An Empirical Investigation to Validate the Technology Acceptance Model (TAM) in Explaining Intentions to Shop Online in Saudi Arabia Using SEM

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ABSTRACT

This study uses structural equation modeling (SEM) to investigate how theoretically applicable the technology acceptance model (TAM) is in an online shopping context in Riyadh, Saudi Arabia. Three hundred and twenty-two subjects participated in a structured questionnaire survey that was created using existing scales from prior TAM instruments, which were modified when appropriate. Our findings showed that our model is able to create an understanding that is better than the original online shopping intention model. Our results also showed that direct paths from perceived usefulness (PU) and perceived ease of use (PEOU) to online shopping intentions would help to improve the model's predictive power and would improve fit more than the original TAM model would. The model explains 81 percent of Saudi consumers' intentions to continue shopping online and can be generalized across Riyadh.

Keywords: Usefulness, Ease of use, Attitude,TAM, SEM, AMOS,KSA.

INTRODUCTION

There has been phenomenal growth in the Internet since it was commercialized in the early 1990s, and vast marketing opportunities have emerged during this time. Web sites serve as marketing channels with which to sell products from all over the world to all countries, including less-developed ones. This development has led researchers and organizations to attempt to explain how individual usage can be enhanced by acceptance of information technology (IT). In this area, Fred Davis developed the technology acceptance model (TAM) (Davis, 1986) to explain the ways in which users accept and use certain technologies. Davis et al. (1989) explained that the target of TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (p. 985).

The basis of TAM is the theory of reasoned action (TRA), a social psychology model that deals with the determinants of consciously intended behaviors. As Figure (1) shows, the TRA proscribes that the way in which a person performs a specific behavior is determined by that person's behavioral intention (BI) to act in that way, and BI is determined both by the person's attitude (A) and subjective norm (SN) regarding the behavior.

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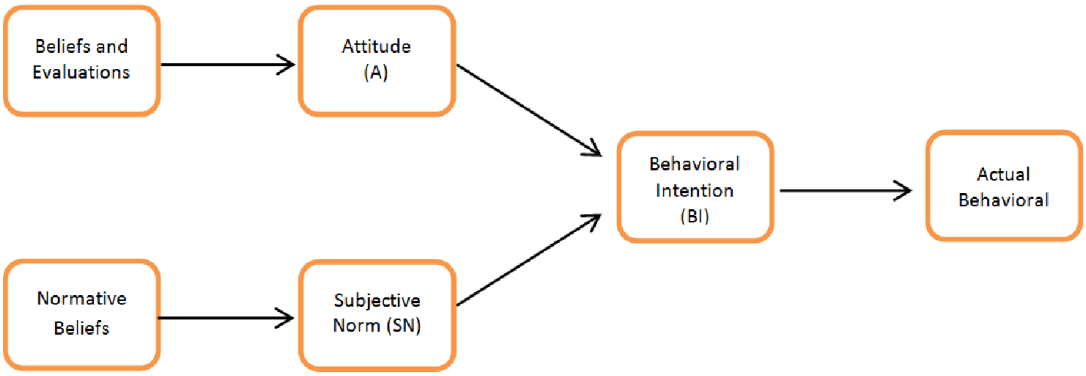

Figure 1. Theory of Reasoned Action (TRA) (Based on FishbeinandAjzen, 1975).

TRA provides a theoretical basis for TAM in terms of specifying the causal linkages that exist between two important sets of constructs. The first set is PU and PEOU, while the second is the user's attitude (A), behavioral intentions (BI), and actual computer usage behavior. PU has been defined, with regard to the user, as the "subjective probability that using a specific application system will increase his or her job performance within an organizational context" [Davis et al. (1989, p. 985]. PEOU is "the degree to which the user expects the target system to be free of effort" (p. 985). PU and PEOU both predict the attitude (or desire) of a user toward using the system. User's attitude and PU both influence the BI of an individual to use the system, while BI predicts the actual use of the system (see Figure 2).

