

## Chapter 9

# Social Networks and Semantics

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### ABSTRACT

*This chapter discusses the relation between Social Networks and Semantics – two areas that have recently gained a lot of attention from both academia and industry. The authors show how synergies between these two areas can be used to solve concrete problems, and they describe three approaches that demonstrate the potential for interconnecting these technologies. The first approach focuses on the semantic profiling of social networks. More precisely, they study the characteristics of large online social networks through an extensive analysis of over 1.9 million MySpace profiles in an effort to understand who is using these networks and how they are being used. The MySpace study is based on a comparative analysis of three distinct but related facets: the sociability of users in MySpace; the demographic characteristics of MySpace users; and the text artifacts of MySpace users. The second approach to interconnecting social networks and semantics focuses on a solution for mediating between social tagging systems. The Upper Tag Ontology (UTO) is proposed to integrate social tagging data by mediating between related social metadata schemes. The chapter discusses how UTO data can be linked with other social metadata (e.g., FOAF, DC, SIOC, SKOS), how to crawl and cluster tag data from major social tagging systems, and how to integrate data using UTO. The third approach discusses the use of social semantics to qualitatively improve the task of service ranking. The authors explore the idea of using social annotation technolo-*

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*gies for ranking web services and show how such an approach can be implemented using information provided by Delicious, one of the largest social networks.*

## 1. INTRODUCTION

Online communities are the fastest growing phenomenon on the Web, enabling millions of users to discover and explore community-based knowledge spaces and to engage in new modes of social interaction. Web 2.0 sites such as Facebook<sup>1</sup>, MySpace<sup>2</sup>, Delicious<sup>3</sup>, YouTube<sup>4</sup>, Yahoo! Answers<sup>5</sup>, and LinkedIn<sup>6</sup> have grown tremendously in the past few years, garnering increased media and popular attention. The result of this increased awareness is that the Web is socially linked more strongly now than ever before.

Generally speaking, Web 2.0 technologies are transforming the Web environment from a simple repository for documents into the Social Web, a communal platform for connecting people and sharing information. The phrase *Social Web* was introduced in 1998 by Peter Hoschka (1998), who wanted to stress the social functions and capabilities of the Web medium. According to Wikipedia, the Social Web is a global and open distributed data sharing network that links people, organizations and concepts. The Web 2.0 environment is the venue for the Social Web and provides platforms and technologies (e.g., wikis, blogs, tags, RSS feeds, etc.) that facilitate online collaboration and communication. Online social networking is part of the Web2.0 being defined according to Wikipedia as having a core focus on building and reflecting of social networks and social relations among who share interests and/or activities.

Online publishing in the Web 2.0 environment has become so easy that anyone who can write or type can publish on the Web. This revolution has stimulated an ever-growing number of ordinary users, many of them teenagers or seniors, to become involved in Web communication. One of the newest and easiest ways for these users to contribute to

the Social Web is through the process of tagging. Tagging is a means for users to add keywords to resources as typed hyperlinks and, cumulatively, reflects community efforts to organize and share information resources. The growing popularity of tagging is furthering the evolution of the Web from a simple repository for hyperlinked documents to a typed hyperlinked Web of data.

As online social networks continue to grow and evolve, an important challenge we face is how to maintain the incredible success of Web 2.0. There is a growing need to understand this new social phenomenon; to understand the processes by which communities come together, attract new members, and develop over time; and to understand what it takes to empower online communities with the ability to gather and retain a core of actively participating members (Backstrom et al., 2006; Coleman, 1990).

Another challenge that we are facing is the increasing heterogeneity and growing amount of data, numbers of resources and users on the Web. Data mediation and data integration have been central concerns of IT for decades (Batini, Lenzerini & Navathe, 1986; Rahm & Bernstein, 2001). With the advent of the Web, interest in these issues has exploded. Currently, there is a focus on providing machine supported mediation on the Web (Antoniou & Harmelen, 2004; Berners-Lee, Hendler & Lassila, 2001) through the medium of machine-processable metadata that has been added to resources. In this context semantics, more particular Semantic Web (Berners-Lee, Hendler & Lassila, 2001), could enable machine supported mediation on a large scale. Using semantics, information becomes machine processable making possible for agents to understand and fulfill users requests.

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