The Determinant of Online Purchasing Behaviour in Malaysia Based on Technology Acceptance Model (TAM)

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ABSTRACT

Internet online purchasing has been a growing phenomenon around the globe, especially among countries that have well-developed infrastructure for marketing activities over the Internet. Despite the world internet potential, the growth of actual number of internet users who purchased online has been low. Thus, our study intends to investigate the determinant of online purchasing behaviour in Malaysia based on Technology Acceptance Model (TAM). This study examines the relationships between perceived risks (PR), perceived usefulness (PU), and perceived ease of use (PEOU), toward attitude, intention and actual online purchasing (AOP). Data were collected from 212 internet users in Malaysia via questionnaires. The results show that all direct hypotheses are supported while the indirect hypotheses are not supported. The generating model achieved the highest SMC (R^2), explaining 53.9% variance in AOP. The results are discussed in the Malaysian online purchasing context.

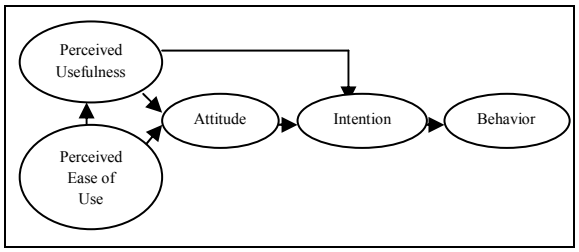
Keywords: TAM, Actual online purchasing; Intention (AOP); Intention; Attitude; Perceived risk (PR); Perceived usefulness (PU); Perceived ease of use (PEOU).

I INTRODUCTION

Online shopping has been a growing phenomenon in all four corners of the world, in particular amongst countries possessing highly developed infrastructure available for marketing activities through the internet (Delafrooz, Laily, & Khatibi, 2010). Elieo.com, (2009), reported that Malaysia is still in the infancy stage when it comes to online purchasing, which means that e-commerce is still relatively weak in Malaysia. Out of the total population of 28.1 million, the internet users as at August 2009 were about 9.4 million. Based on a recent survey by market analyst IDC showed that Malaysian Internet users made online transactions amounting to more than US$8mil (RM25.6mil) in 2009. In Asia Pacific, Malaysia is in seventh position in internet users, behind Taiwan, Australia, South Korea, India, Japan and China which is at the top position. However, on internet purchasing, only about 39 percent of Malaysians have bought online (Nielsen, 2008). Reasons cited for low online purchasing (Nielson, 2008) were security (Murphy, 1998) and risk (Tan, 1999). Moreover, there is limited empirical investigation to verify the antecedents of internet purchasing behaviour in Malaysia using underpinning theories of Technology Acceptance Model (TAM). Past studies have investigated the predictors of internet purchasing using TAM, mostly conducted in Western countries. Thus, our study intends to investigate the factors that determine internet purchasing behaviour in Malaysia based on TAM to ascertain their interdependence relationships empirically.

II LITERATURE REVIEW

This study utilizes an empirical underpinning i.e. TAM. TAM is an extension of Ajzen and Fishbein's Theory of Reasoned Action (TRA). It was developed by Fred Davis and Richard Bogozzi (Bagozzi, *et al.*, 1992; Davis, *et al.*, 1989). TAM proposes to explain the determinants of information technology end-users behaviour towards information technology (Saade, Nebebe & Tan, 2007). In TAM, Davis, *et al.,* (1989) proposes that the influence of external variables on attitude is mediated by PEOU and PU as shown at Figure 1. TAM also suggests that intention is directly related to actual usage behaviour (Davis, Bagozzi & Warshaw, 1989).



Source: Davis, et.al. (1989)

Figure 1. Technology Acceptance Model ((TAM)

Thus, for this study a research framework is developed as shown in Figure 2.

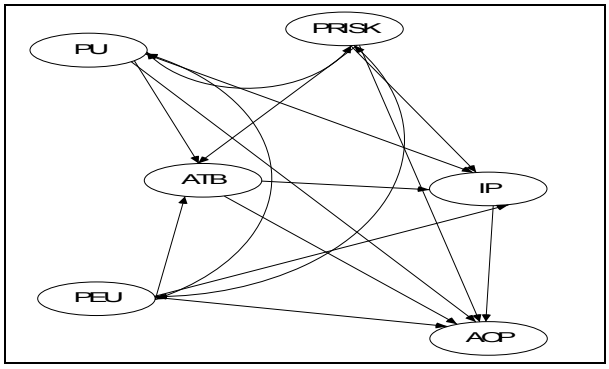


Figure 2. Research Framework

A **Relationship between Intention with AOP**

Intention is defined as using shopping medium related to an individual's attitude of using either print or Internet catalogues to purchase products (Vijayasarathy, 2000). Past studies had investigated the direct relationship between intention and AOP in the internet purchasing context (Abbasi, *et al*. 2011; Amoroso, & Husinger, 2009; Li & Huang, 2009; Tan, Yan, & Urquhart, 2009; Wen, 2008; Tarkiainen & Sundqvist, 2005, Ho, Jae & Pysarcik, 2004, Stoel & Lee, 2003, Kurnia & Chieu; George, 2002). All the above studies find that the relationship between intention and AOP are significant and positive. Hence, H1- Intention has a positive influence with AOP.