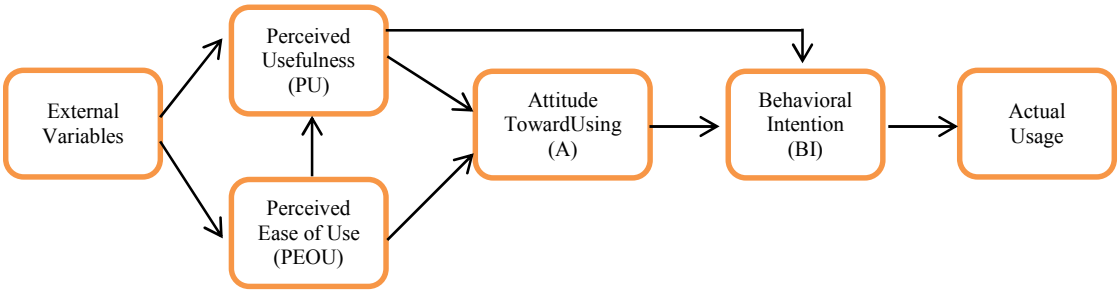

Figure 2. Technology Acceptance Model (TAM) (Based on Davis et al., 1989).

TAM is one of the most widely used IT models, partly because it is simple and easy to understand (King and He, 2006). However, several studies of online shopping have identified a need for closer examination of online shopping intentions in certain countries, largely due to cultural differences and the imperfection of technology acceptance relationships in various consumer markets (Yulihasri and Daud, 2011; Lim and Ting, 2012; Aggorowati, et al., 2012). Given the difficulty of measuring similarities and differences between people in different countries, it is also difficult to create and recommend rules that explain how users accept a system. Some studies have focused on online shopping in a global sense, others have called for closer investigation of online shopping intentions in developing

and less-developed countries. Because of the early stage of development that online shopping is at in Saudi Arabia, there is little knowledge about how consumers behave in terms of adopting online shopping and the factors by which this behavior is influenced. As Al-maghrabi and Dennis (2012) noted, "no previous research considers internet shopping in Saudi Arabia or, specifically, continuance intentions for online shopping in Saudi Arabia" (p. 362). The aim of the present study is to fill this gap by investigating the ways in which consumers form attitudes and intentions regarding online shopping. The research framework's underlying theoretical grounding is TAM, because it provides a valid basis with which to explain and predict consumers' intentions towards online shopping. There are two ways in which knowledge generated by this study will contribute to the literature. First, with regard to theory, the study's empirical investigation validates the TAM of Saudi consumers in relation to online shopping. The research confirmation minimizes the inaccuracy in measurement, which means that the research findings can be interpreted with greater confidence. Consequently, it is vital to have an instrument validation in order to replicate published research (Abbas et al., 2013). Second, with regard to practice, the study presents strategic directions and implications for online shopping development in Saudi Arabia.

Literature Review

Technology Acceptance Model (TAM)

Based on relevant literature and theoretical foundations, we employed the technology acceptance (TAM) model to investigate which technology acceptance factors influence consumers' online shopping adoption in the Saudi Arabian context. The TAM (Davis, 1989), which is based on the TRA (Ajzen, 1991; FishbeinandAjzen, 1975), is a powerful model with which to investigate how consumers accept and use information technology. In the present study, TAM was selected as the appropriate research model with which to explain online shopping adoption due to its ability to explain a considerable proportion of the variances between behavioral intentions and actual behaviors; this ability is derived mainly from studies of purchases of technology-related products (Hanque, et al., 2006; King and He, 2006). TAM suggests that perceptions or beliefs regarding an innovation are instrumental when developing attitudes that will lead to system utilization behavior (Davis, 1989). TAM also postulates that actual use of the system is determined by a user's behavioral intention to use, which is influenced by the user's attitudes regarding use. Although the original idea with TAM was to model how information systems are adopted in the workplace (Davis, 1989), two dimensions that consumer behavior scholars have identified as being particularly relevant for online shopping are perceived ease of use and perceived usefulness (Huang, 2008). As Figure (3) shows, the research model for the present study predicted the following relationships.

