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COLLABORATIVE ELECTRONIC MEDIA USAGE FOR INFORMATION SHARING: TECHNOLOGY COMPETENCE AND SOCIAL TIES

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Abstract

The advance in collaborative communication media has allowed people to communicate and exchange information. The success of collaborative communication technologies depends upon how people use them. This paper develops a theoretical extension on individuals' beliefs and intentions in the usage of collaborative electronic media. The paper addresses crucial factors that are related to predicting collaborative electronic media usage for information sharing: technology competence and social ties.

Introduction

The advance in collaborative communication media (i.e., electronic mail, electronic bulletin board, list servers, etc.) has allowed people to access, communicate, and share information across time and place in the absence of acquaintance, physical proximity, or history of prior relationship (Constant et al. 1996; Kettinger and Grover 1997). Researchers recognize information sharing as a key element in today's organizations (Constant et al. 1994; Davenport and Prusak 1998; Jarvenpaa and Staples 2000). The success of communication technologies for information sharing depends upon how people use them (Constant et al. 1994).

Previous studies have empirically investigated the usage of collaborative communication media and its determinants (Kettinger and Grover 1997; Rafaeli and LaRose 1993; Sproull and Kiesler 1986; Steinfield 1985, 1986). Most studies have examined different factors that have influenced purposes of media usage such as task-related and social-related use. However, few studies on collaborative communication media have examined which factors in media usage are related to individuals' beliefs and intentions.

The paper develops a theoretical extension on individuals' beliefs and intentions in the usage of collaborative electronic media. By making the research model more specific, we synthesize the TAM, technology competence, and social ties (Agarwal and Karahanna 2000; Davis 1989; Haythornthwaite and Wellman 1998; Marcolin et al. 2000; Pickering and King, 1995; Taylor and Todd 1995; Venkatesh and Davis 2000). The contributions of this study are threefold. First, this study provides a theoretical rationale for explaining an individuals' usage of collaborative media. Second, we identify personal and social factors on individuals' belief processes. Third, from a practical point of view, our model helps managers develop more effective communication systems. The following section presents the theoretical background of this study. Subsequently, the paper proposes a conceptual framework and provides propositions.

Theoretical Background

Technology Competence: Computer Self-Efficacy and Knowledge

Marcolin et al. (2000) argued that few studies have incorporated technology competence as a key factor in information technology usage regardless of its importance in effective use of information technology. User competence is defined as "the user's potential

to apply technology to its fullest possible extent so as to maximize performance of specific job tasks” (Marcolin et al. 2000, p. 38). Kraiger et al. (1993) proposed a framework of learning outcomes with three categories: cognitive outcomes, skill-based outcomes, and affective outcomes. Cognitive outcomes are related to declarative knowledge including verbal knowledge, knowledge organization, and cognitive strategy. Skill-based outcomes consist of procedural knowledge “associated with the move from verbal knowledge to compilation and automaticity” (Marcolin et al. 2000, p. 39). Affective outcomes include attitudes and motivations. Marcolin et al. (2000) exploited this framework to characterize user competence. They argued that cognitive outcomes are independent of affective outcomes and that operationalization of these two constructs should be independent.

Affective outcomes are based upon the self-efficacy theory. The self-efficacy theory has been used to provide insight to people’s behavior (Bandura, 1995). Self-efficacy is an important determinant of the individuals’ perception for formulating beliefs in the context of user acceptance of information technologies (Taylor and Todd 1995; Venkatesh and Davis 1996). Direct experience of using a particular system is a strong source of self-efficacy belief formation, which enhances control over the individual user’s behavior (Taylor and Todd 1995). We utilize computer self-efficacy, defined as a judgment of one’s capability to use collaborative electronic media (Compeau and Higgins 1995).

Two types of knowledge have been examined in prior computer training research: declarative (i.e., cognitive outcomes) and procedural (i.e., skill-based outcomes) knowledge (Galletta et al. 1995; Olfman and Bostrom 1991; Simon et al. 1996). Declarative knowledge contains background information about computers—what a computer is and how it works. Procedural knowledge presents specific knowledge about software commands and operations. Yi and Davis (2001) argued that a user’s decision to adopt a new system is related to the “skill to use it effectively” (i.e., declarative knowledge). In this study, knowledge refers to declarative knowledge that users possess regarding collaborative electronic media and how they work.

Social Ties

Zack and McKenney (1995) argued that, in the study of the effect of information technology usage related to group interaction, social context, such as culture, social norms, practices, and a group’s expectation, should be considered. Recent research of social science has invoked social capital to work with social context including the general problems of collective action (Gulati 1999; Hansen 1998; Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998; Uzzi 1997). Social capital can be viewed as social network and/or social structure (Burt 2000; Coleman 1988; Portes 1998). Social ties refer to the links that connect individuals with others through the frequency and types of communications among them (Pickering and King 1995). This study utilizes social ties (i.e., strong or weak ties) as one of the major factors in users’ adoption of collaborative electronic media, drawing upon the theory of “the strength of weak ties” proposed by Granovetter (1973). Weak ties are characterized by absent or infrequent contact, lack of emotional closeness, and no history of reciprocal services (Granovetter 1973; Constant et al. 1996).

Previous studies have examined the relationship between collaborative electronic media and social ties: exploitation of inter-organizational computer-mediated communication infrastructure (Pickering and King 1995); usefulness of electronic ties through broadcast messages (Constant et al., 1996); and electronic media usage for information exchange (Haythornthwaite and Wellman 1998).

