Chapter 13
An Empirical Study of Group Awareness Information in a Web-Based Group Decision Support System

Nipat Jongsawat
Siam University, Thailand

Wichian Premchaiswadi
Siam University, Thailand

ABSTRACT
Group awareness information is important information for group work. It represents group members’ roles and responsibilities, their positions on an issue, their status, and the state of various group processes. The group awareness information presented in this article is designed to capture group member activities and their behaviors in web-based collaborative work. In this article, group awareness information is represented with a visual display and consists of activity and availability information. The application of this proposed scheme is designed and implemented in a web-based group decision support system. This article reports on the results of a study that examined group performance on a given task in a web-based group decision support system with and without group awareness information. The study examined how group awareness information impacts the quality of the work effort and a given task, group decision making by members in the same group and different groups, the communications among group members in the completion of an online collaborative authoring task, the cohesiveness among group members in a web-based group decision support system, and the commitment/disposition of group engagement.

INTRODUCTION
In a traditional or face-to-face group meeting and/or group decision support system, group members working in close physical proximity have access to a large amount of information about one another. This includes such things as the presence or absence of members of the work group, what they are working on, who they are working with, how actively they are working, how they feel physically and emotionally, etc. This information is obtained directly through communication and...
indirectly through observation of shared artifacts (Beaudouin-Lafon, 1994). Computers are being used more frequently to assist in cooperative tasks (Ellis, Gibbs, & Rein, 1991). When people collaborate via computer mediation, this information and the opportunity to access it are diminished. Increasing the amount of information about group availability in a computer mediated collaborative support system should increase the group’s ability to complete a task. When people work together, they share a task on which they cooperate, one or more artifacts, and a social context. Supporting awareness of the activity of other members in a collaboration team and of changes in the shared work materials is very important in collaborative work systems (Brown & Duguid, 1994). Tatar et al. (1991) found that people required up-to-date information about others, e.g., who just made a modification, to collaborate effectively in “What You See Is What I See” (WYSIWIS) systems. Moran and Anderson (1990) suggests that awareness information is important because it provides information about availability in an indirect way. Generally, people pay attention to the activities of others. The presence and behavior of other people helps to define the meaning of situations for an individual and can have an influential effect on his or her behavior, attitudes, and feelings in interaction in group-work situations (McGrath, 1984). This research outlines issues and opportunities related to the use of tools to improve collaboration. Specifically, it discusses increasing awareness information and information about the status of individuals contributing to collaboration.

Research on computer-supported communications has been going on for over twenty years. A variety of computer-mediated systems have been developed to support group meetings. Group Decision Support Systems (GDSS) have been defined as “an integrated computer-based system to facilitate the solution of unstructured or semi-structured tasks by a group that has joint responsibility for performing the specific task” (DeSanctis & Gallupe, 1984). Power et al. (2002) defines a web-based decision support system as a DSS built with web technologies so that the DSS users can access it with web browsers deployed on corporate intranets to support internal business processes or they can be integrated into public corporate web sites to enhance services for trading partners. The goal of a web-based GDSS is to achieve a final group decision with a high level of quality and effective consensus of needs. Web-based GDSS has been well established and continually developed since the year 2000. Researchers have proposed various methods for web-based GDSS in order to achieve the highest quality of group decisions or tasks. In this article, we propose methods of designing and establishing group awareness information as visual information in a web-based group decision support system and presenting the awareness information to group members when they work together on given group tasks. The article is organized as follows: more detail about various aspects of awareness information is presented. The design and implementation of group awareness information in a web-based GDSS is described in more detail. The methodology of the experiment that was performed and the experimental study and the results are given.

BACKGROUND

There are a number of theories concerning awareness information and cooperative work, but this article only discusses a subset of them. The specific theories discussed have been chosen because they appear to be most applicable to the analysis and design of group awareness information in a web-based group decision support system.

AWARENESS INFORMATION

The word awareness, when used in the context of computers, can be defined in many different ways depending on how it is applied and who applies it.
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