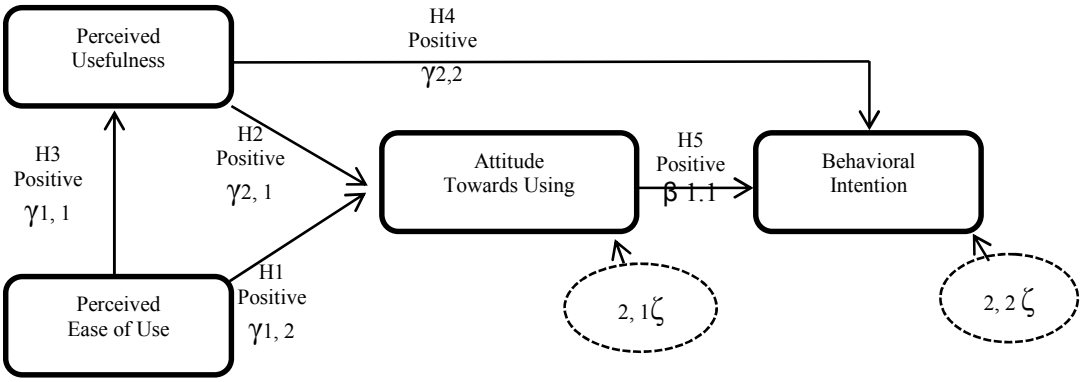

Figure 3: Research Hypotheses Model

According to TAM, PEOU has a significant effect on the acceptance or non-acceptance of a particular technology (Davis, et al., 1989). PEOU has been defined as the concentration of efforts, both physical and mental, that a user would expect to receive when considering whether to use a particular technology; in other words, it is the degree to which the technology would require effort from the user (Davis, 1989). According to Buton-Jones and Hubona (2005), the ease with which a user can learn and become skillful at using pervasive technologies, including online shopping technologies and interfaces, can determine the ease of use of a technology. Selamat et al. (2009) further noted that users are more likely to accept a technology that they perceive as being easier to use than a more complex technology, which will have a slower rate of adoption. Lim and Ting (2012) supported this claim, concluding that an easy-to-use system often requires less effort from users, which increases the likelihood that this technology will be adopted and used. Other researchers have found that perceived ease of use influences consumers' online shopping attitudes positively (Yulihasri and Daud, 2011; Aboelmaged and Gebba (2013). Accordingly, we offer the following proposition:

H1 – *Perceived ease of use of online shopping has a positive impact on perceived attitudes of online shopping.*

Relationship between PEOU and PU

TAM indicates that ease of use will influence a technology's perceived usefulness. If users find a certain technology easy to use, they expect greater benefits from that technology in terms of performance enhancement. Researchers have validated this relationship in an online technology context (Aboelmaged and Gebba, 2013; Lim and Ting, 2012). The findings from those studies are in line with Heijden (2000), who suggested that if consumers find it easy to user an online shopping site, they will perceive online shopping in general as being more useful. Accordingly, we offer the following proposition:

H3: Consumers' perceived ease of use of online shopping will have a positive influence on their perceptions of the usefulness of online shopping.

Perceived Usefulness (PU)

In the TAM model, another key determinant of attitudes regarding use is perceived usefulness, or PU (Davis, et al., 1989), which has been defined as the degree to which a user feels that a technology will enhance his or her performance of a certain activity (Davis, 1989). Aboelmaged and Gebba (2013) argued that the success of a shopping activity, in a consumer's mind, was determined by the ability of the activity to

improve the consumer's shopping performance and shopping productivity, and, primarily, accomplish his or her shopping goals. This finding is in line with those of Barkhi et al. (2008), who suggested that consumers develop favorable attitudes and intentions toward products/services that the consumers believe offer sufficient attributes or benefits regarding a solution and negative attitudes toward those products/services that are inadequate. Based on this scenario, Lim and Ting (2012) suggested that consumers will perceive as useful those online shopping sites that provide functions to help consumers reach better shopping decisions. Childers et al. (2001) supported this argument, suggesting that consumers with favorable attitudes and positive intentions toward online shopping perceived online retailers as useful. Hence, we propose:

H2: *The perceived usefulness of online shopping has a positive impact on attitudes toward online shopping.*

H4: *The perceived usefulness of online shopping has a positive impact on behavioral intentions toward online shopping.*

Relationship between Attitude and Intention

Attitude is commonly recognized as a cause of intention (SukiandRamayah, 2010). Fishbein and Ajzen (1975) categorized attitude into two distinctive constructs: the attitude toward an object, and attitudes toward the particular behavior. The first of these constructs is referred to as an individual's evaluation of a specific object, while the latter indicates an individual's evaluation of a particular behavior. In this light, TAM adapts the latter construct's categorization of attitude as the conceptualized operationalization of attitude; in its adapted form, this construct applies to the mediating affective response that exists between a consumer's beliefs about usefulness and ease of use, and that consumer's intentions to use a particular target system (SukiandRamayah, 2010). In an online shopping context, an online store's website is the main point of contact between a consumer and the online store (Ahn, et al., 2004). Scholars have underlined the importance of understanding what users expect and feel with regard to the websites they use (Chen, et al., 2002; Suhand Han, 2002). According to Al-Rafee and Cronan (2006), attitude is the most significant construct in terms of influencing behavioral intention. According to Ahn et al. (2004), a consumer with a more positive attitude towards online shopping will have a greater intention of engaging in online shopping. Therefore, we posit:

