Chapter 1

A Semantic E–Collaboration Approach to Enable Awareness in Globally Distributed Organizations

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ABSTRACT

Collaboration in temporal and spatially distributed environments has consistently faced the challenge of intense awareness extensively more than locally concentrated team play. Awareness means being informed, in conjunction with an understanding of activities, states and relationships of each individual within a given group as a whole. In multifarious offices, where social interaction is necessary to share and locate essential information, awareness becomes a concurrent process that amplifies the exigency for easy routes where personnel can navigate and access pertinent information, deferred or decentralized, in a formalized and context-sensitive way. Even as awareness has become a more pressing topic, extensive disagreement still remains concerning how any type of transparency can be conceptually and technically implemented. This paper introduces an awareness model to visualize and navigate such information in multi-tiers using semantic networks, GIS (Geographic Information Systems) and Web3D. Ultimately, the model presented is used for an evaluation from a business organization’s perspective.

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INTRODUCTION

The term E-Collaboration was originally introduced by Kock (2005) along with the following six key conceptual elements: the collaborative task, E-collaboration technology, individuals involved in the collaborative task, mental schema possessed by the individuals, the physical environment surrounding the individuals and the social environment surrounding the individuals. The present investigation will focus primarily in the domain of the second and third key elements; namely, E-collaboration technology (especially semantic web, GIS and Web3D) and individuals involved in the collaborative task (roles and responsibilities of personnel of the distributed organization).

An identification of classes for E-Collaboration Systems is given by Riemer (2009). He builds a catalog of classification criteria which he uses to generate a classification scheme using cluster analysis. Based on the cluster results, four main system classes emerged that characterize E-Collaboration systems. The conceptualized system outlined here can be well classified into the class of integrated systems of his developed scheme, especially into a subclass called Real-time collaboration (RTC) systems. RTC systems are mainly used for real-time coordination purposes and for the creation of awareness in the context of distributed work scenarios. These systems purport to present an answer to challenges such as a lack of awareness between co-workers’ activities and their respective locations. However, a problem ensues as the communicative complexity increases proportionately to the number of available communication channels and devices introduced, and personnel are thus faced with an increase in communication volume, and work interruptions, which is accompanied by a poor system for identifying the availability of their co-workers. The latter typically impedes information access and the free flow of knowledge. This challenge is addressed by the awareness model described below.

The principle motivation for this article lies in resolving the problem of the major disagreement on how to implement awareness in order to solve many of these problems. Awareness is an integral CSCW (computer Supported Cooperative Work) research component, which Dourish and Bellotti (1992, p. 107) define as follows:

...awareness is an understanding of the activities of others, which provides a context for your own activity.

With growth in the area of sensor technology and RFID (Radio Frequency Identification), a new version of the expression awareness has been established dubbed “Real World Awareness” (RWA), a rendition expanded around the ability to perceive information of persons as well as of systems in real time, and to instantaneously react to that information competently (Heinrich, 2005, p. 24):

Real World Awareness is the ability to sense information in real-time from people, IT sources, and physical objects – by using technologies like RFID and sensors – and then to respond quickly and effectively.

RWA is intended to reduce or dissolve media disruptions, and thus minimize, or even close, the gap between natural and virtual worlds. The natural world exists in the physical and operational reality such as persons, products and virtual worlds. The natural world exists in information technology such as ERP (Enterprise Resource Planning) and SCM (Supply Chain Management) systems as well as local, regional and global information networks.

The literature (see Heinrich, 2005), reflected the basic idea behind Real World Awareness and can be summarized by following three essential points:
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