A Framework for the Active Credibility Engineering of Web Applications

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ABSTRACT

The issue of credibility is a major concern for the consumers of Web applications in a variety of domains and is crucial for an organization’s reputation. Using a taxonomy of credibility, a systematic approach to one class of credibility, namely the active credibility, of Web applications is considered. To that regard, a viewpoint-oriented framework for the active credibility engineering of Web applications is proposed, and the managerial, societal, and technical viewpoints of it are analyzed in some detail. A few directions for extending the framework are outlined.

Keywords: affect; perception; process model; reputation; semiotic quality; stakeholder; trustworthiness

INTRODUCTION

The Web continues to evolve since its inception, and the Semantic Web (Hendler, Lassila, & Berners-Lee, 2001) and the Social Web (O’Reilly, 2005) are two recent directions commonly pursued. The Semantic Web provides the technological infrastructure for better knowledge representation, interpretation, and reasoning, while the Social Web opens new vistas for interaction, participation, and collaboration. In spite of the significant prospects offered by these advancements and their confluence (Lassila & Hendler, 2007), there are certain caveats.

The trustworthiness of information remains one of the critical constants in the evolution of the Web. The potential for the distribution of inaccurate medical
information from unqualified sources and the presence of implicit advertising of drugs has had an acute impact on the consumer perception of health-related Web applications (Walther, Wang, & Loh, 2004). It has been observed in recent surveys (Consumer Reports Web-Watch, 2005) that uninvited solicitation and misuse of information provided by consumers with little repercussions for the perpetrators is a matter of grave concern. This situation is only exacerbated in the context of a Social Web application whereby some ‘transfer of control,’ a consumer becomes a coproducer or ‘prosumer.’

Indeed, credibility is a necessary condition for trustworthiness of information, and needs to be approached in a systematic and feasible manner to be realizable. The rest of this article is centered on this theme and is organized as follows. First, the background necessary for later discussion and a brief outline of related work is provided. Next, a viewpoint-oriented framework for the active credibility engineering within the context of Web applications is introduced. Then, challenges and directions for future research are outlined. Finally, concluding remarks are given.

BACKGROUND AND RELATED WORK

For the sake of this application, a Web application is a Web site that behaves like an interactive software system specific to a domain. It typically has a large size that requires a nontrivial infrastructure: a systematic development process, a team with a high level of knowledge and skills, deployment of additional software on the client- or server-side, and a schedule comprised of several weeks or months from inception to completion.

Also, for the sake of this article, credibility is considered to be synonymous to (and therefore interchangeable with) believability (Fogg & Tseng, 1999). The prominence–interpretation theory (Fogg, 2003a) provides one explanation of how people attach ‘significance’ with (and therefore perceive the credibility of) a Web application. Furthermore, credibility engineering is defined as the discipline of ensuring that a Web application will be perceived as credible by its stakeholders and doing so throughout the life cycle of the Web application.

The concept of credibility can be classified (Fogg & Tseng, 1999; Kamthan, 2007) based upon the types of consumer interactions with a Web application. A consumer could consider a Web application to be credible based upon direct interaction with the application (active credibility), or consider it to be credible in absence of any direct interaction but based on certain predetermined notions (passive credibility). There can be two types of active credibility, namely surface credibility, which describes how much the consumer believes the Web application based on simple inspection, and experienced credibility, which describes how much the consumer believes the Web application based on firsthand experi-

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