H5: *Attitudes toward online shopping have a positive impact on intentions regarding online shopping.*

In addition to investigating the impact that independent variables have on dependent variables, we also study the proposed model's mediating effects. A user's attitude can mediate the impact that perceived ease of use has on a user's intentions to use, and is the mediator of the impact that perceived usefulness has on a user's intention to use. Therefore, we posit:

H6: *Attitudes toward online shopping are a mediator between perceived usefulness of online shopping and intentions regarding online shopping.*

H7: *Attitudes toward online shopping are a mediator between perceived ease of use of online shopping and intentions regarding online shopping.*

Methodology

We used a quantitative questionnaire to acquire empirical data relating to each of the TAM variables. Each scale had been used in previous MIS studies (the reported reliabilities – that is, the Cronbach's Alpha – for the scales exceeded 0.80). This instrument used

measurement scales that had been validated previously and taken directly from an earlier study on consumers' e-commerce adoption (Straub et al., 2004). We pilot-tested the on MIS graduates, who were asked to indicate, using a seven-point scale, whether they agreed or disagreed with the survey. Based on the results of the pilot tests and on advice from MIS professors, we then modified the wording of the items. We faced several challenges in this regard, especially related to the design of sampling procedures, given that females in Saudi Arabia cannot legally or socially be approached by male strangers in Saudi Arabia.

Sampling and Data Collection

The challenges mentioned above led us to use a convenience sample only for Saudi citizens during the first half of 2012; these citizens were chosen from the Saudi capital of Riyadh. This type of selection enabled us to include a range of citizens for the study who were culturally diverse.

We pilot-tested the measures in order to validate the questionnaire items and justify the objective of the study. The questionnaires were hand-delivered to the participants so as to elicit voluntary participation; there was no interviewer to ask questions or guide the respondents. The survey was distributed to the female subjects by female researchers. We conducted an initial screening process to ensure that all study participants had previous experience with online shopping.

The fact that the survey was conducted in Saudi Arabia made it necessary to have the questionnaire translated from English to Arabic and to ensure that both versions used equivalent language. Two bilingual Arabian (Arabic/English) lecturers at the Al Imam language center translated the questionnaire into Arabic. We employed the double-translation method to avoid misinterpretation or confusion and to ensure that the Arabic questionnaire adequately represented the English version upon which it was based (Hair et al., 2006). We advised participants that their participation was voluntary and that their responses would remain confidential and be analyzed at the aggregate level only. We obtained a total of 351 questionnaires from the fieldwork, 322 of which were usable.

We analyzed the data using AMOS version 14 and conducted a confirmatory factor analysis (CFA) on measurement and structural models. CFA specifies which indicators define each of the latent constructs (Hair et al., 2006). We used composite reliability analysis, measurement analysis, and direct indirect impact analysis (*mediating effect*) to test the fit for the competing model, hypothesized structural model, and comparison analysis (Abbas et al., 2013).

Results

A total of 338 respondents (96.2 percent of the overall response rate) responded fully to the questionnaire. We excluded a further 14 questionnaires from the analysis because those respondents did not complete a majority of the questionnaire sections. Consequently, we used a total of 324 questionnaires in the analysis. Two datasets were subsequently deleted because they had Mahalanobis (D2) values that were greater than the $\chi 2$ value ($\chi 2=86.37$; $n=41$, $p<0.001$), which left a final dataset for analysis of 322 responses; this represented a final total useable response rate of 91.7 percent. We considered the total number of usable responses (322) to be acceptable because the margin of error (accuracy) was ±5 percent and also because the confidence interval (CI) was 95 percent. A detailed description of the respondents' demographic statistics is presented in Table (1).

Table1. The Profile of Respondents (N=322)

Demographics Variables		Frequency	Valid Percent %
Gender	Male	192	59.6
	Female	130	40.4
Education Level	High school	86	26.7
	Bachelor Degree	174	54
	Master Degree	49	15.2
	Doctoral Degree	13	4.1
Age	18 – 25	0	0
	26 – 35	111	34.5
	36 – 45	104	32.2
	46 and above	107	33.3
Income	Less than 5000 SAR	0	0
	5000-less 10000 SAR	74	22.9
	10000-less 15000 SAR	129	40.0
	15000 SAR and over	119	37.1
Frequency of online shopping	Never	0	0
	Twice per year	96	29.8
	Monthly	117	36.3
	Weekly	109	33.9
	Daily	0	0

Exploratory Factor Analysis (EFA)

We used EFA to validate all constructs. For the independent variables, the eigenvalues was greater than one, and so was the dependent variable. It could be argued that the items used in the constructs were significant and were also suitable for further analysis of the study data. The latent factor loadings that needed to be observed were greater than the 0.35 recommended level, at the 5 percent significance level (Hair et al., 2006); see Table (2).

