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Negotiating Technology Choice in Groups: The Importance of Shared Realms of Consideration

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NEGOTIATING TECHNOLOGY CHOICE IN GROUPS: THE IMPORTANCE OF SHARED REALMS OF CONSIDERATION

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Abstract

Previous work on group technology choice, such as task-technology fit (Goodhue 1995; Zigurs and Buckland 1998), has typically taken a deterministic perspective, failing to substantively consider the impact of individual differences among team members in terms of experience, knowledge, and/or perceptions of the group's task and technology choices. We attempt to fill this gap in the literature by integrating the work on task-technology fit with the literature on mental models, shared mental models, and transactive memory.

Most previous conceptualizations of task-technology fit are based on an assumption of ideal fit. Moreover, if the user or group selects the "right" technology for the task, performance improvements will result. The user's perceptions about the task and technology are rarely taken into account. However, these perceptions are anchored in the user's knowledge of or experience with the task and technology and certainly influence fit perceptions and technology choices. Users might not have knowledge of every characteristic of the task they are being asked to accomplish. This view is consistent with Zigurs and Buckland's (1998) characterization of complex tasks. Such tasks can be experienced as ill-structured, ambiguous, or difficult due either to attributes of the task or attributes of the individual. Zigurs and Buckland (1998) provide the example that a software development task may be experienced as "simple" for a veteran programmer but "difficult" for a novice. As such, the novice's differential knowledge of the task – stemming from experiences different from that of a veteran – is likely to result in a different fit perception.

While individual knowledge structures may be helpful in understanding individual technology choices, we are interested in understanding how these structures impact the negotiation of team technology choices. It has been suggested that the work on individual mental models may provide a good starting point for examining the knowledge, understanding, and perspectives individuals bring to the group process (Massey et al. 1997). Further, work on shared mental models begins to describe the complex interrelationships among the individual mental models. Finally, research on Adaptive Structuration Theory (DeSanctis and Poole 1994), Social Cognition Theory (Pryor and Ostrom 1987), and socially shared knowledge (Levine and Moreland 1991) is particularly relevant to this issue. Certain concepts appear in more than one of these theoretical bases. For example, the *task characteristics* expressed by work on task-technology fit (Goodhue 1995) are similar

to both the contents of the shared mental model of *task* (Cannon-Bowers et al. 1993) and *knowledge about work*, articulated by Levine and Moreland's (1991) work on socially shared knowledge. Given this surfacing of related concepts across theoretical bases, five different knowledge domains emerge as being applicable for members of a group selecting a technology in order to achieve a group task: *Task*, *Technology*, *Self*, *Teammates*, and *Team Interaction*. A group member's knowledge of these five domains will influence the technologies considered.

Understanding what technologies have been considered is an important antecedent to understanding the technology choices made. We refer to an individual's cognitive list of all technologies (or functionalities of those technologies) which s/he perceives as being applicable to the scenario at hand (i.e., task and personnel) as his/her *realm of consideration*. In a situation where the individual is not working as a member of a team, he/she would select a technology or functionality to use from this realm of consideration. However, in a team setting, because this process becomes a negotiation or a directive, a *shared realm of consideration* is constructed. This shared realm – and ultimately the technology selected by the group – may not fully represent one or many of the team members' individual realms of consideration.

The purpose of this study is to examine how the shared realm of consideration is constructed and subsequently impacts group outcomes. The literature on transactive memory systems provides a solid framework for understanding this process, because the concept of transactive memory "draws deeply on the analogy between the mental operations of the individual and the processes of the group." (Wegner 1987, p. 185) Wegner describes transactive memory systems as follows:

> "The transactive memory system in a group involves the operation of the *memory systems of the individuals* and the *processes of communication* that occur within the group. Transactive memory is therefore not traceable to any of the individuals alone, nor can it be found somewhere 'between' individuals. Rather it is a property of a group." (Wegner 1987, p. 191, emphasis added)

Therefore, both individual mental models (memory systems) and communication are necessary components of a transactive memory system. That is, if a team member's knowledge is never communicated, then that knowledge cannot be a part of the team's transactive memory system. This view is similar to the argument that features of a technology of which the user is unaware will play no role in determining the user's perceptions of task-technology fit. Because individual mental models of group technology use will allow users to populate their individual realms of consideration, a transactive memory system comprised of individual mental models of group technology use will enable a shared realm of consideration, akin to Sarker, et al.'s (2005) concept of group valence. The fact that transactive memory systems require communication surfaces a key point: the shared realm of consideration is defined as those technologies or functionalities which are actually mentioned (and hence, communicated) during the process of negotiating a technology choice. We contend that the shared realm of consideration will both inform and be populated by the process of negotiating a technology choice, and as such, will serve as a window into that process.

Group members are more likely to discuss shared information than individual information in group settings (Hollingshead 1996). As such, one might expect negotiations to center around those technology functionalities that appear in more than one team member's individual realm of consideration. However, depending on a number of different dynamics that could emerge in the team negotiation, each team member's individual realm of consideration may or may not be significantly represented in the team's shared realm of consideration. For example, it is possible that the negotiation process might be dominated by a single member or a minority faction of the group.

