Case Study: An Intelligent Search Engine for Online Services for Public Administrations

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General Description

The city of Zaragoza offers between 500 and 600 online services to its citizens, organized in about 20 categories, such as tax, building reconstruction, traffic, environment, education, healthcare, etc.

The problem

When a citizen is looking for a particular service, it turns out that it is not particularly easy to find. Many of the city's web sites simply enumerate the available services in a list organized by categories. Other city web sites offer a traditional search engine that retrieves services based on co-occurrence of words in the query and the description of the services. Additionally, the language used by Public Administrations is not always the same as that used by citizens. For instance, when a person wants to throw away an old washing machine, they need to know that the government service is called "Large Things Collection".

The solution

The City of Zaragoza now has a new search engine powered by Semantic Technology that finds online services based on the *meaning* of both the query and the service description. The meaning of services is defined through an ontology for Public Administration, which for instance represents that persons can change address, that car owners need to pay taxes, that certain business may cause disturbance (such as bars and discotheques), and that there are different kinds of reconstruction works each requiring different permits. A snapshot of the ontology can be seen on Figure 1 (in Spanish).

The ontology distinguishes between different kind of agents, events, objects and processes, along with their inter-relations.

Figure 1: Snapshot of the ontology

When a citizen types a query in the search engine, a combination of natural language processing (http://www.bitext.com), and ontological reasoning is used to expand the query (using the *Knowledge Index* software). The same technology is applied to the service descriptions resulting in an enriched index. Services are then retrieved based on standard information retrieval techniques enhanced with an ontological ranking system. A screenshot of the application is shown below.

Figure 2: Screenshot of the application

Key Benefits of Using Semantic Web Technology

For the City of Zaragoza the benefits include

- Providing a better service to its citizens, and thus improving the image of public administration to citizens
- Stimulate e-Government by providing easier access to relevant information
- Reduced cost by lowering the load on the call center and physical offices
- On the way to "citizen self-service": not only information retrieval but also semi-automatic service execution

For citizens the benefits include

- Easy interaction, either through keywords or natural language
- High precision, without loosing recall
- Concrete answers instead of long lists of documents
- Ability to suggest related services (serendipity)
- Perceived as a search engine which "understands" the citizen

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