A Diffusion–Based Investigation into the Use of Lotus Domino Discussion Databases

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INTRODUCTION

Some information and communication technologies (ICT) that support groups have become tightly engrained in the fabric of organizational life, but others have not been as widely adopted (Orlikowski, 1993). This is true of both businesses and educational institutions. For example, many professors and students regularly interact through e-mail. In contrast, groupware systems are not as widely used.

In this article, we present research that uses diffusion of innovation (DOI) theory (Rogers, 1995) as the lens through which to study factors that impact intentions to use a groupware application in a higher education setting. This research investigates the following research question: *Are adopters' perceptions of the characteristics of groupware technology related to their intentions to use the technology?*

Organizations are increasingly making use of ICT to enable distance learning for their employees and, in some cases, customers (Dick, Case, Ruhlman, Van Slyke, & Winston, 2006). Furthermore, numerous academic institutions are implementing and supporting collaborative technologies to support student learning. For instance, Cordon, Anaya, Gonzalez, and Pinzon (2007) report on implementation of a virtual learning center to support learning of 4,000 students in Spain. Leung and Li (2006) describe efforts to create an e-learning environment in Hong Kong. High student dropout rates and low student satisfaction with e-learning remain major drawbacks in such implementations. Despite the presence of online discussion boards, sometimes students feel that there is little interaction in Web-based learning (Chatterjea, 2004). Avoiding failure in distance learning efforts requires better understanding of e-learners and their perception of ICT-based learning technologies.

BACKGROUND

Groupware technology is designed to facilitate the work of groups. This technology may be used to communicate, cooperate, coordinate, solve problems, compete, or negotiate. While traditional technologies such as the telephone qualify as groupware, the term is ordinarily used to refer to a specific class of technologies relying on modern computer networks, such as e-mail, newsgroups, videophones, or chat.

Figure 1. Groupware classification

	Same Time "Synchronous"	Different Time "Asynchronous"
Same Place "Co-Located"	Group decision support systems, voting, presentation support	Shared computers
Different Place "Distance"	Videophones, chat	Discussions, e-mail, workflow

Groupware technologies are typically categorized along two primary dimensions, time and place (Johansen, 1988), as shown in Figure 1. In this study, we investigate Lotus Domino discussion database (DDB), an asynchronous groupware product designed to be used by users "any time and any place."

The DDB is one of the Lotus Notes groupware applications made available to Web browsers via the Domino HTTP server technology. One may think of a DDB as an informal meeting place where the members of a workgroup can share ideas and comments. Like a physical meeting, each member of the workgroup "listens" to what others have to say, and can voice his or her own opinion.

Users have the ability to simply browse through discussion topics and responses contributed by others. This is particularly useful for new workgroup members who need to become oriented to important issues regarding the group. The history of any discussion is preserved in the discussion database and is presented as a discussion thread. Figure 2 illustrates a threaded discussion.

In a threaded discussion, users can either respond to an existing discussion thread or create a new discussion thread by posting a new topic. Posted items can also be edited and deleted by the author. Among the most important benefits of such groupware systems is to extend learning beyond the classroom (Day, Lou, & Van Slyke, 2004). Discussion databases can expand learning between students and faculty, and between students themselves by encouraging interaction and reflection on a topic.

An additional benefit comes from the fact that online interactive discussions may promote higher-order learning. For example, online debates often require synthesis of knowledge, which represents higher-order learning (Hazzari, 2004). In asynchronous online discussions, students have more time to reflect and synthesize their knowledge; there is less time pressure to respond quickly than there would be in a classroom setting. In addition, higher levels of certain cognitive processes may occur with online learning than with traditional classroom interactions (Heckman & Annabi, 2006).

MAIN FOCUS OF THE CHAPTER

DOI theory serves as the theoretical basis for this study. DOI theory is concerned with how the use of an innovation spreads throughout a social system (Mahajan, Mueller, & Bass, 1990). Diffusion theory has been applied to a wide range of technologies, including information and communication technologies such as groupware.

An often studied area related to innovation adoption is the impact of adopters' perceptions of the characteristics of an innovation on its adoption (Gatignon & Robertson, 1985; Lancaster & Taylor, 1986; Rogers, 1995). It is important to note that it is the potential adopters' *perceptions* of these characteristics rather than an expert's objective assessment of how an innovation rates on these characteristics

Figure 2. Discussion thread in a Domino discussion database

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