The *representativeness of the shared realm of consideration* is defined as the percentage of technologies across all individual realms of consideration which are represented in the shared realm of consideration. A highly representative shared realm of consideration might be reflective of a negotiation process which accounts for the thoughts and opinions of each team member, as opposed to one dominated by only a few members. Congruent with the literature on group polarization (e.g., El-Shinnawy and Vinze 1998), we expect that this scenario would be associated with higher team performance as well as higher levels of cohesion, satisfaction, and consensus.

Ultimately, it is the technology chosen for use that directly impacts team outcomes. This too may or may not reflect members' individual realms of consideration. The *representativeness of the technology choice* is defined as the percentage of team members whose individual realms of consideration originally contained the technology which was ultimately selected by the team. We expect the representativeness of the technology choice to have the same relationship with group outcomes as did the representativeness of the shared realm of consideration, for essentially the same reasons. However, there is the additional argument here that those who were originally considering using this technology might have some idea about how the technology can be used to complete the task at hand. As such, they might have some level of expertise to contribute, whereas those who were not considering the selected technology might not know how to use it at all, thus foreshadowing a significant learning curve ahead which might negatively impact performance.

Finally, the rank-order effect dictates that groups which consider a greater number of alternatives tend to make higher quality decisions (Hollingshead 1996). Therefore, we expect the *size of the shared realm of consideration* (i.e., the number of technologies or functionalities mentioned during the negotiation process) to be another factor in determining group performance. Our theoretical model is presented in Figure 1. While this model illustrates the aforementioned group processes as well as their relationship to individual cognitive processes, our intention is to examine only the group-level process.

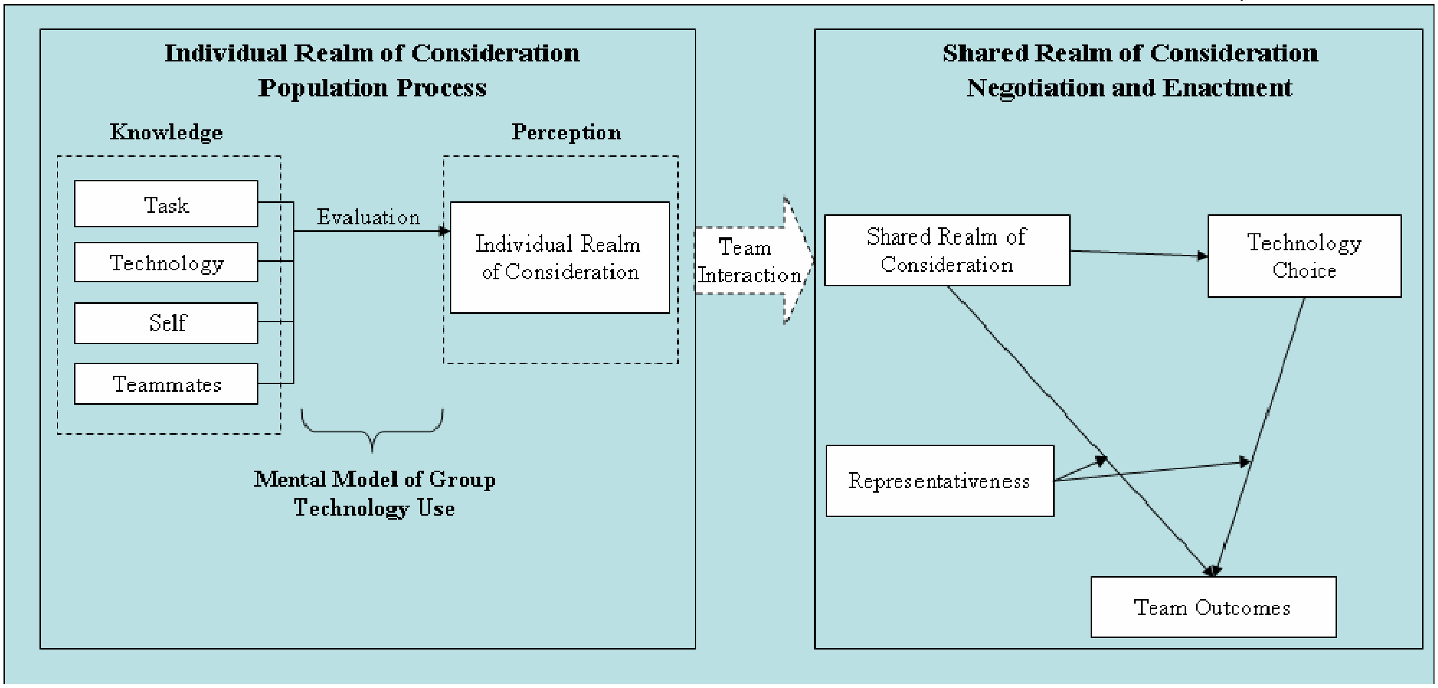

Figure 1: Theoretical Model

We will employ a longitudinal design using virtual teams. We will capture data about the individual realms of consideration of each team member, the emergence of the shared realm of consideration during the negotiation process, and ultimately team outcomes in terms of performance and relational development. The virtual team environment provides the ability to capture transcripts of all team communication thus allowing us to analyze any nuances which may occur during the negotiation process. The longitudinal nature of the study will facilitate richer understanding of the causal relationships among our constructs.

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