Chapter 1.26
Social Semantic Web and Semantic Web Services

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ABSTRACT

In this chapter the authors aim to portray the social aspects of the World Wide Web and the current and emerging trends in "Social Web". The Social Web (or Web 2.0) is the term that is used frequently to characterize Web sites that feature user provided content as their primary data source and leverage the creation of online communities based on shared interests or other socially driven criteria. The need for adding more meaning and semantics to these social Web sites has been identified and to this end the Semantic Web initiative is described and its methodologies, standards, and architecture are examined in the context of the "Semantic Social Web". Finally the embellishment of Web Services with semantic annotations and semantic discovery functionality is described and the relevant technologies are explored.

INTRODUCTION

The World Wide Web (WWW or, simply, the "Web") has been used extensively as a huge network of interconnected islands of data where documents are linked, searched for, and shared, forming a massive, albeit not always well organized, digital library. Sharing of digital content has always been the major requirement for the Web since its inception and will continue to be one of its most important features in the years to come. Nevertheless, what we experience nowadays is the endeavor for extending this sharing to cover also additional artifacts beyond plain documents, like data, information, and knowledge. The power of the hyperlinks, connecting different, possibly disparate entities, can also be exploited in order to connect information sources and people: not just "dumb" machine readable data but dynamic content like user profiles and ultimately people themselves for building virtual communities. The vision is that the current web of computers and documents will be broadened to the web of people. A "People Web" is the one where users are the nodes of the graph, the edges being their relationships and interactions in space and time, thus constructing new virtual societies (see Figure 1).

This new environment is leveraged by the introduction of an array of technologies collectively identified as Semantic Web (Berners-Lee, Hendler, & Lassila, 2001). The Semantic Web builds upon the existing Web and provides the necessary sub-

Figure 1. A social graph
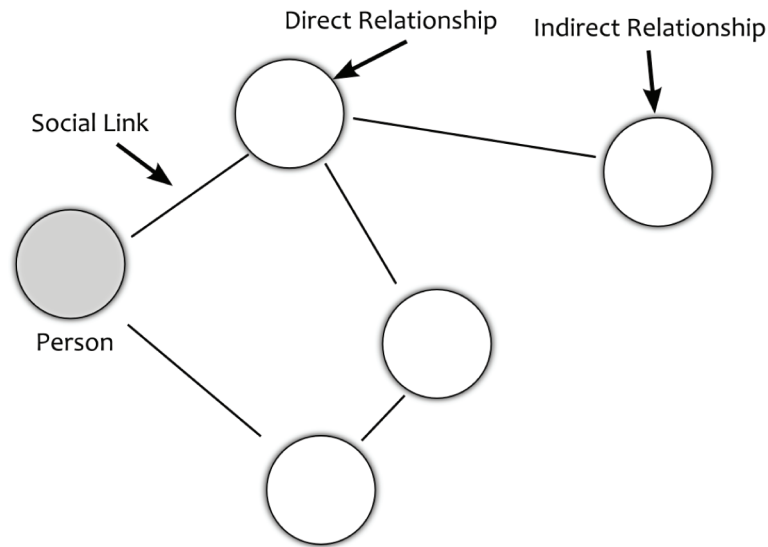
strate for giving "meaning" and "Semantics" to Web resources and Web interactions. The benefits will be many in a number of application domains and while the challenges, technological and other, are numerous, the momentum is strong and the Semantic Web slowly but steadily enters in a number of diverse domains like health and life sciences.

Furthermore the Semantic Web promises a great potential for supporting the construction and smooth operation of Web communities of people. In this chapter we study its fusion with social software and software for machine to machine communication over the Web for supporting this vision.

BACKGROUND

Since its launching in 1990, the Web has grown exponentially both in terms of size and in terms of use and utility to people and organizations. The inherent simplicity of hypertext and its feature limited, in comparison to previous hyper linking systems, one-way, inexpensive links (Universal

Resource Identifiers – URIs) but also the employment of the Internet as its networking substrate led to its wide adoption and success.

In spite of its success and popularity the early version of the Web lacked in many respects, ranging from user accessibility and user interface design to the ability to repurpose and remix existing Web-based data in not pre-established ways. Although the hyper linking facility allowed the interconnection of different documents on the Web, the "traditional" Web suffers from fragmentation in the sense that the huge graph lacks any organization and discipline. This "anarchy" in the Web has also been its driving force for the success it has enjoyed so far but created the need for having special machinery, e.g. search engines like Google, to deal with the efficient indexing and discovery of the available information. Despite the fact that the search engine technology has made important steps in indexing and searching massive amounts of data on the Web, there's still the issue that keyword based searching is limited on its potential and usually finding "what the user wants" proves to be a tedious task. Another major limitation of this environment is that the people

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