

# Towards a Open Data based Website for the Zaragoza City Council

**Abstract.** During the last five years, the Zaragoza City Council has been making an important effort in the last three years in order to publish an important amount of information as Open Data. Initially, the geographic information provided by IDEZar was published following the Open Geospatial Consortium standards, and after that a large collection of datasets (most of them as Linked Data). Currently, the next challenge that the institution has in mind is to be not only an open data provider, but to make use of the resources published along the Semantic Web. This paper presents the bases and objectives of the first work to be done by the Council in order to achieve this objective.

**Keywords:** Spatial data Infrastructure, municipal website, city council

## 1 Introduction

City councils are the nearest public administrations that citizens have. The municipal websites are the electronic point that local administrations provide to citizens to access to their services and information. That means that city council websites are the nearest electronic point citizens have to the public administrations services and information. In this way, the success of these sites lies in their capacity for solving citizen's problems and necessities.

Linked Data is presented in the local administration websites mainly through the publication of some datasets of the information managed and generated by the entity. Section "State of the art" reviews several initiatives in the context of the public administration for publishing and consuming Linked Data.

Zaragoza is the capital city of the Zaragoza province and of the autonomous community of Aragon, Spain. It is situated on the banks of the Ebro River, near the centre of the region. It constitutes a crossroads between Madrid, Barcelona, Valencia, Bilbao and Toulouse (France) — all of which are located about 300 kilometres (200 miles) from Zaragoza. The population of the city of Zaragoza in 1 January 2.010 was 699.755, ranking fifth in Spain.

The Zaragoza City Council has its presence in the net since 1994, incorporating information services, communication and transactions. Its evolution is set by the own TIC's evolution as well as for the higher versatility of the mobile services, the increase of the citizen's demand and in concrete, by the fact that the administration should have a key role in the development of the Knowledge Society [1].

The Zaragoza City Council has made an important effort in order to provide citizens with information "just in time" of urban thoroughfares problems and incidences trough the city council website (see

<http://www.zaragoza.es/ciudad/viapublica/movilidad/trafico/trafico.htm> for instance). More of this information is offered under Open Data approach, and in many cases published as Linked Data (<http://www.zaragoza.es/ciudad/risp/presentacion.htm>). This information is always provided over geographic references and maps by using the services provided by the Zaragoza City Council Spatial Data Infrastructure (IDEZar: <http://idezar.zaragoza.es>, [2]).

IDEZar is an initiative of the Zaragoza City Council for building internal (police department, fire department, emergencies ...) and external (mainly for the citizens and tourism) services around their geographic characteristics. From a technological point of view, the base of IDEZar is international standards, mainly Open Geospatial Consortium (OGC, <http://www.opengeospatial.org>) standards. The main points of this approach are:

- the geographic component provides users with an easier to understand visualization of the information,
- The geographic component provides a reference point for joining different contexts information.

Over IDEZar, a big set of functionality is being created day by day. This functionality ranges from the on-line street map to very special services for citizen participation, such as EasyWeb Zaragoza (<http://www.zaragoza.es/ciudad/aprovecha/easyweb/>).

"Open Data" (<http://datos.zaragoza.es>) is a portal that aims to comply with the Spanish Law 37/2007 on reuse of public sector information which aims to promote the provision of documents of public interest electronic means. This website encourages the development of new applications that make use of the information provided by the City Council. The main objective is to facilitate the maximum exploitation of the resources created by the entity. In addition, this portal includes a section on tools and developments that have utility based on data from Zaragoza. This section provides examples that can be referenced by others to create their own solutions. Developers can report on their creations in order to make publicity and public recognition.

This paper presents the current developing line that the Zaragoza City Council is opening for creating an added value web site based on the integration of the current open data published by the institution with other open data external resources. The rest of the paper is structured as follows. Section 2 presents a review of the state of the art. Following, section 3 has its focus in the explanation of the Zaragoza Open data Project. After this, the bases of the working line in progress in the Council are presented. Finally, the paper ends with a conclusion section.

