

Chapter 6

Social Web Services Management

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ABSTRACT

As part of our ongoing work on social-intensive Web services, also referred to as social Web services, different types of networks that connect them together are developed. These networks include collaboration, substitution, and competition, and permit the addressing of specific issues related to Web service use such as composition, discovery, and high-availability. “Social” is embraced because of the similarities of situations that Web services run into at run time with situations that people experience daily. Indeed, Web services compete, collaborate, and substitute. This is typical to what people do. This chapter sheds light on some criteria that support Web service selection of a certain network to sign up over another. These criteria are driven by the security means that each network deploys to ensure the safety and privacy of its members from potential attacks. When a Web service signs up in a network, it becomes exposed to both the authority of the network and the existing members in the network as well. These two can check and alter the Web service’s credentials, which may jeopardize its reputation and correctness levels.

INTRODUCTION

As part of our ongoing research work on blending social computing with service-oriented computing we developed three types of social networks having Web services as members (Maamar et al., 2011a). These networks address specific issues related to

composition of Web services namely discovery and high-availability. The development of these networks is strictly dependent on the functionalities that Web services offer. checkWeatherForecast and convertExchangeRate are examples of functionalities. We refer to these networks as collaboration, substitution, and competition. In a collaboration

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network, the functionalities of Web services are different and sometimes complement each other, e.g., checkWeatherForecast and bookOutdoorVenue. Contrarily, in substitution and competition networks the functionalities are semantically similar, e.g., bookTrainSeat and reserveTrainTicket. There exist different techniques and approaches to compare Web services' functionalities in term of either difference or similarity (Di Martino, 2009), but this is outside this chapter's scope.

Compared to (regular) Web services, social Web services establish and maintain networks of contacts; count on their (privileged) contacts when needed; form with other peers strong and long lasting collaborative social groups; and, know with whom to partner so that ontology reconciliation is minimized (Maamar et al., 2011a; Maamar et al., 2011b; Maamar et al., 2011d). Collaboration, substitution, and competition networks support a social Web service, respectively, recommend the peers that it likes to work with in the case of composition, recommend the peers that can substitute for it in the case of failure, and be aware of the peers that compete against it in the case of selection.

Like persons who sign up in social networks (e.g., Facebook and Linked) after assessing criteria such as services offered, reputation, and reliability, we advocate that Web services should do the same. Indeed when a social Web service joins a network, it becomes exposed to the authority responsible for managing the network and also the existing members in the network. Both can check its credentials with the risk of altering them, which may jeopardize its reputation and correctness levels. This risk could be tackled subject to setting up appropriate means. For this purpose we define *privacy*, *trust*, *fairness*, and, *traceability* criteria that back the sign-up decision of a Web service in a network. To identify these criteria we look at how existing Web-based social networks such as Facebook and LinkedIn "control" the exposure of their members' profiles through a list of rights and responsibilities. We define similar rights and

responsibilities in response to the particular needs, requirements, and characteristics of Web services.

After a brief overview of social Web services the next sections of the chapter introduce the criteria that assess the quality-of-service of social networks, the policies for managing these networks, the relationships between these criteria and policies, and last but not least the commitments that enforce the compliance with these policies. A set of future research directions are listed and then concluding remarks are drawn.

SOCIAL WEB SERVICES

Social Web services are at the cross-road of two main disciplines: social computing (exemplified by Web 2.0) and service-oriented computing (exemplified by Web services). Existing research work either adopts Web services to assist in developing social networks of users or develops social networks of Web services to address certain issues such as Web services discovery. In this chapter the focus is on the latter type of social networks.

In the first category of social networks of users, we cite the following works. Maaradji et al. propose a social composer that advises users on the next actions they can take in response to events such as Web services selection (Maaradji et al., 2010). Xie et al. (2008) introduce a framework for semantic service composition based on social networks. Wu et al. rank Web services using non-functional properties and invocation requests at run-time (Wu et al., 2009). A Web service's popularity as analyzed by users is the social element that is considered during the ranking. Last but not least, Nam Ko et al. discuss the social Web in which "social-networks connect services" help third-party in developing social applications without having to build social networks (Nam Ko et al., 2010).

In the second category of social networks of Web services, we cite our works by Maamar et al. (2011c, 2011e). In the first work we suggest a

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