

# Virtual Teams Adapt to Simple E-Collaboration Technologies

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## INTRODUCTION

Increased globalization of enterprises combined with widespread adoption of simple, low cost, asynchronous e-collaboration technologies (e.g., bulletin board, e-mail) provides incentive to attempt increasingly complex problem solving with virtual teams. If complex business process improvement activities could be conducted using asynchronous e-collaboration, the potential to reduce competition for resources by reducing travel time and increasing the communication window to 24/7 improves the ability to simultaneously address the multiple priorities of daily business and business process improvement.

The knowledge that virtual process improvement teams have been successful (DeLuca, Gasson, & Kock, 2006; Kock & DeLuca, 2006; DeLuca & Valacich, 2006; Kock, 2006) and lessons learned from those teams may be what is needed to provide confidence to organizations that virtual process improvement efforts would come to fruition. To manage such initiatives effectively, it is important to understand *how* these virtual teams overcame the difficulties of e-collaboration. Existing theories of information processing in organizations do not scale well to the complex forms of knowledge integration required at the boundary between the diverse teams found in virtual organizations. Thus, we based our investigation on a new theory of communication behavior, compensatory adaptation theory (CAT) (Kock, 2005b) and the relationships suggested by it, explained in the next section. We also operationalize a key construct, compensatory adaptations and present the adaptations made by participants in the study (DeLuca et al., 2006).

## BACKGROUND

Empirical research results are inconclusive about the effect of e-collaboration and technologies upon communication (Kock, 2005a; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Miranda & Saunders, 2003; Rice, Kraut, Cool, & Fish, 1994; Riva & Galimberti, 1998). This may be because social norms and availability of media may influence media choice significantly more than media or task characteristics, as previously thought.

Asynchronous, electronic, written communication media are generally familiar, sponsored, and conveniently available, yet not commonly used for complex tasks such as business process improvement because of perceived limitations that must be overcome or compensated for in some way in order to effectively communicate (Daft & Lengel, 1986; Kock, 2005b; Majchrzak et al., 2000; Markus, Majchrzak, & Gasser, 2002).

Earlier theories are based on “richness” of a media (Daft & Lengel, 1986) or “social presence” (Short, Williams, & Christie, 1976) and do not provide for making adaptations to use a media. Research on virtual process improvement shows that team members adapt their communication behaviors to compensate for the deficiencies in the “richness” of the communication channel with which they have chosen to work (Kock & DeLuca, 2006; DeLuca et al., 2006; Kock, 2005b). Compensatory adaptation theory (CAT) (Kock, 2005b), posits the processes shown in Figure 1.

CAT is derived from two principles—the media naturalness principle and the compensatory adaptation principle. The naturalness of a media is proportional to its similarity to face-to-face communications (media

naturalness principle). When users of the media perceive a lack of media naturalness, they make adaptations to compensate for the perceived obstacles to communication (compensatory adaptation principle). Media that lack many of the features of face-to-face communications (e.g., immediate feedback, presence of visual, auditory, and social cues) are said to be “lean,” like e-mail and bulletin boards. E-collaboration using lean media is referred to as “lean e-collaboration.” Based on CAT, the central research question (CQ) is:

*CQ: Can process improvement teams using lean e-collaboration be successful and, if so, how do the team members adapt their communication behavior to compensate for perceived shortcomings of the media?*

In a study by Graetz, Boyle, Kimble, Thompson, and Garloch (1998), mental demand, temporal demand, effort, and frustration were all more than 50% higher for those using e-collaboration than those using face-to-face (FTF) communications. This supports the assessment of “low” naturalness for e-collaboration and consistent with earlier studies (Daft, Lengel, & Travino, 1987; Rice, 1992; Rice & Shook, 1990). Kock (2004) offers that the human species has been biologically designed for FTF communication. E-collaboration is less “natural” because co-location, synchronicity, body language, facial expressions, and hearing and speech are lacking (Kock, 2005b).

The perceived obstacles posed by e-collaboration must be overcome or compensated for in some way in order to communicate effectively. Studies show (Kock & DeLuca, 2006; DeLuca & Valacich (2006); DeLuca et al., (2006); Kock (2005b); Ocker, Fjermestad, Hiltz, & Johnson, 1998) that virtual team members take additional care in composing messages transmitted via

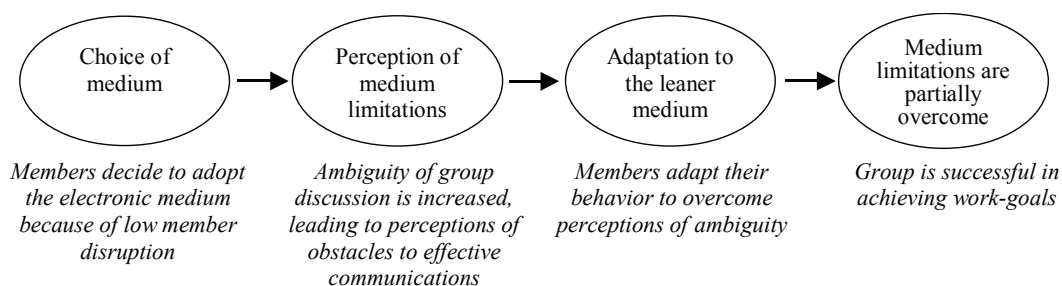
e-collaboration and this compensation may lead to better quality individual input and successful team completion of the process improvement effort by implementing the improvements. Teams that included use of lean electronic media produced outcomes of the same or higher quality than FTF teams. The concept that the adaptations made affect quality and success is unique to CAT (Kock, 2005b) and provides an explanation for virtual team successes with complex tasks that is not offered by earlier theories.

## RESEARCH SITE AND METHOD

This article is derived from a study (DeLuca et al., 2006) that was focused on the communication behavior of four virtual teams from an educational services organization. Virtual teams were studied in their natural environment during one cycle of a larger on-going, traditional (canonical) action research study (see Davison, Martinsons, & Kock, 2004 for principles of canonical action research). All teams chose processes that involved improving the quality of communications among schools, parents, special needs children, and service providers. The teams were cross-functional with from 9 to 11 members. The researcher provided: access to an Internet-based bulletin board and group e-mail to alert virtual team members to check the bulletin board and contribute to it; training on the technology and a typical structured problem-solving process (Kock, 2006); and information on success factors from previous virtual teams and their leadership. The team “outcome” was a re-designed business process.

An analysis of the literature revealed that most discussions related to media naturalness build on some variation of the following three dimensions of media:

*Figure 1. Compensatory adaptation process (Adapted from Kock, 2005b)*



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