Chapter 14
Information Technology Adoption by Groups Across Time

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ABSTRACT

Today's technologies can support joint, but physically disparate work efforts. Some groups of profession-als that could benefit from using these technologies do not adopt them, while others use the technologies frequently. This study provides an in-depth examination of how and when one organization accepted technology in their decision-making efforts. The research examines actual usage of the technology rather than the less strong, but more common measure, intention to use technology. As a result, the paper has helped bridge the gap between what people intend to do and what they actually do, thereby providing both a stronger theoretical basis for the TAM model and some insights into the evolution of the TAM model. It examines an emerging extension to the TAM and provides evidence of the behavior of users when they must act as a group.

INTRODUCTION

Today's technology environment has introduced a productivity paradox, in that despite substantial investments in information technology, it has not been possible to demonstrate improved white collar productivity. Some researchers believe that the solution to technology's productivity paradox is to reduce the number of installed systems that are *under*utilized. [Sichel, 1997] In other words, the issue is not whether there is not enough or too much technology *available* in organizations today, but rather, the issue is that end-users are not embracing the technology that is available. Research from the last 15 years, completed by more than a hundred researchers, has considered how to

improve user acceptance through the application of the Technology Acceptance Model (TAM). (See, for example, Brown, Massey, Montoya-Weiss, and Burkman, 2002; Chau and Hu, 2002; Gefen, 2003; Gefen, Karahanna and Straub, 2003; Gefen and Straub, 2000; Karahanna, *et al.*, 1999; Karahanna and Straub, 1998; Keil *et al*, 1995; Lederer, Maupin, Sena and Zhuang, 2000; Ma and Liu, 2004; Morris and Dillon, 1997; Sussman, 2003; Szajna, 1986; Thompson, *et al.*, 1994; Venkatesh, 1999; Venkatesh, 2000; Venkatesh and Davis, 1994; Venkatesh and Davis, 2000) Based on the Theory of Reasoned Action, TAM suggests that one's acceptance of technology is driven by one's beliefs about the consequences of that usage. (Fischbein and Azjen, 1975) In particular, TAM predicts that users embrace a new technology when their perceptions of the ease of use, *and* the usefulness of the technology are positive. (Davis, 1989; Davis, *et al.*, 1989)

The first factor, *perceived ease of use*, represents the level of difficulty the user expects to have in integrating the tool into his or her routine. The second factor, *usefulness*, represents whether the technology will enhance his or her performance in completing a job. "Usefulness" then assumes not only that the system *will* enhance performance, but also that the user can perceive both the enhancement and its impact. (Davis, 1989) TAM suggests the user must be able to perceive *both* ease-of-use (PEOU) *and* usefulness (PU) before he or she will adopt new technology. (Davis, *et al.*, 1989)

While TAM has been validated by its creator and other researchers and applied studying a variety of technologies, there continues to be ambiguity about how to use the theory to improve user acceptance behavior. For example, it is not clear how the first factor, PEOU, plays a role in the decision. Several studies, such as Hendrickson and Collins (1996), Subramanian (1994), and Venkatesh and Davis (1996), suggest PEOU is a critical antecedent to user acceptance. However, other studies, such as those by Szajna (1996) and

Venkatesh (1999), suggest PEOU has no effect on adoption decisions, and still others show the impact is indirect through an intermediary impact of PU. (Davis, 1992; Keil, *et al.*, 1995; Morris and Dillon, 1997; Venkatesh and Davis, 1994) The contradictions from these various studies seem difficult to resolve as IT has experienced rapid growth in businesses as programs have become easier to master, and more consistent. Figure 1 illustrates the variety of ways PEOU has been shown to affect the intention to adopt technology.

However, Gefen and Straub's (2000) study shows that PEOU only affects the decision to use technology if the primary task of the system is directly associated with intrinsic IT characteristics. That is, PEOU only affects usage when the task for which the technology is being used is the same as the purpose of the technology (such as e-mail being used to inform, and the purpose of e-mail is to inform). Further, Venkatesh (2000) notes that individuals may be driven by their general beliefs about system usability (regardless of their experience with a particular system), computer anxiety, and perceptions of external control and that these factors might obscure the impact of PEOU. These roles are illustrated in Figure 2.

There is, however, no disagreement in the literature that the second factor, PU influences tool adoption and usage. The impact of this factor has been demonstrated in numerous studies and has not been questioned seriously by any study. Researchers now struggle to isolate the factors contributing to users' perceptions that a tool is useful. For example, Chau and Hu (2002) provide evidence that compatibility of the technology with users' routine operations of completing tasks will impact their perceptions of PU. In that study, the authors looked at physicians in Hong Kong (as examples of independent professionals) and their intentions to use telemedicine in their individual practices. They note that any independent professional becomes accustomed to a particular style of work and will evaluate usefulness of technology in light of its compatibility with that style of work.

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