## 2 State of the art

For reviewing the state of the art in consuming Linked Data by local-level public administrations, we are going to use the five-star deployment scheme for Linked Open Data suggested by Tim Berners-Lee especially for government data owners (<http://www.w3.org/DesignIssues/LinkedData.html>):

- **1 Star** - Available on the web (whatever format), but with an open license

- **2 Stars** - Available as machine-readable structured data (e.g. excel instead of image scan of a table)
- **3 Stars** - as (2) plus non-proprietary format (e.g. CSV instead of excel)
- **4 Stars** - All the above plus: use open standards from W3C (RDF and SPARQL) to identify things, so that people can point at your stuff
- **5 Stars** - All the above, plus: link your data to other people's data to provide context

Currently, there are open-data official initiatives in different countries at level 3, but only a few provide RDF. A case apart is UK where data.gov.uk provides the data as linked data through at least one SPARQL node.

There are a lot of local initiatives at level 3. San Francisco (<http://www.datasf.org>), New York (<http://www.nyc.gov/html/datamine/html/home/home.shtml>), Vancouver (<http://data.vancouver.ca>) and Paris are four big-cities examples. In many cases, these level-3 initiatives are related with how city councils expend the citizen's money. This gives rise to the development of websites that make analysis of the data published (i.e. [usaspending.gov](http://usaspending.gov), [wheredoesmymoneygo.org](http://wheredoesmymoneygo.org)). A relevant one is <http://openlylocal.com/councils/open>. It provides the number of level-3 websites in UK: from 434 municipality websites analyzed, only 62 have level-3.

In some cases, these initiatives for open-data publication are accompanied by a competition for the creation of data consumption applications (New York, Amsterdam, Rennes), but not necessary LD.

We have found few solutions explicitly based in Linked Data:

- Local Government Spend Explorer (real data, prototype Unit4). <http://linked4.org>. Data from an English city council.
- Amsterdam- <http://data.brandweeraa.nl> Fire department Amsterdam-Amstelland will publish as much of its data about incidents and fire safety through the linked open data initiative from this site.
- Council spending Linked Data pilot (<http://doc.spending.esd.org.uk/Spending/Default.aspx>) publishes contracts and payments information online.
- Open Election Data that helps to open up local election results in the UK (<http://openelectiondata.org/>).

There are also pilot projects such as the one presented in [3]. It presents a pilot project for the Trento regional tax agency (1 million people, 200 municipalities), databases integrated Registry Office, water Cadastre, electric cadastre, urban cadastre, property tax registry, Geonames; data 2004 to 2008. Task done: (a) integration (b) retrieval using Semantic Web.

In general, although there are a lot of level-3 websites, levels 4 & 5 usually are in an experimental state. New products oriented to the public administration market that offer "Linked Data" are being introduced by companies like iSOCO or Talis

None of the systems and tools found works with geoinformation or by an approximation based on Geo Linked Data.

### **3 The Zaragoza Open Data Project**

Since 1994 the City Council of Zaragoza has an Internet presence through the Internet address [www.zaragoza.es](http://www.zaragoza.es). Zaragoza.es currently comprises 58 thematic portals that contain over 10,000 static pages and more than 40 Web applications. Trying to connect its Internet presence with the new Web realities, the Concyll launched the Zaragoza Open Data Project.

The Zaragoza Open Data Project has as main objective the real openness of the data owned by the institution. This will encourage the reuse of information by citizens, businesses and other organizations, providing increased transparency management, increased citizen participation and the possibility of economic growth in various sectors. To do this, the Zaragoza City Council gateway has created a Web site (<http://datos.zaragoza.es/>) that offers the following services:

- Data catalogue. Includes data sets (published on the website), sorted by topic, labels or "tags" and representation formats. The officers re-users can search based on your preferences. It seeks to provide any public information in as many formats as possible, always looking for open formats not to limit the use. This catalogue also includes data sets formatted as "Linked Data".
- As a technical extension of the data catalogue, a SparQL access point has been incorporated.
- Best practices.
- Formats: Section dedicated to the Formats Used, where brief descriptions of the formats used in the data catalog are presented (<http://www.zaragoza.es/ciudad/risp/formatos.htm>).
- Public Consultation: This consultation is a forum for citizenship, which has encouraged dialogue and participation of any interested party on issues. This forum was opened in <http://consultadatos.zaragoza.es> on July 8, 2010, being presented by a press that had great impact on citizens. This section is structured into two different forums: Data that citizens would like to reuse; and Applications that citizens would like to have available. The results of both forums are being published in <http://www.zaragoza.es/ciudad/risp/consulta.htm>.

