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Introduction

In the computer supported collaborative work (CSCW) field, there is heavy reliance on awareness of all parties involved. Group awareness – what this awareness is called – can make or break collaborations involving distant meetings. To fully grasp the underlying supporting pillar of all CSCW applications, group awareness needs to be evaluated for the successful implementation of future CSCW applications. What group awareness brings to the CSCW table, the different types of group awareness, how basic interactions with people bring about awareness, and the negative aspects of these interactions, all need to be considered to understand the gravity of properly including group awareness in CSCW applications. By understanding these ideas, and incorporating current group awareness solutions that have been proven to work, suggestions for what group awareness methodologies should be integrated into CSCW applications can be developed.

Group Awareness

To understand the affects of group awareness on CSCW applications, it first needs to be understood what group awareness actually is. “There is no single definition for awareness, and that the term is used in very different situations” (Liechti, 2000). Considering this point, Liechti describes group awareness as conveying “information about the state and activities of people within a team. This information does not have to be very precise: many tools only give a general idea about what is going on” (2000). Espinosa and others state that “Group awareness has been defined as ‘an understanding of the activities of others, which provides a context for your own activity’” (2000). Salcedo follows with exactly the same lines saying that “group awareness as ‘an understanding of the activities of other which provides a context for your own activity’” (2001). The idea intrinsic to all of these authors’ views on what group awareness is, is relatively the same: to allow persons in a group the ability to

understand the state of the rest of the group, allowing greater productivity through increased efficiency of collaboration.

Reasons to Support Group Awareness

Why should group awareness be supported in CSCW applications? Group awareness provides facilities to anticipate others actions, open communication channels, find help and coordinate. “Awareness of others provides information that is critical for smooth and effective collaboration” (Gutwin, Penner, & Schneider, 2004). This implies that group working together, whether geographically distant or not, need to know what others in the group are doing for that group to be successful. “The value of providing awareness to teams ... indicates that member of workgroups will be more successful if they maintain awareness of the state of the team, task, and environment” (Espinosa et al., 2000). Indeed, “the challenge and importance of supporting coordination and shared awareness among work group members has long been recognized, particularly when group members spend limited time co-located” (Brush & Borning, 2003). Considering the fact that “most ... written works are produced collaboratively” (Salcedo, 2001), along with an increasing amount of business meetings, group awareness becomes critical for group tasks. Group tasks are all the tasks that a group needs to take to accomplish the goals set for that team: “Group tasks involves activities such as initial design and specification, work structuring, integration of components, and also testing and debugging during integration of components where several groups and individuals are involved” (Magnusson, Asklund, & Minor, 1993). By providing awareness about what others are doing in the group, a shared mental model can be developed, triggers new ideas on how to solve a problem (Espinosa et al., 2000). The major benefit to providing awareness lies in the ability to increase coordination and initiate communication (Liechti, 2000). When group awareness is high, there will be a higher team

performance through a more-effective problem-solving process (Espinosa et al., 2000). As the purpose of CSCW applications is to provide these features within the application, including the ability to provide group awareness becomes a vital part of the skeleton for a CSCW application.

Types of Communication

There are two main types of direct communication that bring about awareness in groups: synchronous and asynchronous communication. Synchronous communication happens in real-time – through instant messaging, group meetings, and conference calls – any form of communication that occurs between two or more people at the same time. Asynchronous communication involves communication between two or more people that happens over a period of time, not necessarily at the same time – such as distribution lists and forums. Conceptually, the median for transferring the information to the other users of the system is rather unimportant – the way this information is transferred to the other user is. Synchronous communication tends not to be logged anywhere in current CSCW systems, allowing for the loss of knowledge and consequently awareness information. “Since text chat is not archived, any developers who are not reading a particular conversation will lose access to that information” (Gutwin, Penner, & Schneider, 2004). Although this information is lost after the conversation has ended, the awareness and knowledge gained through the conversation is still vital to the collaboration. Asynchronous communication provides the ability to view past history allowing for knowledge and awareness to be gained about the group work. “A shared revision history ... provides overview and will make team members aware of each others’ changes at a coarse level” (Magnusson, Asklund, & Minor, 1993). Implementing both types of communication – synchronous and asynchronous – is therefore vital to allow increased group awareness.

