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# **Applying the Theory of Planned Behavior to Small Businesses and the Internet**

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## **Introduction**

Over the last decade, the use of information technology (IT) has dramatically increased in all businesses. Due to decreasing costs of hardware and software, and the availability of new technology, even the smallest businesses are able to afford some type of IT.

Attewell and Rule (1991) have stated that, in general, research dealing with just the largest thousand or so corporations creates a research bias because firm size can impact numerous activities and processes that are important to organizations. Further, since small businesses employ 54 percent of the private working population and they contribute 52 percent of all sales in the United States (Small Business Administration, 1996), it is imperative that MIS researchers consider small firms as well as large firms.

In terms of theory development, MIS researchers have suggested that intention models or behavioral decision theories from social psychology provide a potential foundation for research on user behavior (Swanson, 1982; Christie, 1981). Ajzen's (1991) Theory of Planned Behavior (TPB), an extension of Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), is a well-researched intention model that incorporates grounded concepts and principles and that has been successful in predicting behavior in a wide variety of domains. This theory should be especially useful for studying the adoption of a particular IT in smaller businesses because it assumes that a decision will be made with limited resources and influences from social expectations.

The purpose of this research is to determine what factors affect the decisions made in smaller businesses to adopt a specific IT. More specifically how well does the TPB explain decisions to adopt/acquire a home page on the World Wide Web (WWW)?

## **Methods**

For this research, small was defined as firms which employed between 20 and 500 employees. Initially, an elicitation study (Fishbein and Ajzen, 1975) was performed in order to identify salient consequences, referents and resources/obstacles. From the responses of the elicitation study, the questionnaire was developed. The questionnaire was pilot tested leading to changes in the wording of several questions. The final instrument was mailed to 1000 randomly selected small businesses throughout the United States. The sample included businesses from a variety of industries such as publishing, manufacturing, retailing, banking, legal, and financial services. A total of 156 questionnaires were returned. Sixty-four of the 156 businesses responding already had a home page on the WWW. Since the TPB is a model of intentions, only questionnaires from executives whose small businesses had not yet adopted a home page were candidates for the analysis. Five of the responses were not included because the firms had more than 500 employees; therefore, 87 questionnaires were used in the final analysis. The following hypotheses were tested in this study.

Hypotheses 1a-1c - In small businesses, intentions to have a home page on the WWW are a positive linear function of: (a) attitude toward adopting a home page, (b) subjective norm regarding the adoption of a home page, and (c) perceived control over adopting a home page.

Hypothesis 2: Attitude toward the adoption of a home page on the WWW is an additive function of behavioral beliefs ( $bb_i$ ) about the likelihood of evaluations ( $ev_i$ ) of those beliefs, with each belief multiplied by a discernment of the value of the evaluation.

Hypothesis 3: Subjective norm regarding the adoption of a home page on the WWW is an additive function of normative beliefs ( $nb_j$ ) about expectations of social referents, with each belief multiplied by a discernment concerning the firm's motivation to comply ( $mc_j$ ) with that social referent.

Hypothesis 4: Perceived control over the adoption of a home page on the WWW is an additive function of control beliefs ( $cb_j$ ) about the likelihood of expected barriers to adoption, with each belief multiplied by a discernment concerning the capacity of the firm's resources (perceived power ( $pp_j$ )) to overcome those barriers to adoption.

## Results

An analysis of job titles of those respondents participating in the study showed that presidents, CEOs, COOs, and vice presidents accounted for 54% of the usable questionnaires, IS managers and general managers accounted for 10% each, other responses accounted for 23%, and 3% of the responses were left blank.

