Unexpected Outcomes of Lean E-Collaboration

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INTRODUCTION

Over the years, many theories have been used to understand e-communication and e-collaboration behavior (Kock, 2004; Markus, 2005). Arguably, the most widely used among those theories has been media richness theory (Daft & Lengel, 1986) even though there has been mounting evidence that its predictions do not hold in a number of situations (Markus, 1994).

One key prediction of media richness theory is that communication media of low richness (e.g., e-mail as opposed to face-to-face) consistently leads to a decrease in the quality of the outcomes of group tasks. One of the complicating issues associated with media richness theory is that there is abundant evidence that low media richness leads to perceived obstacles to communication (Kahai & Cooper, 2003; Kock, 2004), which is consistent with the theory, yet it is obvious that media of low richness like e-mail are widely used, sometimes even when richer media are easily available (Kock, 2005; Lee, 1994; Markus, 1994).

Even though media richness theory was proposed a long time ago, well before the emergence of modern e-collaboration technologies and the Internet as we know it today, it addressed topics that are highly relevant now. It addressed the notion that characteristics of a communication medium may affect group work, which has been a recurrent issue in recent research (Alge, Wiethoff, & Klein, 2003). Media richness theory and its nonverbal-cues-suppression perspective set the stage for the study of behavioral e-collaboration phenomena at the individual level of analysis, such as "flaming" (Alonzo & Aiken, 2004), and at the group level of analysis, such as group decision making (Baker, 2002). The theory has also motivated research into technological solutions to the problems associated with lean media (Briggs, 2002; Briggs, De Vreede, & Nunamaker, 2003).

In spite of the large amount of research in connection with media characteristics and their impact on group tasks, there has been little empirical evidence that the adoption of a lean medium can lead to increased group outcome quality: a counterintuitive finding that goes squarely against predictions based on media richness theory (Daft, Lengel, & Trevino, 1987; Lengel & Daft, 1988; Markus, 1994). This article provides such evidence based on the study of five process-improvement groups in a New Zealand university.

BACKGROUND

E-collaboration technologies are broadly defined as electronic technologies that enable collaboration among individuals engaged in a common task (Kock, Davison, Ocker, & Wazlawick, 2001). The e-collaboration literature is filled with mixed findings (Orlikowski, 1992), where success in the introduction and use of e-collaboration technologies has been as commonplace as failure (DeSanctis, Poole, Dickson, & Jackson, 1993; Kock, 2004). A number of theories and theoretical frameworks has been proposed that provide a basis for the understanding of these mixed findings.

Among the many theories devised, media richness theory (Daft & Lengel, 1986) stands out for its influence as a deterministic theory of communication-media adoption and use since its development in the mid-1980s. The theory claims that different communication media can be classified as lean or rich according to their ability to convey knowledge and information. The classification scheme proposed by media richness theory places face-to-face as the richest communication medium, and e-mail as a relatively lean medium (Fulk, Schmitz, & Steinfield, 1990; Lee, 1994). Media richness theory claims that lean media are not appropriate for knowledge and information communication (i.e., equivocality and uncertainty reduction), and that the adoption of media and the outcomes of their use will usually reflect this fact (Daft et al., 1987; Lengel & Daft, 1988).

Other factors have been shown to influence group outcomes, and related evidence has been presented to show that those factors influence group outcomes in ways that are either compatible with media richness theory, or in ways that expand and refine the media richness perspective. For example, past research has shown that the nature of the collaborative task (e.g., whether it is simple or complex) can have a strong effect on its outcomes when certain e-collaboration technologies are used. Task-technology fit theory (Zigurs & Buckland, 1998; Zigurs, Buckland, Connolly, & Wilson, 1999) proposes a typology of tasks and e-collaboration technologies, as well as predictions regarding the pairing of certain tasks and technologies, and the impact of that on group outcomes.

Part research has also suggested that the mental schemas (also referred to as knowledge or background;

see, e.g., Kock, 2004; Kock & Davison, 2003) possessed by individuals may influence the impact of e-collaboration technologies on the individuals. This includes socially constructed schemas that may induce the individuals to interpret information in a particular way (Lee, 1994). Particularly, the degree of similarity among the task-related mental schemas possessed by different individuals engaged in a collaborative task (e.g., whether task experts are interacting with other experts, or novices) may significantly affect the amount of cognitive effort required to successfully accomplish the task using certain types of e-collaboration technologies. Kock (2004) argues that the higher the degree of schema similarity, the lower cognitive effort is likely to be required.

GROUPS STUDIED

Five process-improvement groups were studied. Those groups were conducted at a New Zealand university over 7 months. The groups had from 7 to 13 members, and took on average 41 days to be completed. Each group selected, analyzed, and conceptually redesigned one or more business processes; redesign proposals were later implemented and led in most cases to process-quality and productivity improvements. Forty-six structured interviews addressing perceived technology effects were conducted with group members within two weeks of the completion of their groups.

All groups voluntarily adopted an e-collaboration system, namely, an e-mail conferencing system developed by the author, as their main communication medium. The system allowed group members to post e-mail messages and attachments to their groups. The decision as to whether the system would be used or not, and how much, was completely left to the groups themselves.

CHOICE OF MEDIUM

All five groups voluntarily chose the e-collaboration medium for the vast majority of the group interactions, that is, those interactions in which the communication mode was many to many. Phone and face-to-face media were used predominantly for one-to-one communication. That is, the groups consistently favored the e-collaboration medium as their main medium for communication in spite of it being perceived as a leaner medium than the phone and face-to-face media.

When asked to explain their choice, the overwhelming majority of the interviewees assigned a reduction in disruptiveness, typically linked with the possibility of interacting with the group at the most convenient time for

them, as the main reason for the choice of the e-collaboration medium.

ADAPTATION TO THE LEANER MEDIUM

Several members pointed out that they had perceived the e-collaboration medium as likely to add undesirable ambiguity to their discussions. The main reasons given by members were the lack of immediate feedback and the filtering of verbal cues inherent in the e-collaboration medium. These perceptions are highly consistent with predictions based on the media richness theory (Daft & Lengel, 1986).

Plausible predictions based on the media richness theory for future scenarios involving the five groups would have been (a) the perception by group members of an increase in ambiguity in individual member contributions, and (b) either a move to richer media (such as face-to-face) or the discontinuation of the groups, both as a consequence of the higher perceived ambiguity.

None of these scenarios became reality. On the contrary, not only did the groups continue using the e-collaboration medium for most of the group interactions, but also, somewhat to our surprise, most respondents spontaneously reported a perceived increase in member contribution quality.

The perceived increase in member contribution quality can be explained by an adaptation of the members to the leaner medium, an adaptation that was primarily aimed at overcoming obstacles posed by the e-collaboration medium due to what could be characterized as its inherent lack of naturalness when compared with the face-to-face medium (Kock, 2004). Two main pieces of hard evidence strongly suggest this adaptive behavior and some traits of its dynamics. First, members spent more time preparing their individual contributions, which is evidenced by a dramatic decrease in member contribution speed through the e-collaboration medium in comparison with face-to-face meetings.

The mean contribution speed in the e-collaboration medium was approximately 6 words per minute. In face-to-face meetings, this contribution speed has been estimated at 113 words per minute (McQueen, 1991; McQueen, Payner, & Kock, 1999). The contribution speed in the e-collaboration medium was calculated based on group members' estimates (as well as direct measurements) of time spent preparing and posting contributions to their groups and the actual word count of their postings. The low contribution speed through the e-collaboration medium could not be explained only based on the fact that typing is slower than speaking, as average typists are

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