Today Messages

One way that has been implemented and rather successful for providing group awareness is the idea of 'today messages'. With single user applications, and even some CSCW applications, "do not provide detailed awareness information about participants' actions and locations. The information is provided only by telepointers, representations of remote collaborator's cursors" (Gutwin, Penner, & Schneider, 2004). Today messages were developed to alleviate this problem at a very low cost and provide useful awareness information to the rest of the group. These messages are basically short status reports sent by each individual user at the end of the work day, stating what they have done; typically sent through email. Users only wrote the emails when they worked on the project, with no guidelines as to what they had to write (Brush & Borning, 2003). It was found that "the messages had the unexpected effect of increasing group awareness of each other's tasks and activities at very low cost" (Brush & Borning, 2003). "Before the research group started writing 'today' messages people did not find it easy to know what others were doing" (Brush & Borning, 2003).

Distribution Lists & Chat

Along with the concept of today messages, another closely related practice found in the field today is the use of distribution lists and chats. Distribution lists are conceptually the equivalent of group email, and chats are instant messaging conversations. These "text channels have a number of characteristics that are valuable for the provision and collection of awareness information" (Gutwin, Penner, & Schneider, 2004). Although common thoughts about self-regulated awareness information distributed through these medians have a social stigma of not being effective (Brush & Borning, 2003), the opposite was actually found: "people do take the time to explicitly inform others", use these medians successfully,

and “allow people to find out who the experts are in an area” (Gutwin, Penner, & Schneider, 2004). The reason that this occurs is relatively simply – authors post to the list to provide information on what they are doing, which inadvertently supplies awareness information as well – but only if a majority of the people read this list and are open about what they are doing on it (Gutwin, Penner, & Schneider, 2004). Awareness information is gleaned from the distribution list after posts are made, and users read back through the list to catch up. “Group awareness information is implicitly conveyed to others reading the list. The phenomenon is comparable to the kinds of overhearing observed with voice communication, in ship navigation teams and pilot-controller conversations” (Gutwin, Penner, & Schneider, 2004).

Negative Aspects

There are also some negative aspects found in group awareness that should be considered. Group awareness essentially provides information to groups; the concern is that this information be preserved and only used for what it was originally intended for: to provide awareness information, not to provide a means to evaluate the performance of people (Brush & Borning, 2003). Another critical problem that may occur in group awareness is the social equivalent of groupthink. Groupthink in a social context is the idea that groups will universally conform to answers created within the group, no matter if they are right or wrong solutions. It was found that “groups that used the awareness tool tended to converge and agree upon a solution more quickly. However, it was found that individuals who did not use the awareness tool got closer to the correct solution” (Espinosa et al., 2000). Although there is no simple solution to solve the problems that arises from this, a suggestion of always having a “devil’s advocate” – someone who always challenges the suggestions, even if they think they are the correct ones – should minimize the effects of this phenomenon.

Conclusion

When implementing group awareness into CSCW applications, it is therefore critical to include the following medians and types of communication. The application should provide for both *synchronous* and *asynchronous* types of communication through instant messaging, email, and histories of communications. Using distribution lists and 'today message' has been proven to be ideal for the latter type of communication – allowing awareness information to 'seep' through to other members in the group. Chats provide synchronous communication to users, supplying the ability for chance meetings online – another critical context. In addition to this, typical awareness information such as users' online status, schedules and contact information should be incorporated into CSCW applications. While incorporating this information into these applications, steps should be taken at both application and social level to reduce the negative affects of group awareness as well – minimizing the risk of people losing trust in the system through the incorrect usage of awareness information, and the reduction of groupthink. Group awareness is a critical aspect to CSCW applications and exists within these applications at some level even without explicitly developing for group awareness. These concepts are of significant importance in the CSCW application development fields.

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