Table 2. Exploratory factor analysis (EFA)

Exo. and Endo. (Variables)	Exo. and Endo. (Variables)	Factor loading
Perceived Ease of Use	PEU1	0.875
	PEU2	0.753
	PEU3	0.744
	PEU4	0.719
Perceived Usefulness	PU1	0.765
	PU2	0.761
	PU3	0.695
	PU4	0.621
Attitude	AT1	0.811
	AT2	0.792
	AT3	0.714
	AT4	0.695
Behavioral intention	BI1	0.799
	BI2	0.783
	BI3	0.724
	BI4	0.708

The Kaiser-Meyer-Oklin value is 0.914, higher than the recommended 0.60 minimum. Bartlett's sphericity test was significant ($p<0.001$), which supports the factorability of the correlation matrix.

Reliability test

Having completed the EFA, we used Cronbach's alpha to evaluate internal consistency reliability in order to test uni-dimensionality. Each of the constructs shows Cronbach's alpha readings that are above 0.60 and are therefore acceptable (Nunnally, 1978). Although 0.70 is the accepted cut-off point (Hair et al., 2006), any value >0.60 is considered to be satisfactory (Hair et al., 2006; Nunnally, 1978). As Table 3 indicates, the research framework consists of two exogenous variables and two endogenous variables.

Table 3. Reliability analysis for each construct

Variable Name		No of Items	Mean (Std. Dev)	Cronbach Alpha	Composite Reliability
Endo 1	Perceived Ease of Use	4	3.831 (0.795)	0.828	0.913
Endo 2	Perceived Usefulness	4	4.098 (0.823)	0.742	0.819
Exo. 1	Attitude	4	3.954 (0.867)	0.840	0.940
Exo. 2	Behavioral intention	4	4.190 (1.182)	0.754	0.879

Normality

The above SEM shows that the data was distributed normally. Therefore, since the critical ratio is less than 1.96, we can consider a sample to be multivariate if it is normally distributed at the 5 percent significance level (Abbas et al., 2013); this indicates that the coefficient of multivariate kurtosis does not differ significantly from zero, which meets the assumption of data normality.

Confirmatory Factor Analysis (CFA)

Despite the good results produced by EFA, we made modifications under CFA to ensure that our hypothesized model matched the SEM assumptions. Although the items were statistically significant under EFA, they may be subject to certain modifications. The measurement model (which is a CFA model) indicates which relationships suggest the way in which the measured variables represent an indirectly measured construct (Hair et al. 2006). With AMOS 14.0, we used CFA to examine discriminant and convergent validity. We used SEM to further analyze the 16 items noted in the CFA. As Table 4 and 5 show, RMSEA and RMR are both well within the acceptability ranges that MacCallum et al. (1996) and Abbas et al. (2013) recommended. As noted above, Abbas et al. (2013) suggested that a RMSEA of less than 0.08 indicates a good fit and a reasonable error of approximation within the population. The measurement model's RMR shows that the model is a well-fitting one.

Table 4. Confirmatory factor analysis (CFA) of all measurement models

CFA Model	Items	CMIN/df	TLI	NFI	GFI	AGFI	CFI	REMSEA
Perceived Ease of Use	4	1.465	0.999	0.999	0.997	0.981	0.999	0.028
Perceived Usefulness	4	1.435	0.997	0.997	0.996	0.957	0.999	0.019
Attitude	4	1.332	0.999	0.998	0.997	0.986	0.999	0.024
Behavioral intention	4	1.040	0.999	0.999	0.997	0.978	0.999	0.031

Table 5. Confirmatory factor analysis (CFA) of the structured model (Goodness-Of-Fit indices)

Structured Model	df	CMIN	CMIN/df	TLI	NFI	GFI	AGFI	CFI	REMSEA
Measurement (Exogenous)	19	21.87	1.151	0.999	0.993	0.986	0.973	0.999	0.020
Measurement (Endogenous)	20	28.46	1.432	0.997	0.993	0.982	0.962	0.998	0.034
Structural Model	282	321.32	1.139	0.992	0.969	0.927	0.912	0.993	0.027