The next step proposed know by the Zaragoza City Council is to improve the use of these resources, and to change the approximation used for its web systems development in order to incorporate resources published across the Semantic Web related with the City. Next section presents the objectives of this new approach.

### **4 Objectives y a nearest future**

Till now, the Zaragoza City Council website has been a great provider of open data in general, and Linked Data in particular. The main objective of the current working line is to increase the level of the functionality and services offered by this portal to the citizens by linking the current information to other semantic information sources.

This will be done using Linked Data as the paradigm for the linkage process, and over services developed under IDEZar.

Currently, the Council does not try to link the whole of the Internet presence of the institution to the Semantic Web. It would be an extremely hard work that should be redone every time the web changed. The working line presented in this paper has to be the base for changing the philosophy applied in application and contents generation in the context of the Zaragoza City Council Internet presence. In this way, the main objective exposed before will be break down into the following sub-objectives:

- **Data completeness:** currently, the Zaragoza council is exposing a lot of data as Linked Data. Nevertheless, it is necessary to complete this exposing by including some base data sources that will conform the core of the information published using the Linked Data approach. To obtain the characterization of this core and to link data sources not yet linked are objectives of this working line. In the other side, it will be necessary to find external sources to be used during the linkage activities developed by the content managers.
- **Day-by-day change:** at this moment, information creators in the Council are making their day-by-day work applying some procedures and using a set of selected tools. This working line has as objective the redefinition of these procedures in order to include the linkage of the information on them, and to incorporate a set of tools that make the implementation of these redefined-procedures viable in a production context. To achieve this objective, it would be necessary to provide intuitive tools for publishing Linking Data by civil servants.
- **Teach the steps into linked open data.** This mean to help civil workers to open up their data silos turning the current HTML-based interfaces into linked open data. This sub-objective is focused on creators, software technicians, managers and citizens that play the roles of providers and consumers of local council data. This objective will imply the development of teaching material, tutorials and software that should be simple enough that users can use it to open up their data. These resources will be included in the Web portal as learning material not only for council members and citizens but also for the local Linked Open Data community.

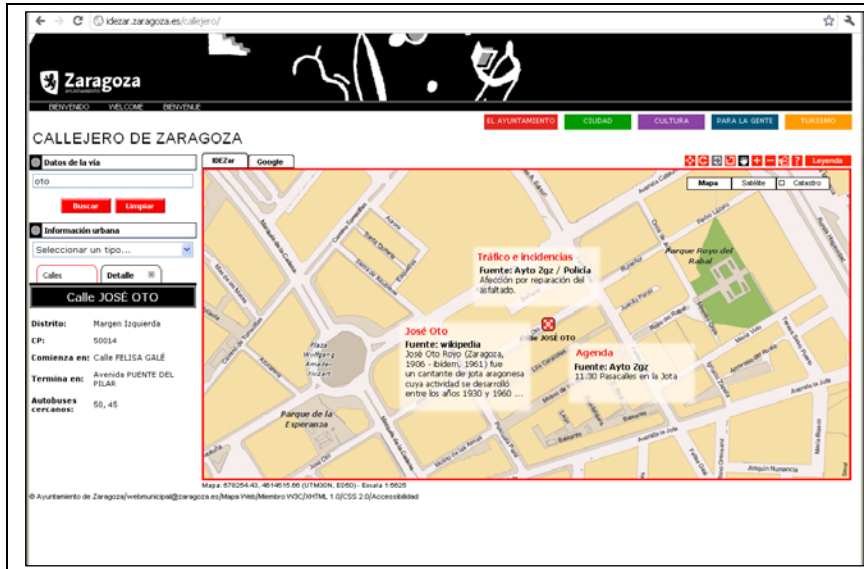


Fig. 1. Linked Zaragoza street map.

The basic functionality that the Council wants to develop is that many of the information published in the council websites can be linked easily to external sources in order to offer the citizens with better resources.

Let's see how the system is going to be built. The main element is a map that works as a browser for geolocalized linked data resources. This map is able to show geocoded Linked Data resources published by the council.

For instance, Fig. 1 shows the location of the *José Oto* Street, which is available as a Linked Data resource. This resource is linked to other resources, such as the *dbpedia*, in order to offer information about who was José Oto. All this information is shown in the map as pins and information boxes that contain summaries of the Linked Data resources and links to them. If the Linked Data resource is known to be derived from other resource (e.g. *dbpedia* is derived *Wikipedia*), the system can use that resource to provide a better human readable description of the resource (see Fig. 2)

In addition to “static” resources, the street map information shows ongoing events such as the traffic and other street incidents information (“*Tráfico e Incidencias*”) and the agenda of the events in the city (“*Agenda*”). This information is published as Linked Data by the council and has a temporal nature. Hence, the map only shows the current and planned events.

