Chapter XXXVIII
Technology Acceptance Model

Mary McCord
Central Missouri State University, USA

BACKGROUND

The technology acceptance model (TAM) (Davis, 1989) measures perceived usefulness and perceived ease of use as predictors of a user's *intent* to use computer technology, and their *actual* usage on the job. The measure first appeared in 1989, in an *MIS Quarterly* article by Fred Davis, and in a coauthored article in *Management Science* (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). Extending the theory of reasoned action (Ajzen & Fishbein, 1980) to technology, perceived usefulness (U) is defined as "the degree to which a person believes a particular system would enhance his or her job performance." Perceived ease of use (EOU) is defined as "the degree to which a person believes that using a particular system would be free of effort." "Usage intentions" (BI) was measured through self-predicted future usage, and "user acceptance" was measured through self-reported current usage.

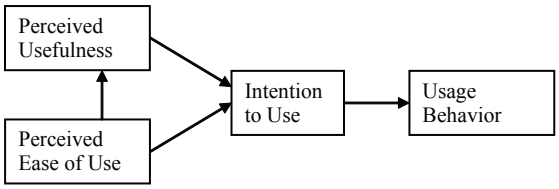
Although information technology is adopted to improve employee performance, these gains are often lost or diminished by users' unwilling to accept and use the information system. Davis wanted to understand why users rejected or accepted information technologies, to better predict, explain, and increase user acceptance. The TAM model has since become one of the most established models for predicting user acceptance.

The 12-item, Likert-type TAM instrument is considered one of the most robust and parsimonious models for predicting user acceptance. After some introduction to the new technology, respondents are given the short TAM questionnaire. The model assesses end-user acceptance of a *particular* technology, by regressing the construct PU and PEU on usage intentions (BI), and eventually, on user acceptance (actual usage). Acceptance is predicted via the strength of the coefficient regression. The instrument is self-report, and takes about 10 minutes to complete. The model is outlined next.

RELIABILITY

Extensive research supports the technology acceptance model's reliability and internal consistency. In the first year TAM was introduced, Davis was involved in two publications that outlined four studies that measured reliability and validity. In these first studies, the Cronbach alpha reliability coefficients for perceived usefulness ranged

Figure 1. TAM model



from 0.92-0.98, reliability for ease of use ranged 0.90-0.94, and reliability for (behavioral) intent to use ranged 0.84-0.90 (Davis, 1989; Davis et al., 1989). Intent to use did strongly correlate with actual usage, increasing from 0.35 to correlation of 0.63 by the one study's end.

VALIDITY

In the original TAM study from 1989, convergent and discriminant validity were strongly supported and tested using the multitrait-multimethod analysis (MTMM). Convergent validity measures the extent to which items comprising a scale behave as if they are measuring a common construct. Items that measure the same construct will be highly correlated. For perceived usefulness, the monotrait-heteromethod correlations were all (100%) significant to the .05 level. For ease of use, 95.6% of the monotrait-heteromethod correlations were significant; hence, convergent validity was supported. Discriminant validity measures the ability of an item to differentiate between two objects being measured. So, an item in the construct "perceived usefulness" should not correlate too highly with the same item when the technology being measured is different. In measuring discriminant validity, perceived usefulness (involving 1800 correlations/comparisons) was 100% confirmed. For ease of use, 97% of the comparisons were confirmed, representing a high level of discriminant validity (Davis, 1989).

In the original studies mentioned, TAM explained 47% - 51% of a user's intent to use. In subsequent studies, TAM has consistently predicted 0.40% of the variance in a user's intent or actual use of a particular technology. Perceived usefulness, especially, is a stable predictor of usage intentions, with standardized regression coefficients averaging around 0.6 (Venkatesh & Davis, 2000). Over time, ease of use (EOU) has less impact on usage (the technology is learned and ease of use is less important with experience). At time 1, EOU seems to have a direct effect on intent to use (BI), but when the test is repeated, EOU is entirely indirect via usefulness (U).

As stated, several researchers have replicated Davis's original studies, further validating his questionnaire instrument. The original technologies studied (Davis, 1989; Davis et al., 1989) were electronic mail, a text editor, word processing, and graphics software. TAM was extended to different technologies (electronic and voice mail, word processing, a spreadsheet, and a graphics package) (Adams, Nelson, & Todd, 1992; 1992) where it maintained reliability. Test-retest reliability was validated by Hendrickson, Massey, and Cronan (1993) using a database management system and a spreadsheet. Over time, user acceptance of several different technologies has been tested, and support for TAM's construct validity has accumulated.

ONLINE RESULTS

Perhaps because the instrument is so short, this author could find no examples of the use of TAM in an online Web survey. Even when the technology being assessed was Web usage, or online learning technology such as BlackBoard (Landry, Griffeth, & Hartman, 2006), the survey method of the pretest and posttest may not be online.

COMMENTARY

Extensions to the model (TAM2) (Venkatesh & Davis, 2000) explain perceived usefulness and