SEARCHING ON THE SEMANTIC WEB

One of the areas which benefits most significantly from the application of semantic technologies is Web search. In traditional search engines, the sole subject of a search operation were strings of characters. This meant that computers had no additional information that would help in finding relevant results and aspects crucial to human understanding of language, such as the context of a given term had no impact on search processes. With its paradigm of meaningful data, the Semantic Web offers entirely new perspectives on searching across data.

One example that vividly presents what benefits spring from introduction of semantic mechanisms is as follows. Imagine you are looking for a pharmacy that is open on Sunday until 8 o'clock and is located within the perimeter of 2 kilometres of your location. You have different options, but at present, none of them offers a quick way to achieve this goal. You may access map sites and try to find pharmacies manually. This is however a cumbersome process, because you need to search the map's database and access each returned result to see if it matches the attributes you are looking for. Moreover, every pharmacy has a different website, with different structure and different scope of information, demanding to scan each one for the same pieces of information. The other option would be to use a search engine. However, typing "pharmacy open on Sunday until 8pm within 2 kilometres from my location" will give mostly irrelevant results, precisely because what search engines do, is looking for strings of characters. For these mechanisms, the only relation between the terms "open" or "pharmacy" is the relation of strings of characters in the query and those appearing across the Internet.

In a semantic search engine however, the sought after entity is not merely a group of letters arranged in a specific way. A "pharmacy" will have specific properties. It is a class of entities which have several attributes such as: opening hours, location, days of operation, brand and many more. The search engine will then "understand" that "open on" relates to opening time and that "within 2 kilometres" is a distance of the provided location calculated on basis of the location of the pharmacy. All these things are inferred in real time and are not based on fixed, prewritten information. The engine no longer looks for mere letters, but scans across the class of pharmacies and checks which entities belonging to it satisfy the provided conditions. This provides precise, transparent results for a question which is actually based in natural language we use every day. Computer and internet technologies provide

incredible capabilities; yet giving an answer to such a simple sentence is still impossible. Semantic web will change that.

The above mentioned example is obviously a very simple one, but we may easily imagine what extent of opportunities would spring from real-time reasoning on much greater scale. Portals such as Wikipedia would be able to provide direct answers to complex questions, instead of referring to entire sites, leaving the visitor with the task. Various branches of business, such as the automobile industry, where millions of different objects and combinations of objects are dealt with could obtain a tool that creates syntheses of any portion of data, however scattered or belonging to different sources. Scientific knowledge could be organized and analysed on basis of any logical operations.

The opportunities are immense and **already today a growing number of industries, research operations and commercial enterprises are implementing semantic technologies.**