The resources published by the council as Linked Open data are not intended for direct human consumption. They are published to be consumed mainly by web applications, such as the map client described above. Nevertheless, the dereference as HTML provides a simple web representation (see the example presented in Fig. 2 a Pubby interface for the agenda of the events) that could help third party developers interested in building something over the infrastructure created by the council.

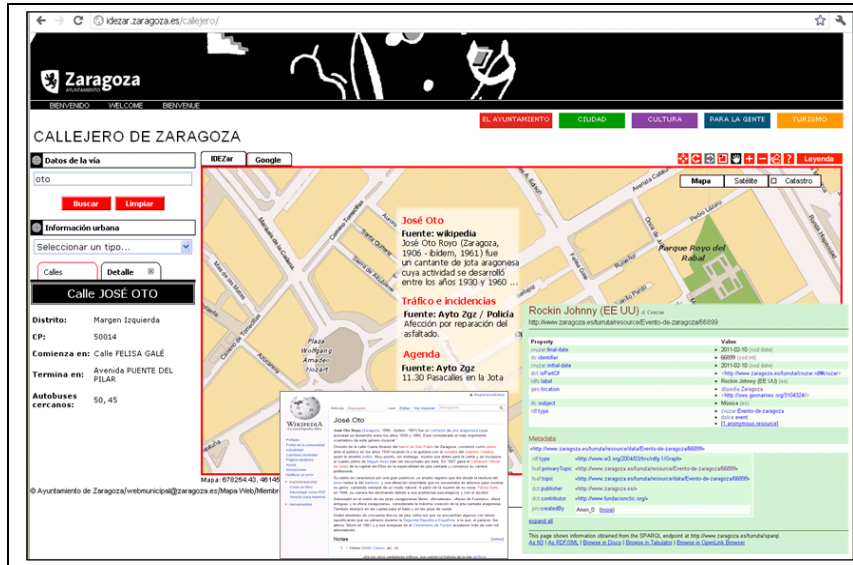


Fig. 2. Accessing to the presentation of the external information results.

## 5 Conclusions

The Zaragoza City Council has been making an important effort in the last five years in order to publish an important amount of information as Open Data (most of them as Linked Data). Currently, the next challenger that the institution has in mind is to be not only an open data provider, but to make use of the resources published along the Semantic Web.

This paper has presented the bases and objectives of the first work to be done by the Council in order to achieve the objective mentioned before. More than one job with high technical content, this paper has tried to be a statement of intent that will enable a future presentation of the accomplishments achieved over time. The current economic situation of the institution makes very complicated to have a good progress velocity in this working line. Nevertheless, the Council is looking for funds in other institutions (European Union mainly) that allows the launching of the working line in an attempt to achieve the basis for achieving the first results that will allow to generate new dynamics and tendencies inside the Institution.

## References

1. [Fernández Ruiz & Morlán Plo 2009] M.J. Fernández Ruiz, V. Morlán Plo, The Zaragoza City Council Website: a Citizen Assistance Service upgrade UPGRADE Volume: 2009,

Issue 1. February 2009 <http://www.cepis.org/upgrade/files/issue%20I-2009-fernandezruiz.pdf>

2. [Portolés-Rodríguez et. al 2005] Portolés-Rodríguez, D.; Álvarez, P.; Béjar, R.; Muro-Medrano, P.R.: "IDEZar: An Example of User Needs, Technological Aspects and the Institutional Framework of a Local SDI". Proceedings of the 11th EC-GI&GIS Workshop: ESDI: Setting the Framework. 2005, P. 56-58.
3. [Fogarolli & Bouquet. 2010] Angela Fogarolli and Paolo Bouquet. 2010. Linking data for public administrations. In Proceedings of the 6th International Conference on Semantic Systems (I-SEMANTICS '10), Adrian Paschke, Nicola Henze, and Tassilo Pellegrini (Eds.). ACM, New York, NY, USA, Article 35, 3 pages. DOI=10.1145/1839707.1839752 <http://doi.acm.org/10.1145/1839707.1839752>.