Hypothesized Model Analysis

We used AMOS 14.0 Graphics to run the structural model and to test the relationship between constructs that we had hypothesized. We employed maximum likelihood (ML) estimation to compare the structure coefficients between the latent variables. We based our examinations of the goodness-of-fit (GOF) indices' ML on the assumption that the observed variables were normally distributed. The data in the previous section adheres to this assumption. The hypothesized model in Figure 3 reveals a $\chi 2$ (chi-square) of 321.32, a degree of freedom of 282, and a *P*-value of 0.000 (which is not significant at the 0.050 level); these results indicate that, apart from the *P*-value, the model fits the data very well. However, the chi-square statistic's high sensitivity to the sample size means that other fit measures may be more appropriate. All of these other fit measures also indicate the model's GOF to the data based on Tables (6–12).

Table 6. CMIN (Goodness-Of-Fit indices)Hypothesized Model

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	66	321.32	282	0.058	1.139
Saturated model	406	0.000	0		
Structural model	16	14158.805	378	0.000	37.457

Table 7. RMR, GFI (Goodness-Of-Fit indices)Hypothesized Model

Model	RMR	GFI	AGFI	PGFI
Default model	0.059	0.927	0.912	0.785
Saturated model	0.000	1.000		
Structural model	1.931	0.087	0.020	0.081

Table 8. Baseline Comparisons (Goodness-Of-Fit indices)Hypothesized Model

Model	NFI Delta1	RFI rho1	IFI Delta 2	TLI rho2	CFI
Default model	0.969	0.972	0.999	0.992	0.999
Saturated model	1.000		1.000		1.000
Structural model	0.000	0.000	0.000	0.000	0.000

Table 9. Parsimony-Adjusted Measures Comparisons (Goodness-Of-Fit indices)Hypothesized Model

Model	PRATIO	PNFI	PCFI
Default model	0.897	0.874	0.896
Saturated model	0.000	0.000	0.000
Structural model	1.000	0.000	0.000

Table 10. NCP(Goodness-Of-Fit indices)Hypothesized Model

Model	NCP	LO 90	HI 90
Default model	16.460	0.000	65.569
Saturated model	0.000	0.000	0.000
Structural model	13780.805	13395.157	14172.789

Table 11. RMSEA (Goodness-Of-Fit indices)Hypothesized Model

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.027	0.000	0.023	1.000
Structural model	0.309	0.305	0.314	0.000

As shown in the above tables, all indices suggest that the model achieves a good level of overall fit.

Table 12. Hypothesized Model (Goodness-Of-Fit indices)

Measures		Fit Indices	Threshold Values
Absolute Fit Level	RMSEA	0.027	Less than 0.08
	GFI	0.927	0.90 and Above
	P- Value	0.000	P- Value ≥0.05
Incremental Fit Level	AGFI	0.912	0.90 and Above
	CFI	0.999	0.90 and Above
	TLI	0.992	0.90 and Above
	NFI	0.969	0.90 and Above
Parsimonious Fit Level	CMIN/df	1.139	Less than 2.0
	SMC (R^2)	0.720	Bigger better

Hypothesis Testing of Hypothesized Model

Abbas et al. (2013) stated that each parameter's un-standardized estimate contains regression weights (SE) and (CR), where estimation of the critical ratio (CR) is divided by SE. If the result is above +/-1.96, (Null hypothesis): CR is 0" is rejected. Table 13 shows SE and the CR of each parameter.

Table 13. Regression weight for hypotheses testing result (H. Model)

H.	Estimate	SE.	C.R.	P	HypothesisSupport
H1	0.818	0.053	15.396	***	Asserted
H2	0.258	0.030	8.667	***	Asserted
H3	0.358	0.037	9.792	***	Asserted
H4	0.222	0.051	4.317	***	Asserted
H5	0.226	0.042	5.337	***	Asserted

Mediating Effect of the Hypothesized Model

As seen in Table (14), when a variable/construct intervenes between two other related constructs, a mediating effect is created. We tested the mediating effects that attitude had in the relationship between PU/PEOU and intentions toward online shopping. Our results indicated that intention behavior toward online shopping does not act as a mediator between intentions to shop online and Exogenous, and it also has an insignificant indirect effect of 0.041, which does not support our hypothesized model (H6 and H7).

