

eZaragoza, a tourist promotional mashup

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Abstract. Zaragoza city council has deployed a tourist promotional mashup, called eZaragoza. This mashup allows the access to tourist information from different data sources, both internal and external. eZaragoza is built on EzWeb, a mashup platform where application components (gadgets) exchange information among them. The core data used come from a public dataset available as Linked Data. In this document, we mainly put the focus on how Linked Data can be consumed by a mashup platform.

1 Introduction

With a population of 700,000, Zaragoza (Saragossa in English) is the fifth most populated city of Spain. Zaragoza's cultural heritage traces back to its Roman foundation, and includes a rich and representative set of samples of several artistic periods and styles, such as Gothic, Mudéjar, Renaissance or Contemporary, part of them have been declared as UNESCO World Heritage. Zaragoza is also famous for its folklore, a renowned local gastronomy and enjoys a very dynamic cultural agenda, as well as frequent top-level sport events.

Zaragoza's City Council owns extensive relational databases with all the aforesaid information. Since 2008 these data are also publicly available as Linked Data [1]. This dataset is one of the outcomes of the integration effort carried out as part of the CRUZAR project [4], which has been recognized by W3C as one of the Semantic Web Case Studies³. A SPARQL endpoint exposes information about the monuments and historical buildings of the city (2534 items), restaurants (598), accommodation (127), shopping areas (35), and a dynamic list of cultural events and leisure activities (hundreds). Descriptive data are augmented with georeferenced information and multimedia links.

A new project, eZaragoza, was started with the aim to explore how mashup platforms can be used to consume Linked Data. For this purpose, EzWeb platform was selected. EzWeb⁴ is an open source mashup platform where applica-

³ <http://www.w3.org/2001/sw/sweo/public/UseCases/Zaragoza-2/>

⁴ <http://ezweb.morfeo-project.org/>

tion components, (known as gadgets in this platform⁵) can be interconnected (“wired”) to allow them to exchange information.

2 Visualizing Linked Data

From the data consumer point of view, Linked Data opens the door to an ocean of data. Complementary statements about the very same real world entity, such as a monument, may be combined together into an information-rich description, due to the RDF data model [3]. These statements may come from a variety of sources and offer different perspectives of the same resource. Typically, tourist information can be gathered from CMSs, relational databases, spreadsheets, geographical information systems and multimedia repositories.

Once all the relevant information pieces are integrated, the need for appropriate mechanisms for visualization and exploitation arises. The heterogeneity and the volume of the available information are a challenge for designing user interfaces which balance between the completeness of the selected subset of the data and the ease of use. Our proposal is to define several views of the data and to offer each one as an autonomous user interface component, i.e. a gadget. For instance, subsets of information about a monument can be displayed using different gadgets (see Figure 1). On the one hand, a factsheet gadget based on an attribute-value description offers a summary of some properties of the monument (name, human-readable description, classification, opening hours, etc.). On the other hand, another gadget uses either the monument geographical coordinates (if available) or its postal address to display its location in a map of the city.

The mashup platform empowers the user to pick the views, i.e. the gadgets, and to arrange them in the screen in her desired configuration. These configurations are user-specific. In other words, each user has her own and personalized interface to access the data. The mashup platform is flexible enough to allow users to create and deploy new gadgets that can extend the user interface beyond its initial boundaries. Moreover the wiring between gadgets permits to keep the different views of the resource synchronized, and to navigate through the Linked Data. Changes in one of the views automatically propagate to the rest of the user interface. For instance, a new selection in a monument listing gadget fires updates through the wiring, which results in new photos and videos being displayed. By splitting the user interfaces into small and autonomous components, this approach allows to assemble a coherent application which is more than the sum of its components.

3 Implementation details

The overall architecture is a client/server one. The client role is played by the gadgets, which are small, specific software artifacts. They are deployed inside

⁵ Note that other mashup platforms could use the term “widgets” for these components.

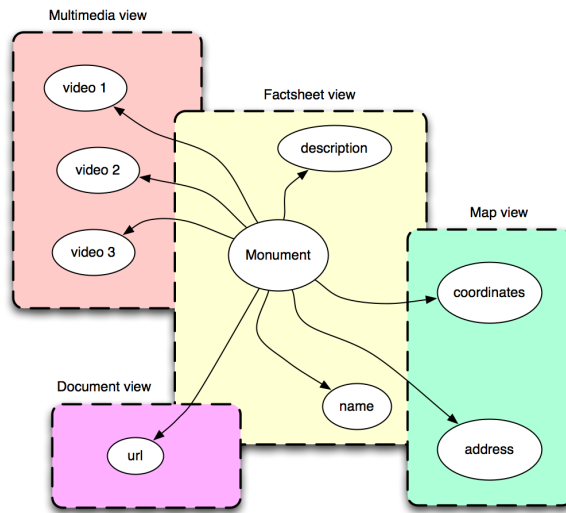


Fig. 1. Different views for the same RDF resource.

the EzWeb platform, which in turn runs within the web browser. Gadgets are described using XML and implemented in JavaScript. XHTML is used to define the user interface. Typically, they have asynchronous communications with the server to improve responsiveness.

