



# The Impact of Perceived Innovation Characteristics on Intention to Use Groupware

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*Information technologies that support groups of individuals have become increasingly visible. While some of these, such as electronic mail, have become almost ubiquitous in many organizations, other groupware applications have not enjoyed similar acceptance. This study uses diffusion of innovation theory to investigate factors that may influence intentions to use a specific groupware application, Lotus Domino discussion databases. Findings indicate that perceptions of relative advantage, complexity, compatibility and result demonstrability are significantly related to intentions to use Domino discussion databases. There was not a significant relationship between intentions to use and perceived trialability, visibility, or voluntariness. Those interested in increasing the use of groupware technologies may find these results helpful in guiding their efforts.*

## INTRODUCTION

Although a number of groupware applications such as email have become an almost ubiquitous part of many organizations, other groupware applications have not been as universally adopted (Orlikowski, 1993). This phenomenon is not only exhibited in business organizations, but also extends to educational institutions. Anecdotal evidence indicates that many professors and students now interact via email on a regular basis, while groupware systems have not been as widely adopted (Orlikowski, 1993). Research aimed at increasing our understanding of the diffusion and adoption of various groupware technologies represents an important direction for groupware research (Nunamaker, 1997).

The research reported in this paper represents an attempt to use a diffusion of innovation perspective (Rogers, 1995) to understand factors that may impact intentions to use a groupware technology in an educational environment. Specifically, this paper investigates the following research question:

Are adopters' perceptions of the characteristics of groupware technology related to their intentions to use the technology?

The answer to this question holds implications for practitioners as well as researchers. Research

has been called for to investigate the applicability of diffusion of innovation theories to interactive communication technologies such as groupware (Rogers, 1991). Practitioners who wish to use groupware in an educational setting might use the findings of this research to increase participants' use of groupware technologies.

## DOMINO GROUP SUPPORT SYSTEM

Groupware is technology 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 email, newsgroups, videophones, or chat.

Groupware technologies are typically categorized along two primary dimensions, time and place (Johansen, 1988), as

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, email, workflow

shown in Figure 1. Based on the time dimension of Figure 1, users of the groupware can work together at the same time or different times. On the other hand, the place dimension indicates that groupware users can work together in the same place or in different places.

In this study, the groupware investigated was the Lotus Domino discussion database, an asynchronous groupware product designed to be used by users “any time and any place.” Since there is also no requirement for users to be co-located, the technology falls into the lower right-hand portion of the grid in Figure 1.

The Domino discussion database is one of the Lotus Notes groupware applications made available to Web browsers via the Domino HTTP server technology. One may think of a Domino discussion database 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. However, unlike a physical meeting, the participants do not have to be in the same place at the same time to share information. People can participate when it is convenient for them to do so.

Users can access Domino discussion databases and participate in group discussions directly from the Internet using a Web browser. One advantage of Domino is that users no longer need special Notes client software in order to participate in group discussions. If they have access to the Web and a Web browser, they can access the discussion database.

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, browser users can either respond to an existing discussion thread or create a new discussion thread by posting a new topic in a Domino discussion database. Posted items can also be edited and deleted by the author just as with the standard Notes client.

## RESEARCH MODEL

Diffusion of innovation theory serves as the theoretical basis for this study. Diffusion of innovation 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.

The Technology Acceptance Model (Davis, 1989) is an alternative, but related, perspective on the acceptance and adoption of technology. While

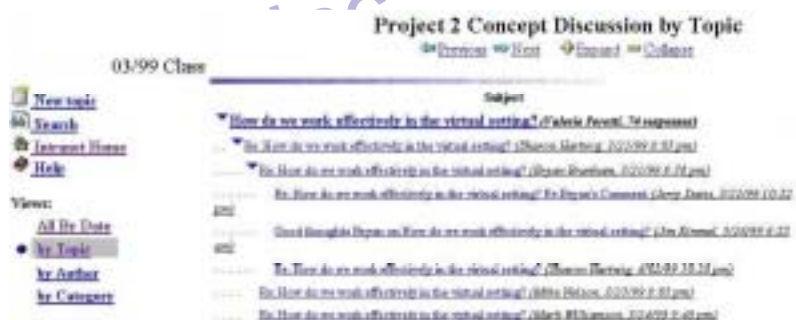
the Technology Acceptance Model (TAM) has added to the field’s knowledge of the factors that lead individuals to use information systems, components of the model are conceptually similar to constructs considered in diffusion theory (Moore & Benbasat, 1991). Diffusion theory also includes a number of additional factors that are thought to influence adoption and use intentions. Because of this additional richness and its wide acceptance, diffusion of innovation theory is used as the theoretical basis for this investigation.

An often studied area related to innovation adoption is the impact of adopter 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 that impacts the diffusion rate (Lancaster & Taylor, 1986; Rogers, 1995).

Rogers (1995) lists five perceived characteristics of an innovation that can help to explain its adoption or rejection: 1) relative advantage, 2) compatibility, 3) complexity, 4) trialability, and 5) observability. Others have proposed characteristics that may influence adoption, including perceived usefulness and perceived ease of use (Davis, 1989), which are conceptually similar to relative advantage and complexity (Moore & Benbasat, 1991). Other constructs of interest to this study include voluntariness, result demonstrability, and visibility. Table 1 gives definitions for the characteristics included in this study. In addition, the table provides references for both conceptual and empirical studies related to each construct. Interested readers may wish to consult these articles for additional information on these perceived innovation characteristics.

Many other characteristics of innovations have been studied. However, many of these are specific to the innovation being investigated or have not been widely studied. For purposes of this study, seven constructs seem to be the most appropriate to include: (a) relative advantage, (b) complexity, (c) compatibility, (d) result demonstrability, (e) visibility, (f) trialability, and (g) voluntariness. Relative advantage, complexity, compatibility and trialability are included because

Figure 2: Discussion Thread in a Domino Discussion Database



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