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Chapter X

A Measure of Task-Technology Fit for Computer-Mediated Communication

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A key determinant in the success of computer-mediated communication systems (CMCS) and group support systems (GSS) is the task they are used for (Huber, 1984; DeSanctis & Gallupe, 1987). Task models and theories exist in the domain of non-mediated groups (e.g., McGrath, 1984; Wood, 1986) but application of these to GSS and CMCS has been spotty and the results equivocal (Zigurs & Buckland, 1998). Although research findings repeatedly suggest that the fit between task and computer-mediated communication technology is important, researchers have not yet been able to comprehensively describe or measure the dimensions of appropriate fit.

This chapter describes the development and initial testing of an instrument to measure the perceived effectiveness of CMCS based on task type (hereafter *PE measure*). The PE measure extends prior research in several ways. First, it operationalizes the four major dimensions of McGrath's task circumplex (McGrath, 1984; McGrath & Hollingshead, 1994), a model which frequently is used as a conceptual framework for studying GSS and CMCS (Dennis & Gallupe, 1993). Thus, it will be straightforward to integrate findings from studies that use the PE measure into the existing literature. Second, all four task types are incorporated into the PE measure, where prior research has focused primarily on generation tasks and, to a lesser extent, choice tasks. This comprehensive view of the overall task construct should benefit the process of theory-building as well as prediction in practical applications. Third, the PE measure has been tested successfully within heterogeneous task domains, suggesting that the instrument has validity and is relatively robust.

In the following sections we discuss the background and assumptions of our research and develop a set of hypotheses. Then we describe our research method, which involves developing and testing the PE instrument. Finally we discuss our findings and present our conclusions.

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BACKGROUND

The task circumplex model is based on the assumption that all group tasks can be categorized within four main types (McGrath, 1984). These types are distinguished by two components: conceptual vs. behavioral orientation and cooperation vs. conflict emphasis (see Figure 1). The task types are:

- *Generation tasks*, including creativity tasks, e.g., idea generation and brainstorming, and planning tasks, e.g., planning and scheduling;
- *Choice tasks*, including intellective tasks or solving structured problems, i.e., solution of problems that have a correct answer and similar logic problems, and decision-making tasks or solving problems that require consensus among group members;
- *Negotiation tasks,* including cognitive conflict tasks or resolving conflicts of viewpoint, and mixed-motive tasks or resolving motivational conflicts; and
- *Execution tasks*, including performance tasks where there is some objective standard, i.e., *excelling,* and contest/battle tasks where there is competition for victory, i.e., *winning.*

The first assumption of our research is that the different task types require distinct task-technology fit conditions, i.e., one task type might benefit from one particular technology feature, such as text-only messaging, while another task type might benefit more from a different technology feature, such as graphical message attachments. Support for this assumption arises from theoretical and empirical bases. McGrath and Hollingshead (1994) theorize that three task types—generation, choice, and negotiation—are distinguished respectively by increasing information requirements. This idea parallels certain equivocal results that GSS research reports between generation and choice task types. In their review of the GSS literature, Dennis and Gallupe state:

> We are convinced that GSS technology can dramatically improve group performance and member satisfaction for generation tasks, where the group's objective is to draft a project plan, or produce a set of ideas, alternatives, opinions, information, and so forth.... We are less convinced that GSS technology can help groups facing a choice task, where the objective is to choose an alternative(s) from a pre-specified set (1993, p. 74).

Our second assumption is that we can define a task-technology fit construct that is appropriate to CMCS. For this we turn to the related GSS domain, where Zigurs and Buckland define task-technology fit as "ideal profiles composed of an internally consistent set of task contingencies and GSS elements that affect group performance" (1998, p. 323). Part of this definition is directly applicable to our research as we propose, first, to develop a profile of task variables based upon McGrath's task circumplex and, second, to develop a technology profile comprising a controlled CMCS feature set. The use of group performance as a measure is less relevant to CMCS than to GSS research. GSS and CMCS are distinct system types that, we argue, should be measured using different standards. The purpose of GSS is to increase overall group effectiveness (Huber, 1984), which is accomplished by supporting