Chapter 3.17
The Technology Acceptance Model:
A Meta-Analysis of Empirical Findings

Qingxiong Ma
Central Missiouri State University, USA

Liping Liu
University of Akron, USA

ABSTRACT

The technology acceptance model proposes that perceived ease of use and perceived usefulness predict the acceptance of information technology. Since its inception, the model has been tested with various applications in tens of studies and has become the most widely applied model of user acceptance and usage. Nevertheless, the reported findings on the model are mixed in terms of statistical significance, direction, and magnitude. In this study, we conducted a meta-analysis based on 26 selected empirical studies in order to synthesize the empirical evidence. The results suggest that both the correlation between usefulness and acceptance, and that between usefulness and ease of use are somewhat strong. However, the relationship between ease of use and acceptance is weak, and its significance does not pass the fail-safe test.

INTRODUCTION

Information technology (IT) acceptance or adoption has received considerable attention in the last decade. Several theoretical models have been proposed to explain end-users' acceptance behavior. Among them, the technology acceptance model (TAM) proposed by Davis (1989) is widely applied and empirically tested. There have been tens of empirical studies conducted on TAM since its inception. Compared with its competing models, TAM is believed to be more parsimonious, predictive, and robust (Venkatesh & Davis, 2000).

Despite the plethora of literature on TAM, the empirical tests have so far produced mixed and inconclusive results, which vary considerably in terms of statistical significance, direction, or magnitude. Although they are not uncommon in social sciences where human behavior is dif-

ficult and complex to explain, the mixed findings not only undermine the precision of TAM, but also complicate efforts for IT practitioners and academicians to identify the antecedents to user acceptance behavior.

The goal of this study is to understand to what extent the existing body of literature reflects substantial and cumulative validity of TAM. In particular, we synthesize the existing findings on TAM by conducting a meta-analysis. We hope that, by integrating existing empirical findings, we can better understand how TAM is applicable to different technologies as a whole. We will be able to examine the relationships between the constructs of TAM with a larger sample of subjects than any individual studies. The results of this study can, we hope, be used as a benchmark for future tests of TAM.

Beside its potential theoretical contributions, a meta-analysis on TAM is also significant to IT management practice. By understanding the substantive antecedents to user acceptance, IT managers can take more effective interventions to achieve greater technology acceptance or usage. As Robey and Markus (1998) and Benbasat and Zmud (1999) noted, IT management needs prescriptions. IT researchers should not only apply rigorous methodology best suited to their research objectives, but also produce relevant and consumable research for practitioners. There can be many possible ways for academic research to contribute to practice. Benbasat and Zmud (1999, p. 9) noted as a successful example, "IT research based on Theory of Reasoned Action and its extensions, such as the Theory of Planned Behavior, to the study of IT adoption, implementation, and use." They suggested that once a sizable body of literature exists regarding a phenomenon, "it does become possible to synthesize this literature" (Benbasat and Zmud, 1999, p. 9). Thus, they recommended that the "IS research community produce cumulative, theory-based, context rich bodies of research." In a sense, the current study answers this "rigor and relevance" research call.

The outline of this paper is as follows. We first review the literature on TAM and indicate major inconsistencies and discrepancies in the existing findings. Then, we describe how we collected and recorded the sample of empirical findings and report the results of our meta-analysis based on 26 selected empirical studies. Finally, we conclude this study by including a discussion on its limitations and some suggestions for future research.

LITERATURE REVIEW

The technology acceptance model (TAM), introduced by Davis (1986), is one of the most widely used models to explain user acceptance behavior. This model is grounded in social psychology theory in general and the Theory of Reasoned Action (TRA) in particular (Fishbein, & Azjen, 1975). TRA asserts that beliefs influence attitudes, which lead to intentions and therefore generate behavior. Correspondingly, Davis (1986, 1989) introduced the constructs in the original TAM (see Figure 1) as follows: perceived usefulness (PU), perceived ease of use (PEOU), attitude, and behavioral intention to use. Among the constructs, PU and PEOU form an end-user's beliefs on a technology and therefore predict his or her attitude toward the technology, which in turn predicts its acceptance.

Davis (1989) conducted numerous experiments to validate TAM by using PEOU and PU as two independent variables and system usage as the dependent variable. He found that PU was significantly correlated with both self-reported current usage and self-predicted future usage. PEOU was also significantly correlated with current usage and future usage. Overall, he found that PU had a significantly greater correlation with system usage than did PEOU. Further regression analysis suggested that PEOU might be an antecedent of