Chapter 20

A Roadmap on Awareness of Others in Accessible Collaborative Rich Internet Applications

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ABSTRACT

Web 2.0 represents a shift from static to highly dynamic, participative, and collaborative Web. However, most of Rich Internet Applications (RIAs) are still not accessible; as a consequence, universal participation is still far from being a reality. Providing accessible means for "awareness of others" (i.e. a perception of the activities of others in the system) is essential in RIAs to enable collaboration among all users. This chapter explores, through a systematic literature review, studies approaching the topic in accessible collaborative RIAs. The authors also identify the technologies proposed, extended, or used by those studies. As results they characterize the studies in the area and clarify the state-of-the-art of technologies for supporting awareness of others. Finally, the authors propose a set of guidelines aiming at supporting the design of mechanisms for awareness of others in collaborative RIAs.

INTRODUCTION

The second wave of websites, also known as Web 2.0 brought significant innovations not only regarding technology, but also on social aspects. In the Web 2.0, aspects such as user participation, collaboration, real-time interaction, awareness of others (*i.e.* an understanding of the activities of others, which provides a context for our own activity (Dourish & Bellotti, 1992) while in a shared interaction space), and social networking are in the spotlight (Gibson, 2008). Also, websites are being gradually extended to Web applications, renamed Rich Internet Applications (RIAs). Such applications are increasingly becoming

more robust and some of them can already rival with desktop applications. Mesbah, van Deursen, & Roest (2012) point out some reasons for the adoption of RIAs: no installation effort on the client-side; everybody using the most recent version; access from anywhere with Internet access (both to applications and user data); new collaboration and community building opportunities.

Interaction spaces in RIAs may be highly dynamic, and content updates may involve responses for user requests and environment updates (*i.e.*, updates automatically triggered by the application). Both types of updates occur without requiring reload of the whole page. The environment updates are especially important in collaborative RIAs (*i.e.*, RIAs in which users collaborate with each other in shared interaction spaces). A significant amount of such updates is concerned with enabling awareness of others' identity, presence, actions, objects, etc.

The novel possibilities enabled by RIAs are essential to support relevant aspects of the Web 2.0 as participation and collaboration. On the other hand, there is an increasing concern on the access to RIAs. RIAs should not only be accessible by every person but also provide equivalent possibilities of participation and collaboration (Mori, Buzzi, Buzzi, Leporini, & Penichet, 2011). Initially focused on people with disabilities and the AT (Assistive Technologies *e.g.*, voice browsers, screen readers) used by them to access computer applications, accessibility may the extended to every person since all of us are different in diverse aspects of life and we are constantly affected by context and temporary constraining situations (*e.g.*, in a noisy environment, a broken arm). Accessibility features are not limited to the User Interface (UI), they can also influence the application architecture and overall features (Jeschke, Vieritz, & Pfeiffer, 2008); however, diverse problems can be solved by providing semantic for elements and relationships among them. In (collaborative) RIAs semantically meaningful elements must also provide information about state changes and dynamic updates in a (shared) interaction space, especially those related to awareness of others.

Since RIAs involve the proposition and extension of web guidelines and standards (*e.g.* HTML5, CSS3, WAI-ARIA), authoring tools, development frameworks, user agents (any software that retrieves, renders and facilitates end user interaction with web content (World Wide Web Consortium [W3C], 2013b)), and other supportive technologies, there are several ongoing researches and products. However, the knowledge about this research topic is still fragmented and usually results in a lack of standardized behavior for the existing RIAs. As a consequence, people, especially those with disabilities, face several problems while interacting with RIAs (Buzzi, Buzzi, Leporini, Mori, & Penichet, 2010).

This chapter presents a Systematic Literature Review (SLR) of studies approaching awareness of others in collaborative accessible RIAs. The proposed SLR is based on four review questions encompassing: (a) disabilities being considered, and the geographical context of the authors, (b) awareness of others, (c) recommendations, guidelines and design patterns (named RecGuidPat for simplification), and (d) involved technologies. The review questions are formally defined in the review planning. The SLR results are divided into three parts: (1) an overview of the reviewed studies and focus on aspects related to the first two review questions, (2) RecGuidPat for accessibility in RIAs (3) technologies present in the reviewed studies. This chapter presents and analyzes the main findings regarding the overview of the reviewed studies and the technologies approached by them.

This chapter is organized as follows: Next subsection presents background information in which this research is situated. Following, we present the SLR process. Then, we present the SLR results, followed by a discussion on them, and the final remarks.

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