Initial analysis of the measures for intention, attitude, subjective norm, and perceived behavioral control revealed a high correlation between subjective norm and intention ( $r=.74$ ,  $p<.01$ ). From a comparison of sixteen different studies done over a five year period, Ajzen (1991) reports the range of correlations between intention and subjective norm to fall between .14 and .70. The question for subjective norm was positioned on the instrument immediately following several questions for behavioral intention. Because there appears to be a great deal of common method variance between intention and subjective norm and the correlation is higher compared to other studies, it is reasonable to use a surrogate measure for subjective norm. The indirect measure of subjective norm, nbmc, was used as a surrogate. There is support for the use of the indirect measure nbmc as a surrogate measure for subjective norm in a study done by Fishbein (1979) predicting the intentions of young women to smoke or not smoke. Fishbein claims that "...since it was shown that be was a valid estimate of attitude, and since we also found that bm was a valid estimate of subjective norms, we are able to use these estimates in the prediction equation" (Fishbein, 1979, p. 97). Therefore, it is possible to predict intentions from behavioral beliefs, evaluations, normative beliefs, and motivations to comply. Because nbmc is an antecedent of subjective norm, it is further removed from intention in the theory. Therefore, using nbmc is a more conservative way to test for an additional explanation of variance than using the subjective norm measure.

Reliability estimates using Cronbach's alpha were calculated for measures of intention, attitude, and perceived behavioral control. These are .94, .88, and .73 respectively. All of these values are acceptable, and they possess high reliability according to Brown (1976).

Additionally, data regarding the respondent's influence over the adoption of a home page on the WWW was also collected. Since the TPB is a theory relating to intention, this question was asked to insure the respondent was involved in the decision making process regarding the adoption of a home page. This question was only appropriate for those respondents who did not currently have a home page. It asked "How much does your firm's decision to have a home page on the World Wide Web depend on your personal opinion? \_\_\_\_%" The average reported influence was 69%. If a respondent had answered 0% to this question, that observation would have been dropped from the analyses. However, none of the respondents answered 0%. Using the definition of a primary decision maker as one who has more than 50% influence over the decision to adopt a home page, 68% of the respondents were primary decision makers. Based on the job titles and the influence data, the assumptions of the theory had a reasonable fit to the adoption of a home page in small businesses.

Another way to determine instrument validity is by analyzing its construct validity. An iterated principal axes analysis with a promax rotation (Loehlin, 1992) was conducted for the attitude and perceived behavioral control measures. The analysis was not performed on the subjective norm measure because the nbmc surrogate was used; however, the normative belief component will be addressed in the following factor analysis. Since it was likely that the factors would be correlated (Ajzen, 1991), an oblique rotation was used. Based upon the parallel analysis criterion (Longman, Cota, Holden, and Fekken, 1989), two distinct factors emerged. The estimated correlation among the attitude and perceived behavioral control factors was  $r = .09$ . Table 1 contains the factor loadings for the two factors.

Another factor analysis was performed to examine the factor structure of the behavioral beliefs ( $bb_i$ ), the normative beliefs ( $nb_j$ ), and the control beliefs ( $cb_k$ ). This factor analysis provides evidence that these beliefs are perceptually distinct, or different conceptually in the minds of respondents. Three factors were detected among the belief factors, and they are shown in Table 2 (not included due to space limitation).

The estimated correlations among the belief factors ranged from  $r = -.19$  to  $.06$ . Factor 3 related to the control beliefs only, and factor 2 related primarily to the negative consequences of the behavioral beliefs. Factor 1 relates to the positive consequences of the behavioral beliefs as well as the normative beliefs. This division of the behavioral beliefs into two factors was also found by Harrison et al. (1997). The first factor, social consequences and social referents, indicates that some of the behavioral beliefs that are part of attitude are social consequences. Since the normative beliefs are a representation of the social referents, the commonality of the social aspect is a possible explanation for the loading of both positive behavioral beliefs and normative beliefs on this factor.

Hypotheses 1a-1c predict that intentions to have a home page on the WWW are a positive linear function of: (a) attitude toward adopting a home page, (b) subjective norm regarding the adoption of a home page, and (c) perceived control over adopting a home page. Hierarchical regression was used to test these hypotheses. Once again, nbmc was used as a surrogate measure of subjective norm. Table 3 shows the value for the coefficient as well as the change in the adjusted  $R^2$ .

