Chapter 11
Social Web Services
Research Roadmap: Present and Future

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ABSTRACT
There is a growing interest in the research and industry communities to examine the possible weaving of social elements into Web services-based applications. This interest is backed by the widespread adoption of Web 2.0 technologies and tools developed using various online means such as social networks and blogs. Social Web services incorporate the result of this weaving and are concerned with establishing relationships with their peers like people do daily. This chapter reviews the recent developments in this new topic and identifies new research opportunities and directions that are still unexplored such as security, engineering, reputation, trust, and argumentation.

INTRODUCTION
Web services are among the latest information and communication technologies that people hail for their role in making business processes cross organization boundaries transparently and efficiently. A Web service presents the following properties (Benatallah et al., 2003): independent as much as possible from specific platforms and computing paradigms; primarily developed for inter-organizational situations; and easily composable so that developing complex adapters for the needs of composition is not required. Composition is one of Web services’ selling points; it aims at
putting several Web services together in response to complex users’ requests.

Despite Web services widespread adoption, they have fallen short of their potential as reported in (Maamar et al., 2011a). Web services are isolated: they know about themselves only; they are not aware of the presence of other peers; they cannot reconcile ontologies among each other or with their users; they cannot delegate their invocation requests to other peers when unavailable; they do not instantaneously and voluntarily cooperate with each other or self-organize; limit users’ intervention considerably and function as black boxes; and, last but not least, consider only their own internal functional and non-functional details during execution and ignore other external details, such as user past interactions. These limitations simply undermine the capacities of Web services in helping organizations face today’s challenges such as agility, competitiveness, and transparency. In this chapter we review some initiatives that inject social elements into Web services operation as an innovative way to address Web services’ limitations. These social elements are present in people’s daily life like friendship, fairness, and trustworthiness and can be applied to Web services when they engage in compositions. The result of this weaving is referred to as Social Web Services (SWSs) (Maamar et al., 2011a, Maamar et al., 2011b, Maamar et al., 2011c). SWSs are now in a position to establish and maintain networks of contacts; count on their (privileged) contacts when needed; form with other peers strong and long lasting collaborative groups; and, know with whom to partner so that ontology reconciliation is minimized.

SWSs are built upon the results of merging social computing with service-oriented computing. On the one hand social computing is about collective action, content sharing, and information dissemination at large. On the other hand, service-oriented computing is about service offer and request, loose coupling, and cross-organization flow. To support SWSs “know” with whom they transacted in the past and with whom they would like to trade or cooperate in the future, they need to build and maintain their social networks of contacts. Moreover, to empower Web services with social communication capacities, we abstract them as agents that pursue social goals (Bentahar et al., 2007). Different types of networks connecting Web services can be built including collaboration, competition, and substitution. These networks will first, be traversed to identify SWSs’ collaborators, competitors, and substitutes, and second be drilled into to assign qualities to SWSs such as selfishness and trustworthy.

This chapter is organized as follows. The next chapter introduces the motivations behind the topic of social Web services and suggests a literature review on this topic. Afterwards existing research initiatives on social Web services are discussed. Prior to concluding, some future research directions are established.

BACKGROUND

Motivations

A good number of today’s applications integrate social elements such as collaboration and coordination into their operation to reflect the way people operate. These applications capitalize heavily on the Web as a platform for achieving cross-organization interaction and adopt new tools including weblogs, social networks, and wikis to achieve this integration. Among all these tools social networks are those that have attracted the attention of academia and industry communities. Social networks illustrate the willingness of users to share information, work with others, and recommend services and applications. These various, rich, and yet complex forms of interaction illustrate to a certain extent the principle of “I offer services that somebody else may need” and “I require services that somebody else may offer” upon which Web services are built.