INFORMATION EXCHANGE PATTERNS IN A COMPUTER-SUPPORTED COOPERATIVE WORK ENVIRONMENT

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Software for supporting cooperative work, or groupware, is an approach for increasing project team productivity by changing the way team members work and communicate with each other. Since groupware use can be influenced by various individual, team, and organizational factors, empirical research is needed to "... study the flow of members' interaction to discover the impact the technology is having on the nature of the group's cognitions, actions, and feelings, and the relationship between these attributes of information exchange and decision outcomes (DeSanctis and Gallupe, 1987, p. 603)." The objective of this study is to examine patterns of computer-supported information exchange in a cooperative work environment. The environment requires colleagues to work together to complete a project within a specified time frame. The patterns of information exchange observed should provide insight into what aspects of groupware are perceived as helpful by users, and provide directions for further research.

Participants were graduate students specializing in information systems at a large midwestern state university. They self-selected into three teams. Each team was assigned a portion of a network analysis and design project to complete as part of their required course work. One team was assigned responsibility for making local area network recommendations (LAN Team), the second was required to provide wide area network recommendations (WAN Team), and the third team was in charge of coordinating information and delegating tasks between the other two teams (Managerial Team). The teams were required to work together to complete the project, necessitating both intra- and inter-group communications.

The groupware used in this research is a commercially available software package that automatically supports, tracks, and organizes work producing conversations. It also provides for unobtrusive tracking of all communications. The groupware was installed on a local area network (LAN) consisting of a single file server and four workstations in various locations, and participants were given twenty-four hour access to all of the locations.

When the participants had completed the project, the record of all communications which had been stored by the groupware was examined. All of the messages were categorized into one of five categories: Instructional, Managerial, Scheduling, Social, or Task. We also examined the content of the messages. Many of the messages included jokes and innuendos that suggested the participants were behaving naturally, and were not influenced by knowing the messages would be read by the researchers.

The task was separated into three time periods corresponding to the weeks that the participants worked on the project. We then examined the average number of messages per day by message type for each period (a "volume" measure), and the relative percentage of each

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message type in a given period, that is, the "message mix" in each time period. There was a relatively constant percentage of managerial messages over time, which averaged about thirty percent. Related to this is the shift in the usage across teams. The managerial team was the highest user in the early periods, and their relative percentage use decreased over time. This was most likely due to the managerial team providing instructional messages during the early periods.

There was also a shift in the message mix over time. In particular, there was a significant change in the scheduling and task messages between periods two and three. The emphasis in period two was on scheduling meetings to discuss interim results and to coordinate efforts, while in period three the emphasis was on final task completion. The amount of social messages sent were relatively minor compared to task related messages. Social messages averaged less than ten percent during periods two and three.

In discussions regarding desirable groupware features, participants indicated that groupware should be capable of activation on demand, that is, it should be a terminate and stay resident (TSR) package. This would allow a group member who is working in the word processing mode to call up the electronic messaging mode and leave a message for someone without having to exit the document. The TSR software should also allow for a notification system for a user who is working in a non-messaging mode that a message arrived. The user could then retrieve the message without exiting the current application. Additionally, any multi-authoring system included with groupware should provide for a lock-out capability similar to a record-locking feature provided by some database management systems designed for networks. This would allow two or more people to work on different portions of the same document simultaneously.

This study has examined groupware usage patterns over a several week time period. The patterns of use were examined relative to the participants completing a particular task. Several patterns were noted, including a traditional learning curve, a consistent percentage of total messages that were classified as managerial, minimal social use of the system, a shift in the message mix over time, and

a capture of the particular teams' work habits. These patterns and other qualitative data gathered from the participants provide insight into the use of the system and identification of features that should be included in groupware systems.

REFERENCE

DeSanctis, G. and Gallupe, R. B., (1987). A foundation for the study of group decision support systems. Management Science. 33. 589-609.

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