Only part of the theory was supported in this study. The attitude and the surrogate measure for subjective norm each explained a unique portion of the variance, supporting Hypotheses 1a and 1b. However, the perceived behavioral control component was not significant, which fails to support Hypothesis 1c. The adjusted  $R^2$  value decreased when the perceived behavioral control component was added to the model. Since Hypotheses 1a and 1b were supported while Hypothesis 1c was not, this indicates support for the TRA which includes the attitude and subjective norm components only.

To test hypothesis 2, Evans (1991) and Ajzen (1991) recommend determining if there is a unique contribution of the sum of the multiplicative terms, in this case  $bb_i ev_i$ , to the model. There was support for Hypothesis 2. The multiplicative term,  $bb_i ev_i$ , did explain additional variance ( $R^2 = .03$ ,  $p < .01$ ) beyond the additive effects of the  $bb_i$  and  $ev_i$  terms. Due to the fact that a surrogate measure of subjective norm, nbmc, was used in this study, it is not possible to test hypothesis 3 as it was originally stated.

Hypothesis 4 predicts that perceived control over the strategic adoption of a home page on the WWW is an additive function of control beliefs ( $cb_j$ ) about the likelihood of expected barriers to adoption, with each belief multiplied by a perceived capacity of the firm's resources (perceived power ( $pp_j$ )) to overcome those barriers to adoption. Once again, a test to determine if there is a unique contribution of the sum of the multiplicative terms, in this case  $cb_j pp_j$ , was performed. Hypothesis 4 was not supported; the multiplicative term,  $cb_j pp_j$ , did not explain any additional variance. The model with the additive terms only was significant with a p-value of  $.10$  and a very small adjusted  $R^2$  of only  $.03$ . The lack of support for hypothesis 4 is consistent with findings regarding hypothesis 1c. Since the perceived behavioral control of the TPB did not explain any additional variance, it is not surprising that the cross-product term was not significant.

## Conclusion

Overall, strong support was found for the TRA as an explanation of the process by which executives in small firms decide to adopt a home page on the WWW. There was not support for the TPB, since the perceived behavioral control component was not significant.

The results of Hypothesis 1 indicate that the effect of the perceived obstacles on intentions does not impact the decision of the small business executive to adopt/acquire a home page on the WWW. It may be possible that the obstacles to the adoption/acquisition of a home page on the WWW are overshadowed by the attitude toward the adoption/acquisition of a home page as well as the social pressure to follow the lead of other businesses and adopt/acquire a home page.

The lack of perceived behavioral control being significant may also reflect the nature of the web page. Now, inexpensive off-the-shelf software and books are available to guide someone through the development of a home page on the WWW. In contrast, when home pages were originally introduced, they required more technical expertise to develop.

In prior research, neither Davis et al. (1989) nor Mathieson (1991) found significant influence of subjective norm on behavioral intention. They suggest that subjective norm may be influential in more realistic settings. In fact, that was the case in this study: subjective norm was significant in influencing behavioral intention. The perceived social expectations from those inside and outside the firm regarding adoption of a home page on the WWW were influential in predicting intention. Additionally, Taylor and Todd (1995) did find subjective norm to be significant even though the setting was a university computer resource center.

The results of Hypothesis 2 indicate that the multiplicative term did explain additional variance in the model. This finding was consistent with what the TPB predicts. The behavioral beliefs represent how likely or unlikely a consequence is while the evaluations represent how good or bad the small business executive feels about that consequence. Hypothesis 2 indicates that the behavioral beliefs should be multiplied by the evaluations in order to capture additional variance. This is comparable to multiplying probabilities by the respective utilities. Hypothesis 4 was not supported.

This field study has applied the TPB to decisions small business executives make regarding the adoption of a home page on the WWW. The results indicate that a small business executive's decision to adopt a home page on the WWW is a function of his/her attitude and subjective norm.

References and tables available upon request from C. Riemenschneider.