currently available on the market are stable enough for ontology development. The tourism ontology used in the ANOTA project has been edited using Protegé [3].

The ontology has been defined to annotate the content of the different sources to be integrated (flights, accommodation, activities). This ontology is also used to extend RSS 1.0 to include more semantic structures in these type of feeds. This will allow for reusing these feeds by blogs aggregators in the future ("Semantic Blogging") [4].

The ontology has been created reusing parts of a previous defined ontology -as the work done by the Open Travel Alliance (OTA) [8]- in order to define the concepts used in the user interface.

Figure 5. General view of the tourism ontology (see A4 figure in annex)

5. Conclusion

This pilot experience will enable the advancement to the concept of Dynamic Packaging, present in the Tourism Industry, with the use of Semantic Web technologies.

The advantage of using semantic annotation regarding other types of technologies is the possibility of combining and visualising the information coming from diverse and different sources according to a common view in an aggregated way. Thus, the information is visualised and organised in the "front office" according to the data schema defined in the "intelligent search" portal and not as determined by each data structure of the original sources of the tourism information.

Apart from benefiting the final user, this will also have an important effect for SME's as their webs have more opportunities to be found and visited. The fact that a tourism entrepreneur enriches their information with metadata and syndicates it, gives more visibility and promotes distribution on other channels. Thus, it gives an added value as it enables aggregation of the information in tailored tourist packages.

Moreover, the destination marketing portals will be more complete, as they will not only offer general tourism information, but also real ontime availability of vacancies according to searches carried out by users.

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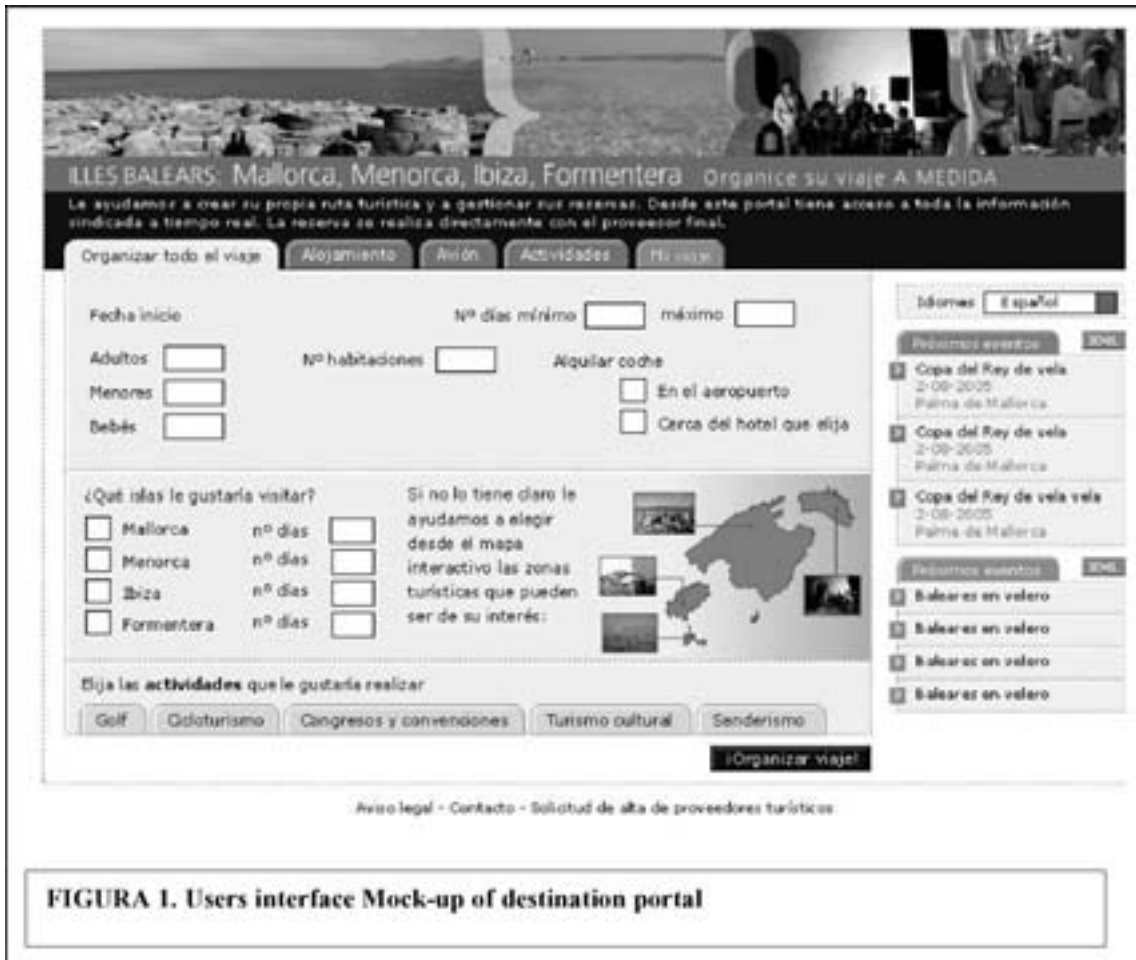
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8. Annex

FIGURA 1. Users interface Mock-up of destination portal

FIGURA 2. Results display. Planning a trip to Majorca and Minorca

FIGURA 3. Results display. Available accommodation for selected dates and locations.

Figura 4. General view of the process

FIGURA 5. General view of the tourism ontology