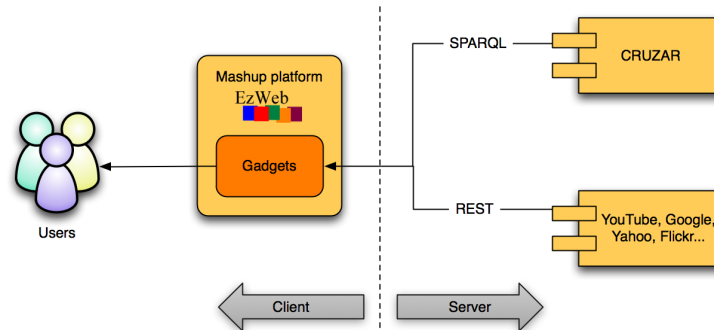


Fig. 2. Mashup architecture.

The server provides the data. In the case of Linked Data, communication between the client and the server is realized using the SPARQL protocol and query language [5, 2]. In order to ease the development of gadgets that query and retrieve the data from a SPARQL endpoint, a JavaScript library, named

ZPARQL⁶, has been created. It is also possible to use non-Linked Data services, such as Flickr (images), YouTube (videos), Google Maps (maps), Yahoo (weather forecast), Wikipedia (document information). In this case, the communication is realized using proprietary APIs which usually rely on REST services.

Figure 2 represents the architecture, where three parts stand out:

- A set of gadgets, deployed in the EzWeb platform.
- Zaragoza's City Council SPARQL endpoint service exposing tourist data. This role is played by the CRUZAR application.
- A bunch of third-party services: YouTube, flickr, Yahoo Weather, Google Maps, etc...

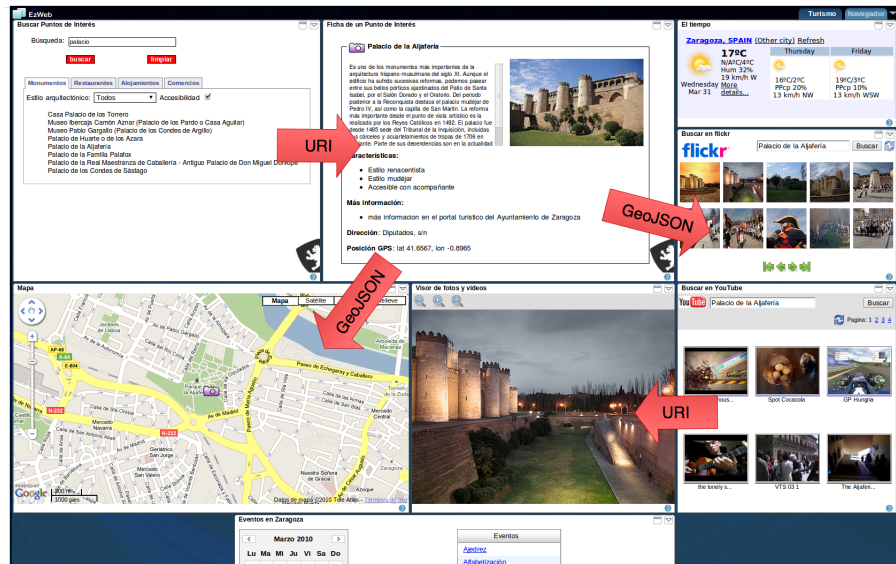


Fig. 3. The eZaragoza mashup.

Regarding the mashup composition of eZaragoza, some gadgets have been specifically created for this mashup, while others have been reused or adapted from the generic catalogue of EzWeb. The wiring among Linked Data gadgets is based on the exchange of URI references. Each gadget manages its own SPARQL communication with the server in order to retrieve the RDF data required for its specific view. RDF data is also transformed into other representation formats such as GeoJSON which are understood by third-party gadgets. The final result is shown in Figure 3.

⁶ <http://forge.morfeo-project.org/wiki/index.php/ZPARQL>

4 Conclusion

The mashup approach has proven useful in order to build end-user applications for exploring rich datasets of Linked Data. Reusability is possible at two complementary layers. Firstly, data can be reused across applications (in our case, CRUZAR and eZaragoza). Secondly, generic user interface components can be reused for different datasets. Money and time can be saved when developing new applications without hampering the quality of the result.

References

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