In summary, although technology competence and social ties have been examined under a wide range of social science disciplines, relatively little attempt has been made to integrate both factors into users’ adoption of collaborative electronic media. The proposed framework attempts to incorporate technology competence and social ties as major factors of user acceptance of information technology in the context of information sharing.

Research Model

In order to establish an understanding of how users adopt collaborative electronic media for information sharing, we synthesize relevant theories that are presented in Figure 1. In Figure 1, the dotted line indicates a boundary of individual beliefs and intentions in the adoption of collaborative electronic media.

Past research has empirically found that both perceived ease of use and perceive usefulness influence behavioral intention through a direct effect as well as an indirect effect through perceive usefulness (Agarwal and Karahanna 2000; Mathieson 1991; Taylor and Todd 1995, Venkatesh and Davis 2000). Especially, Szajna (1996) argued that perceived usefulness significantly influences intention, but that perceived ease of use has an indirect effect on intention through perceived usefulness. Once perceived ease of use is reinforced, it positively and significantly influences perceived usefulness (Venkatesh 2000).

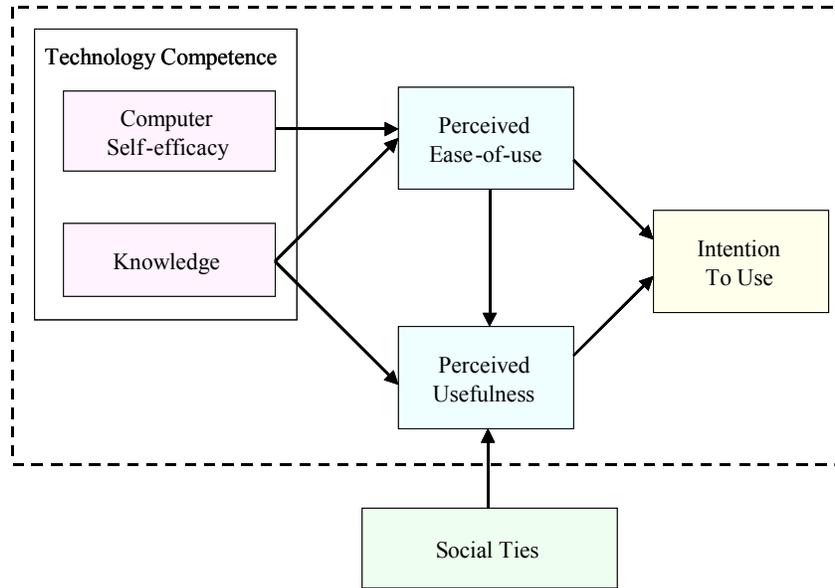


Figure 1. Framework of Users' Adoption of Collaborative Electronic Media

Computer self-efficacy is seen as an important predictor of information technology usage (Compeau et al., 1999). Davis (1989) argued that computer self-efficacy, defined as “judgment of how well one can execute courses of action required to deal with prospective situations” (p. 321), is similar to perceived ease of use. Mathieson (1991) addressed that “ease of use corresponds to the internal control factor of skill” (p. 179). Previous empirical evidence supports the finding that computer self-efficacy has a significant influence on perceived ease of use (Hong et al. 2001/02; Venkatesh, 2000; Venkatesh and Davis 1996). Therefore, we suggest:

P1: Computer self-efficacy positively influences perceived ease of use of collaborative electronic media.

Venkatesh (2000) argued that perceived ease of use is directly influenced by direct experience. From the end user’s perspective, once an individual’s knowledge about a particular technology is enhanced through direct experience, knowledge has an effect on perceived ease of use. Other studies have also found that users’ knowledge of a specific domain has a positive effect on perceived ease of use (Hong et al. 2001/02; Yi and Davis 2001). Chau (1996) considered long-term and near-term perceived usefulness in his model. He found that long-term perceived usefulness with the knowledge of a particular technology is an important determinant of the behavioral intention of using the technology. Montazemi et al. (1996) examined the selection of software package by specialists. They argued that end users felt a software package to be less useful because of lack of knowledge. Therefore, we propose:

P2: Knowledge of collaborative electronic media positively influences perceived ease of use of collaborative electronic media.

P3: Knowledge of collaborative electronic media has a positive effect on perceived usefulness of collaborative electronic media.

Haythornthwaite and Wellman (1998) found that, in strong ties, email-based communications were increased as supplements of face-to-face communications. Pickering and King (1995) argued that computer-mediated communication could play a role in maintaining strong ties, particularly work-related strong ties. However, Granovetter (1983) addressed that weak ties serve as links between strong tie networks. Weak ties are also beneficial since individuals can obtain useful information (e.g., through broadcast messages), which is unavailable from friends or colleagues (Constant et al. 1996; Kettinger and Grover 1997; Pickering and King 1995). Hence,

P4: Social ties are positively associated with perceived usefulness of collaborative electronic media.

Conclusion

This research facilitates theoretical investigations into intention to use collaborative electronic media. The contributions of this study are: 1) to identify technology competence as an important determinant of perceived ease of use and perceived usefulness of the system, and 2) to test whether social ties have significant effects on perceived usefulness of the system. For MIS practitioners, this study provides implications for developing effective collaborative communication systems.

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[Full references available upon request]