A Macro-Level Approach to Understanding Use of E-Collaboration Technologies

Sanjiv D. Vaidya
Indian Institute of Management Calcutta, India

Priya Seetharaman
Indian Institute of Management Calcutta, India

INTRODUCTION

The term *e-collaboration technologies* (ECT) in an organization refers to the collective system of interactive computer-based tools that facilitate a variety of group tasks. It thus includes among others, electronic mailing systems, bulletin boards, intranets and extranets, messaging systems, group support systems, decision rooms, computer conferencing tools, and computer based video-conferencing systems, etc. ECTs have often been referred to in the literature, using various terms to highlight specific uses such technologies have been put to. These include *group decision support systems, group support systems, computer supported collaborative work, groupware,* and *collaborative technologies.*

ECTs are among the many IT applications that have seen a rapid deployment in organizations due to greater use of task-teams and groups. There is thus an increased use of inter-departmental and cross-functional teams (Sarker, Valacich, & Sarker, 2005). Groups are hence viewed as a "basic unit of the formal organization structure" (Applegate, 1991). Second, the coming of the PCs, the advent of easy-to-use software and the developments in network technologies constitute additional impetus for the use of computers to support collaborative work in organizations.

Use of technology support for collaborative work is believed to increase productivity in organizations. It is hence important to examine the use of such technologies in greater depth (Markus, 1994). Increasing access to communication technologies without adequately understanding the task requirements and the potential change in the work environment and processes may lead to information overload and may not benefit the user. This study therefore, aims at enhancing our understanding of the broad factors influencing the use of ECT in organizations.

The article is organized in the following manner. The first section reviews concerned literature relevant to the use of ECT in organizations. The second section describes a framework depicting the drivers of ECT use in organizations. The framework represents a macro level perspective of the phenomenon. The subsequent section highlights the implications of such a framework and the potential for further research.

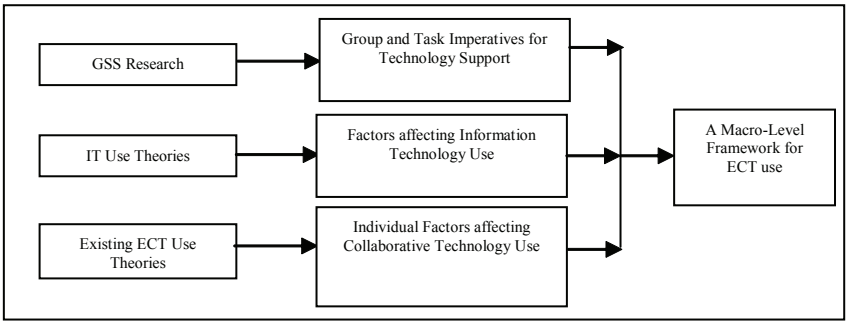
BACKGROUND

Researchers have argued that adoption and use of communication technologies arise from changes in the organization itself. Three perspectives have often been used to highlight this. The first is the technological perspective which views technology as an enabler of organizational forms; the second is the organizational perspective which views technology as being designed to fit organizational structures and forms while the third perspective is an "emergent perspective" which views technologies as "occasions" for structuring (Dutton, 1999). In all these three perspectives, adoption and use of technology is subsumed.

The organizational perspective involves development of integrative frameworks which encompass various factors which help design the "fit" between the organization and the technology. Such integrating frameworks in research entail knitting together varied sets of variables which represent or manifest the same underlying or superjacent construct (Gladstein, 1984). This is mainly due to a diversity of perspectives and standpoints assumed by different researchers.

Current theories which have primarily focused on groups and teams in laboratory settings may not adequately explain behavior seen in complex, interdependent task and technology settings in organizations. Some authors have pointed out this inadequacy

Figure 1. Background



of current theory in the area (Gallivan, 2001; Van den Hooff, Groot, de Jonge, 2005). Among the research issues suggested by many GDSS researchers and authors (e.g., Dennis, Nunamaker, & Vogel, 1990; DeSanctis & Gallupe, 1985; Gray & Mandviwalla, 1999), "an integrated framework for…understanding field use of GSS" has been highlighted as an essential direction of research.

IT Use Theories

In order to be able to understand use of e-collaboration technologies, one can essentially draw upon theories of information technology adoption and use in organizations. Early IT use research, till around the 1980s has dominantly focused on motivation and perceptions regarding the technology and its potential as a dominant factor in influencing why and how people use IT (see, e.g., Robey, 1979; Trice & Treacy 1986). With the coming of a simple yet presumably powerful technology acceptance model (TAM) in the mid 1980s (Davis, 1989), the shift to technology characteristics and attitudinal effects of perceptions gained predominance (see, e.g., Adams, Nelson, & Todd, 1992; Igbaria, Guimaraes, & Davis, 1995; Viswanath & Davis, 2000). The onset of computer networks in early 1990s and their active use in organizations forced IS researchers to give more importance to the overall organizational environment, the task related factors and the IT management issues. The 1990s and beyond also saw the use of multilevel constructs-based theories attempting to explain technology use. For example, Venkatesh, Morris, Davis, and Davis (2003) presented a unified view of user acceptance of IT by developing a theory using performance expectancy, effort expectancy, social influence and facilitating conditions as predictors of behavioral intention and actual use. They also included gender, age, experience and voluntariness to use as moderators. A similar progress line can also be drawn for research in groupware and ECT use, though the same level of maturity is yet to be attained.

Determinants of ECT Use

Drawing upon the IT use theories, IS researchers have examined various factors which influence use of e-collaboration technologies including task characteristics (Pinsonneault & Kraemer, 1990; Maznevski & Chudoba, 2000), accessibility (Rice & Shook, 1988; Lou & Scamell, 1996), top management support, awareness of the potential and other technology characteristics such as complexity, group supportability (Sarker et al., 2005), to name a few.

Van den Hooff et al. (2005) found, after a meta-analysis and a test of various theories on use of communication technologies, that use of electronic mail is determined by a combination of medium characteristics, individual user characteristics, users' social environment, and task characteristics.

The dominant measures of medium characteristics have often been the richness of the medium and its appropriateness to the task to be performed. Some researchers have argued that even low rich media such as e-mail may be used quite frequently for managerial tasks (Markus, 1994). Some others have argued that richer media may not necessarily lead to better performance in more equivocal tasks (Dennis & Kinney, 1998; Suh, 1999).

Another factor which has been given considerable importance in the literature on e-collaboration tech-