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Information Exchange in Virtual Work Groups: The Effects of Member Tenure on Use of E-Mail Messaging

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Abstract

Virtual groups that communicate and coordinate their activities using e-mail continue to increase as an organizational form. Prior research, however, provides limited insight into how individuals within these groups communicate. Studies that investigate small group processes have suggested that individual status differences affect the communication behaviors of group members. This paper examines one such status element, *tenure* (length of time affiliated with a group), and its influence on individual communication usage in the context of virtual groups. A content analysis of e-mail communication among members of the group during a three-month period was performed. Empirical measurement found differences in communication use patterns for established members versus newcomers in the group. Results suggest that, as in traditional groups, newcomers primarily use an *information seeking* mode in their communication and established members use an *information providing* mode. Along with this preference for a particular type of exchange behavior, differences were found in the *content* of information exchanges depending on whether *information seeking* or *information providing* was being used. Newcomers had higher levels of regulative exchanges than cognitive exchanges whereas established members had higher levels of cognitive exchanges than normative exchanges. Finally, individual performance was shown to be related to membership message activity.

Introduction

Geographically dispersed (virtual) collaborative work groups continue to become popular as electronic technologies expand an organization's ability to link together resources that are separated in time and distance (Fulk and DeSanctis 1995). The formation of collaborative work groups that are geographically dispersed and have little, if any, face-to-face contact is seen as a way of improving organizational performance by using electronic communication technology to quickly and dynamically integrate knowledge resources, regardless of their location, (Nonaka and Takeuchi 1995; Lipnack and Stamps 1997). With more and more individuals working apart - whether from home, traveling, or remote offices - one of the challenges in the management of virtual groups may be the adjustment and adaption of group members to this new communication environment.

In distributed settings where face to face interactions are limited, communication technologies form the context within which members have to convey social as well as technical information to one another (Poole and Hirokawa 1996). The objective of this research is to explore how *established* and *new* team members, in a geographically disbursed, collaborative group (i. e. a virtual team), use electronic communication for the purpose of task accomplishment and socialization. In this research, a virtual group is defined as a "group of people who collaborate closely even though they are separated by space, time, and organizational barriers," (Lipnack and Stamps 1997) and use information technology as the communication medium for achieving their common goal(s).

A Model of Communication and Performance in Virtual Groups

The research model (Figure 1) draws on two streams of research - the first concerns newcomer assimilation into an organization and the second concerns the use of computer mediated communication group settings.

The model suggests that membership status (tenure) influences individuals' information exchange behavior. Information exchange behavior (seeking or providing) is related to information exchange content (norms, expectations, or technical) which in turn affects individual performance. In this research, membership status refers to the length of time an individual has been part of the group. The literature review associated with the model provides the basis for the following hypotheses:

Hypothesis 1: Newcomers to a group will exhibit higher levels of Information Seeking behavior than Information Providing behavior.

Hypothesis 2: Established Members of a group will exhibit higher levels of Information Providing behavior than Information Seeking behavior..

Hypothesis 3: Information seeking behavior will be related to higher levels of Regulative information exchange content than Cognitive information exchange content.

Hypothesis 4: Information seeking behavior will be related to higher levels of Normative information

exchange content than Cognitive information exchange content.

Hypothesis 5: Information providing behavior will be related to higher levels of Cognitive information exchange content than Normative or Regulative information exchange content.

Hypothesis 6: Group members exhibiting high levels of Normative, Regulative, or Cognitive information exchanges will also exhibit higher levels of performance in the group than members exhibiting lower levels of Normative, Regulative, or Cognitive information exchanges.

Figure 1 - Research Model

Research Methodology

The “virtual group” chosen for this study was a consortium of universities and corporations involved in the design and use of a general-purpose artificial intelligence system (SOAR). The SOAR group does not share a single, physical space since its members are spread throughout the world. A three month period of archived e-mail messages was examined using a content analysis approach. The resulting data were then subjected to

qualitative evaluation. The focus of the analysis was on the interactions between the individual team members to establish the relationship of member status to message content and to individual performance in the group.

Findings

A total of 673 messages were content analyzed using the defined categories. A summary of the resulting content analysis is provided in Table 1.

Information Behavior	Exchange Content	Membership	Status	Row Total
		Newcomer	Established	
Information Seeking	Normative	4 (11%)*	31 (89%)	35
	Regulative	39 (31%)	87 (69%)	126
	Cognitive	12 (22%)	45 (78%)	57
	<i>Sub-Total</i>	<i>55 (25%)</i>	<i>163 (75%)</i>	<i>218</i>
Information Providing	Normative	5 (5%)	103 (95%)	108
	Regulative	14 (8%)	171 (92%)	185
	Cognitive	12 (7%)	150 (93%)	162
	<i>Sub-Total</i>	<i>31 (7%)</i>	<i>424 (93%)</i>	<i>455</i>
<i>Totals</i>		<i>86 (13%)</i>	<i>587 (87%)</i>	<i>673</i>

* The percentage in parentheses is based on the row total.

Table 1 - Message Summary

Visual inspection of the data provides initial support for the hypotheses. The data in Table 1 for hypothesis 1 and 2 for example, are consistent with the expectation that newcomers will have greater *information seeking* behavior than *information providing* behavior (55 versus 31) and established members will have greater *information providing* behavior than *information seeking* behavior (424 versus 163). A chi-square analysis was done for hypothesis 3 through 6 and provided mixed results. For instance, Hypothesis 3, suggesting that information seeking behavior will be associated with higher *normative* content than *cognitive* content, was not supported even though the result was significant at the <.05 level. The data (35 normative versus 57 cognitive) indicate a relationship in the opposite direction to what was expected. Additional analysis showed support for hypothesis 4, 5 and 6.

Summary

The analysis of communication exchanges provides general support for the research model and hypotheses. The data suggests that information seeking is the dominant style of communication for newcomers and that the types of information requested is consistent with their need for normative and regulative knowledge to reduce uncertainty in their environment (Comer 1991; Ostroff and Kozlowski 1992; Morrison 1993; Teboul 1994). Established members are found to be the primary providers of information.

Empirical measurement found differences in communication use patterns for established members versus newcomers in the group. Along with this preference for a particular type of exchange behavior, differences were found in the *content* of information exchanges depending on whether *information seeking* or *information providing* was being used. Newcomers had higher levels of regulative exchanges than cognitive

exchanges and established members had higher levels of cognitive exchanges than normative exchanges.

Implications for Management

Virtual groups have needs similar to those of traditional groups but also have unique requirements because of their electronic environment. This study attempted to look at membership status and its effect on communication characteristics. By understanding how virtual groups communicate and coordinate, better support might be provided which in turn can lead to better performance. Research to identify how group members use communication media for socialization as well as technical exchanges is greatly needed since the use of virtual groups is greatly expanding.

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