Chapter 14

GSSP – A Generic Semantic Search Platform: Evolve from a Traditional to a Semantic Search System

Sara Paiva  
Viana do Castelo Polytechnic Institute, Portugal

Manuel Ramos-Cabrera  
Vigo University, Spain

Alberto Gil-Solla  
Vigo University, Spain

ABSTRACT

Semantic search has been rapidly growing as a way to improve search results. The meaning of the input expression has revealed to produce better results than the traditional keyword appearance. Regarding search engines, there are currently several proposals but all of them are already implemented to a specific goal. We find important to develop a generic semantic search system so it rapidly be adapted to any system and domain that has search needs. This work introduces GSSP, a generic semantic search platform proposal. We present the platform and the several steps that need to be followed in order for the platform to be used. We also provide the ongoing work that is being done to apply GSSP to a Quality Management System.

INTRODUCTION

The search for information has been an active line of study for several years now, as its improvement is important for end users so they can find quicker information they are looking for, which means saving time, which can be applied in more productive tasks. Besides getting a quick response, users also want to find exactly what they need which lead us to the searches result objectivity issue.
Quick and objectively finding of information is still a difficult task as search engines have not yet found a way to provide useful results (Kassim & Rahmany, 2009). The issue of how quick the information is delivered to the end user can be addressed with a hardware intervention, creating more and better resources to process data faster for end user delivery. However, when we talk about objectivity we are talking about delivering exactly what the user wants - no more and no less. And to achieve this, it is necessary that search systems are able to understand what the user is saying so they can respond objectively. For this to be possible, resources must have information that can help the search system in the task of obtaining the most relevant ones. For instance in a music search system, each singer resource could have information about the number of sold records, the music gender or the singer’s full name. These attributes can help searches to become more objective.

When we add information to resources in order to improve the search process, the conventional search gives place to a semantic search, characterized by meaning-based approach (Tümer, Shah, & Bitirim, 2009). The Web 3.0 proposes to clarify the meaning of resources through metadata annotation – data over data. Based on this association, searches become semantic and consequently more powerful than traditional searches. Google is probably the most widely used traditional search engine these days. And this is due to the search algorithms used and the results quality it returns to our queries. But this is not true to all types of searches. If we want to see information related to cloud computing and we use as search input the expression “Cloud Computing”, a good subset of results is returned such as Wikipedia entries, articles in blogs/magazines or YouTube videos. In this case, we are not looking for anything in particular, but broad general information about a given theme. On the other side, a user might want to know the books written by a specific author, such as Stephen Hawking, and Google is not yet able (as any other search system) to provide us with this kind of objectivity. There are currently several proposals in literature regarding the possible architecture of a semantic search engine (Kassim & Rahmany, 2009), (Wang & Beijing, 2010). These proposals focus on the description of the components that should exist on search systems, such as ontologies, web crawlers, inference engines, etc. In this paper, we address a slightly different issue that has to do with the ability to evolve from a traditional search system to a semantic system. We present GSSP - a Generic Semantic Search Platform, based on the predecessor PRECISION (S. Paiva, Ramos-Cabrer, Gil-Solla, Fernandez-Vilas, & Diaz-Redondo, 2011), which at this point is optimized for documental searches. GSSP was designed to suite any scenario where searches are helpful and with few configuration needs. GSSP intends to be easy, not only to the end user, but also for the system that is trying to adopt it to its use. In this case, the only intervention is the definition of the concepts to search and the data insertion itself. Everything else is generic to GSSP and adaptable to any system. The rest of this paper is organized as follows: the next chapter presents a related literature review. Next we present GSSP with subsections starting with an overview of the system, the architecture and then the detailed explanation of the four stages for its use in a specific domain: concept definition, data insertion, data expansion and searches. Before the conclusions, we present an on-going application of GSSP to a Quality Management System in a Public High Education Institution.

LITERATURE REVIEW

When reviewing the literature before introducing GSSP, several aspects need to be addressed. First and most important, the need for a generic system emerges as we didn’t find in the literature review any