Chapter 12
A Semiotic-Based Approach for Search in Social Network Services

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ABSTRACT
Search mechanisms in Social Network Services (SNSs) should take into account the meanings created, shared, and used by people through the use of the system. This paper investigates a new approach to develop search mechanisms more adequate for SNSs. SNSs represent an opportunity for people access to information in the Web. These systems allow individuals to constitute communities of common interests with wide cultural diversity, sharing information and vocabularies. The search mechanism proposed in this paper is grounded in Semantic Web technologies combined and articulated with Organizational Semiotics methods and artifacts. The authors illustrate a process to create the ontology and techniques to improve semantic search results in SNSs using Semantic Web Rule Language. The paper discusses the practical and technological results that could be achieved using the proposed approach.

INTRODUCTION
The advent of the Web and more recently the appearance of the Social Web have brought new opportunities for knowledge access and sharing. Social Network Services (SNSs), Wikis and Blogs are examples of Social Web applications that allow an intensive interaction between users, generating a huge amount of information. More important than information quantity, is their quality and relevance to the user. Usually the process of find-
ing and using the digital content in these systems depends on the search mechanism. According to Jamali and Abolhassani (2006), SNSs connect a set of entities via social relationships and facilitate the information exchange. There has been a rapid increase in the number of users signing up and actively using Social Networking Websites such as Facebook, Flickr, Orkut, MySpace, etc. (Gürsel & Sen, 2009). However, the current search solutions for SNSs are typically generic, impersonal and built primarily through comparisons of keywords with lexical-syntactical information processing (syntactic search). Due to the popularity of the SNSs, with their acceptance and innovative use, the improvement of search results will have a significant impact on the level of satisfaction in the use of these services.

Literature has shown different approaches to improve search mechanisms, but it still lacks a solution that takes into account the users’ language. We argue that to improve search results it is necessary to consider the influence of users’ daily and ordinary language with their meanings established by the use of the system. Reis et al. (2010) pointed out that semantic can make difference for the non-expert users, and users’ local/colloquial meaning should be considered during the development of more appropriate search engines. Thus, there is a demand for search mechanisms which consider the users’ colloquial language variety. A more suitable search solution for SNS should reflect the semantic used by the participants of the system. Therefore, it is necessary to identify the meanings, and to represent the semantic aspects with appropriate methods to be used by the search mechanism.

In this paper we improve and detail the ideas originally described by Reis et al. (2010) to develop a search solution which draws upon Organizational Semiotics (OS) (Stamper et al., 2000; Liu, 2000; Stamper, 2000). Our goal is to expand the representational structure techniques from the Semantic Web (SW) field, by including associations among the meanings of the concepts with users that consume and produce them in a SNS. For that, we have proposed a method for the design of Web ontologies (WOs) that includes those associations. The produced ontology was named “Semiotic Web ontology” (SWO) (Reis et al., 2010b). We present a semi-automatic process to build Web Ontology Language (OWL) (W3C, 2004) ontology from the SNS data, supported by this method. Moreover, we elucidate and propose new search strategies using this approach, illustrating and discussing the practical and technological results that can be reached.

The paper is organized as follows: the next section introduces the theoretical and methodological background; after that, we detail our proposal showing the results and exemplifications; the following section makes a discussion evaluating also the related works; and finally, the last section draws conclusions and recommendations for further work.

THEORETICAL AND METHODOLOGICAL BACKGROUND

This section presents a brief overview of the OS as a theoretical background to this work. A review of concepts from Semantic Analysis Method (SAM) is also presented in order to clarify our proposal.

Organizational Semiotics

Semiotics (Hartsthorne, Weiss, & Burke, 1998), the ancient doctrine of signs, leads us to a precise understanding of information as various properties of signs. Signs are simple entities easy to deal within the inter-subjective domain. Anything standing for another thing or used to signify something is an example of sign: words, traffic lights, diagrams, a wave of hand or a facial expression. From a Semiotic point of view, people communicate in SNSs by sharing signs, and such signs are socially constructed and shared over interaction. In this sense, we have to understand the signs and
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