Chapter 7.9
The Vineyard Approach:
A Computational Model for Determination of Awareness Foci in Email-based Collaboration

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ABSTRACT

Recent research has noted that individuals engage in multiple collaborations simultaneously and have difficulties managing these different contexts. Studies indicate that awareness of others' activities plays an important part in collaboration. Proximity also has a strong effect on collaboration, as maintaining awareness of peers becomes harder in distributed environments. Many awareness systems have been proposed to deliver information on peers' activities or status, which usually either require extensive configuration by the user or disseminate information regardless of users' interests. With the increase in information available, systems must be sensitive to users' attention foci, minimizing interruptions, and helping focus and providing information according to current tasks. We have been investigating ways to determine awareness foci through e-mail-based user interaction analysis. Our goal is to be able to draw inferences as to whom and about what a user is collaborating, enabling a system to automatically distribute awareness information and adapt itself according to users' needs without much configuration.

INTRODUCTION

People often participate in several projects at the same time, dividing their time and attention accordingly (Moran, 2005). Recent studies have shown that individuals organize themselves and their work to accomplish different tasks, very often with different collaborators multitasking among

these different groups (Gonzalés & Mark, 2005). Participation in multiple groups usually means that, depending on the situation, an individual might have distinct roles and obligations, perform different activities, and work towards different goals, all of which must be managed so they do not conflict with each other. When individuals collaborate, they often shift back and forth between individual and shared work (Gutwin, Greenberg, Blum, & Dyck, 2005): to a large extent, collaborative work is performed individually and periodically synchronized with others. This means that individual activities must be supported and tied to their group context as appropriate (Pinelle & Gutwin, 2005). In these conditions, individuals need tools that enable them to quickly switch into closer interaction when necessary and to easily relate their work to that of others.

The dissemination of network technology and adoption of distributed work teams by organizations has led to a move towards remote work: individuals that used to be collocated might now be spread throughout the world. In virtual work teams, members are geographically dispersed and communicate and coordinate via electronic tools (Hertel, Geister, & Konradt, 2005). In collocated environments, individuals can observe others and accompany their activities, thereby gathering awareness information (Gutwin & Greenberg, 2004). In virtual environments, opportunities for collaboration, interaction, and information exchange are compromised, as are casual interactions and observation of others. The focus of our research is on improving awareness of the work environment in order to facilitate group work. We present a method to automatically distribute task awareness information among group members, based on the discovery of collaborative partnerships through interaction analysis. The Vineyard system has been conceived as a means of integrating individual work with its group context, with the goal of improving cohesion and reducing fragmentation. We expect such a system will promote informal interaction and facilitate opportunistic collaboration when deployed.

The remainder of this article is organized as follows: in the next section, we briefly present the theoretical underpinnings of our research, followed by a presentation of related systems in the third section. The Vineyard approach is presented in the fourth section, followed by a preliminary analysis in the fifth section and a discussion in last section.

THEORETICAL BACKGROUND

Recent observations have brought to light the networked nature of work. Castells (1996) has argued extensively that network technology has led to structural changes in organizations and personal relations, transforming them into networks of interconnected elements. This networked form leads to higher adaptability and flexibility, as it is well suited to handle the highly dynamic environment within which organizations must now operate (Bernoux, 1999). In a similar vein, Wellman and Gulia (1999) have long pointed to the existence of personal networks, through which individuals relate to each other, form communities, and get work done, and Granovetter (1973, 1983) showed how individuals navigate these networks to achieve objectives such as finding jobs, stressing the importance of having several ties to different people. More recently, Nardi, Whittaker, and Schwarz (2002) described how people work within "intensional networks", and the amount of work that goes into creating and maintaining these networks. With the dissemination of networking technology, this type of configuration should become more frequent, as individuals will find it easier to form networks to achieve goals.

In day-to-day situations, groups of actors have control over job allocation, production planning, and control (Carstensen & Schmidt, 2002). This enables a group to quickly adapt to new demands generated by the environment or unexpected events. Many of these decisions are the result of arrangements between peers, which reflect on