Table 14. Direct, Indirect, and Total Effects of Hypothesized Model

Endogenous Variable (Intention to online shopping)			
	Indirect effect	Direct effect	Total effect
PU	0.011	0.421**	0.432**
PEOU	0.044	0.509**	0.553**

Model Generating (MG)

According to Jöreskog and Sorbom (1993), while re-specification may be either theory- or data-driven, its ultimate objective is to identify a model that is substantively meaningful and also statistically well-fitting. The modification indices of perceived intentions to shop online suggest that a path be added from attitude to intention. The modified model, with standardized estimates, can be seen in Figure 3 below. The positive path coefficient for the adding path suggests that the level of intention for online shopping will be high if there is a positive attitude. This finding is logical and the advice to apply this modification meets the theoretical justification; therefore, we accepted the modification.

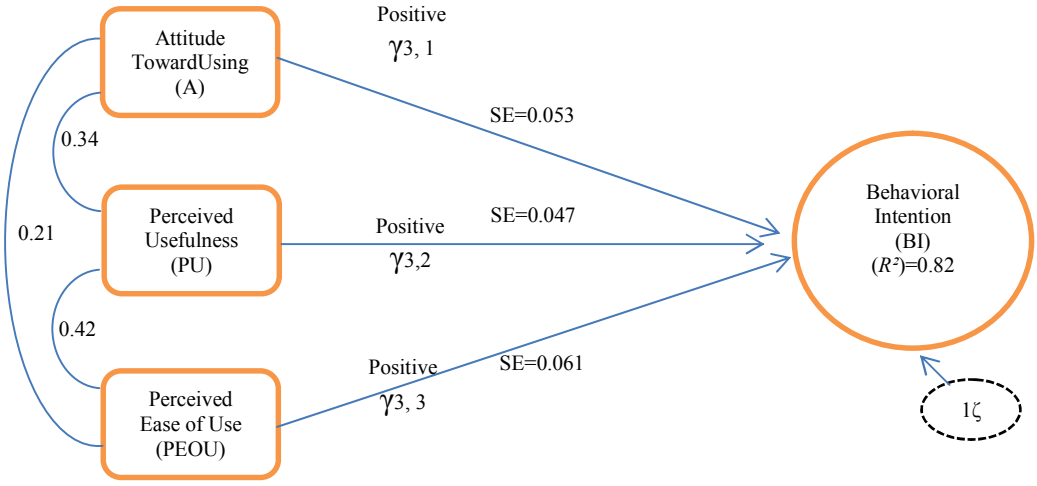

Figure 3. Structural Diagram for Model Generating

Goodness-Of-Fit indices of Model Generating MG

The TAM modification indices suggested that a direct path be added from PEOU and usefulness to intention, for which attitude is not significant mediator. The modified model, with standardized estimates, is presented in Figure (3). The fact that the path coefficient for the adding path is positive suggests that more positive PEOU and usefulness will lead to higher intentions to shop online. Consequently, we decided to accept the modification. As Figure (3) shows, the resulting models fit, with a chi-square of 327.70, 281 degrees of freedom, and a *P*-value of 0.259.

Comparison between Hypothesized and Model Generating

We used modification indices to develop a MG model with the intention of achieving a better-fitting and perhaps more parsimonious model. This new model

incudes a direct relationship between PU and intention, between EU and intention, and between attitude and intention. It is important to test this modification, both by direct and indirect effect, in order to determine the existence of the mediator effect between the relationships of attitude and intention. Our results support this hypothesis, but found no significant effect for this mediation. Hair et al. (2006) argued that it is usual to evaluate better-nested models using the difference between the Chi-square (CMIN/df). We used the following equation for computation:

$\Delta \chi^2 \Delta df = \chi^2 df (B) - \chi^2 df (A)$

$\Delta df = df (B) - df (A)$

The fact that the difference of the two χ^2 distributed values is itself χ^2 distributed enables us to test for statistical significance given the $\Delta \chi^2$ difference value and the difference in the degrees of freedom ($\Delta df = 1$, meaning the additional path in the MG model); a $\Delta \chi^2$ of 3.84 or greater would be significant at the 0.05 level.

$\Delta \chi^2 \Delta df = 321.32 - 327.70 = 6.38 (> 3.84)$

$\Delta df = 282 - 281 = 1$

Therefore, based on GOF indices, the MG model has a better fit and greater parsimony than the hypothesized model.

Conclusion and Implications

Theoretically, our results offer several contributions to the existing literature. We have provided insights into the factors that appear to affect online shopping intentions in Saudi Arabia and have also posited that attitude, PEOU, and PU all have direct effects on online shopping intentions. Somewhat surprisingly, we rejected the mediating effect of attitude between PEOU and online shopping intentions, and the mediating effect of attitude between PU and online shopping intentions. This indicates that PEOU and PU both have a direct effect on online shopping intentions.

This finding emphasizes the importance of developing and managing the PEOU and PU of users in order to ensure that online shopping intentions are successfully implemented. However, the finding is also inconsistent with Taylor and Todd's (1995) study, which indicated that PU and PEOU have indirect influences (via attitude) and direct influences on behavioral intentions toward system use. Similarly, previous studies of online technology adoption have suggested that PEOU and PU are good predictors of usage intention (Aboelmaged and Gebba, 2013). A user who feels that he or she is capable of using an online shopping application will demonstrate a behavioral intention to use the application. Consumers may continue to use an online shopping service that they feel is useful. The research results are also similar to those of Yulihasri and Daud (2011) and Aggorowati, et al. (2012), which suggested that PU has a significant direct influence on intentions toward system use. Those findings reflect the unpragmaticdimension of online shopping adoption decisions that are based on subjective and social acceptance. Our study represents a pioneering effort in terms of applying TAM to the emerging context of Saudi culture and by adding a path that goes directly from PEOU and PU to online shopping intentions; the theory's model fit better than models that do not have this path. Our generating model creates a much better understanding of internet shopping behavior among Saudi consumers in Saudi Arabia than TAM is able to. However, although our generating model is more effective than TAM, the latter can be used to demonstrate actual online shopping behavior. Moreover, only a small number of prior studies have adopted SEM as their methodological approach, and even fewer have used invariance analysis to verify behavioral online spending differences with samples obtained from Saudi Arabia. The present study addresses this knowledge gap.

Limitations and Future Research

This study has two main limitations. Firstly, because the study was conducted in Riyadh, the findings can only be generalized to the people of Riyadh and cannot be readily generalized to other cities in Saudi Arabia. Future works may wish to overcome this limitation by including other parts of the country. Secondly, our study used convenience sampling, based on the understanding that the research was self-financed and also due to time limitations. However, this drawback is only a minor one and we believe that the use of convenience sampling method contributes significantly, at least at the exploratory level. In future studies, the selection of various sampling methods will be important in order to advance the usefulness of the obtained findings and to generalize the findings.

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دراسة ميدانية للتحقق من صحة نموذج قبول التكنولوجيا (TAM) في تفسير رغبة المستهلك في التسوق عبر الإنترنت في المملكة العربية السعودية باستخدام المعادلات الهيكلية

*عباس نذير البرق**

ملخـــص

تهدف هذه الدارسة الى التحقق من مصداقية نظرية نموذج قبول التكنولوجيا – Technology Acceptance Model) وقياس مدي قابلية تطبيق هذه النظرية فى تفسير رغبة المستهلك في التسوق الى عينة عبر الانترنت فى الرياض – عاصمة المملكة العربية السعودية. ولتحقيق أهداف الدراسة، تم تصميم استبانه وجهت الى عينة الدراسة التي شملت 322 فردا. وقد تم تحليل البيانات التي جمعت من خلال الاستبانات باستخدام البرنامج التحليلي (AMOS – SEM). اظهرت نتائج هذه الدراسة إمكانية تطبيق هذه النظرية فى تفسير رغبة عينة الدراسة في التسوق عبر الانترنت، وذلك من خلال اضافة علاقة جديدة ومباشرة بين متغيرات البحث المتغيرة (perceived ease of use– مدى سهولة استخدام التكنولوجيا) و (perceived usefulness – مدى الفائدة من استخدام التكنولوجيا) على العامل المستقل (online shopping intention – الرغبة فى التسوق عبر الانترنت) دون الحاجة الى عامل وسيط (Attitude – سلوك المستهلك)، حيث بينت النتائج من خلال استخدام (AMOS- modification index) ان هذه العلاقة المباشرة فسرت بشكل اكبر ملاءمة هذه النظرية في تفسير رغبة المستهلك السعودي في التسوق عبر الانترنت بنسبة 81% (R^2=81) إضافة الى إمكانية تعميم هذه النتائج على افراد العينة كافة في المملكة العربية السعودية.

الكلمات الدالة: الاستفادة من التسوق، سهولة التسوق، السلوك الشرائي، الرغبة فى التسوق عبر الانترنت، نموذج المعادلات الهيكلية، اموس.

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