B. **Relationship of PR with AOP**

Cunningham (1967) defines PR as a consumer's perceptions of the uncertainty and adverse consequences associated with buying a product (or service). His, Chin & Hsiu, (2005), defines PR as the degree to which a user feels the uncertainty and adverse consequences of using an online application service in areas of financial risk, physical risk, functional risk, social risk, time-loss risk, opportunity-cost risk, and information risk. Past studies by Riquelme & Rios, (2010); Manzano, *et al*., (2009); Wen, (2008); Cunningham, *et al*. (2005); and Park & Jong, (2003), find that the relationship between PR with AOP is significant and negative. Hence, H2 - PR has a negative influence with AOP.

C. **Relationship of PU with AOP**

Davis, *et al.,* (1989), defines PU as the prospective user's subjective probability that his/her job performance within an organizational context would be increased as a result of using a specific application system. Past studies had investigated the relationship between PU with AOP (Abbasi, *et al*., 2011; Riquelme & Rios, (2010); Norazah, Ramayah & Norbayah, 2008; Fusilier & Durlbhji, 2005; Pikkarainen, *et al.*, 2004). All the studies conducted by those researchers are significant. Hence, H3 - PU has a positive influence with AOP.

D. **Relationship of PEOU with AOP**

PEU is defined by Davis, *et al.,* (1989), as the degree to which the prospective user expects the target system to be free of effort. Past studies conducted by Norazah, Ramayah & Norbayah, (2008); and Fusilier & Duralbhji, (2005), find that the relationship between PEOU and AOP is significant and positive. However, Pikkarainen *et al.*, (2004), find that the relationship of PEOU and online banking as not significant. Hence, H4- PEOU has a positive influence on AOP.

E. **Relationship of Attitude with AOP**

By definition, an attitude is an index of the degree to which a person likes or dislikes an object (Ajzen & Fishbein, 1980). An individual will hold a favorable attitude toward a given behaviour if he/she believes that the performance of the behaviour will lead to mostly positive outcomes. Several past studies have investigated the direct relationship between attitude and AOP in internet purchasing setting. (Amoroso & Husinger, 2009; George, 2004; Jayawardhena, 2004; and Shwu, 2003). All studies found that the relationships are significant and positive. Hence, H5 - Attitude has a positive influence with AOP.

F. **Relationship of PR with Intention**

Previous studies had investigated the direct relationship between PR and intention in the internet purchasing setting. It was found that the relationship was significant and positive (Broekhuizen & Huizingh, 2009; Amoroso & Husinger, 2009; Hsiu & Su, 2008; Wen, 2008; Celik, 2008). Hence, H6 - PR has a negative influence with intention.

G. **Relationship of PU with Intention**

Past studies find that there was positive relationship between PU and intention (Abbasi, *et al*., 2011; Amoroso & Husinger, 2009; Li & Huang, 2009; Celik, 2008; Yusniza, 2007; Ramayah & May, 2007; Hsi, Chin & Hsiu, 2005; and Kurnia & Chieu, 2003). Hence, H7 - PU has a positive influence with intention.

H. Relationship of PEOU with Intention

Past studies showed that the relationship between PEOU and intention was significant (Azizi & Javidani, 2010; Li & Huang, 2009; Hyun, Fiore & Kim, 2005; and Yu, Chieh & Ling, 2005). Hence, H8-PEOU has a positive influence with intention.

I. Relationship of Attitude with Intention

Past studies have investigated the direct relationship between attitude with intention in internet purchasing setting (Syed Alam, & Nazura, 2011; Azizi & Javidani, 2010; Kim & Forsythe, 2010; Amoroso & Husinger, 2009; Tan, Yan, & Urquhart, 2009; Alcarniz, *et al*. 2008; Wen, 2008; Celik, 2008; Yoo & Norton, 2007; Baker, Al-Gaftni & Hubana, 2007; Kim & Park, 2005; Lympeopoulus & Chainotakis, 2005; and Kurnia & Chieu, 2003). The relationship between attitude and intention is significant and positive. Hence, H9 - Attitude has a positive influence with intention.

J. Relationship of Perceived Risks with Attitude

Past studies showed that the relationship between PR and attitude was significant and positive (Wen, 2008; Krauter & Faullant, 2008; Celik, 2008; His, Chin & Hsiu, 2005; and Vijayasarathy & Jones, 2000). Hence, H10 - PR has a negative influence with attitude.

K. Relationship of PU with Attitude

Past studies found that the relationship between PU and attitude was significant and positive (Cho & Fiorito, 2009; Amoroso & Husinger, 2009; Alcarniz, *et al*., 2008; Celik, 2008; McKichnie, Wilklhoter & Ennew, 2006; and Lympeopoulus & Chainotakis, 2005, Kurnia & Chieu, 2003). Hence, H11-PU has a positive influence on attitude.

L. Relationship of PEOU with Attitude

PEU is defined by Davis, *et al.* (1989), as the degree to which the prospective user expects the target system to be free of effort. Past studies found that the relationship between PEOU and attitude was significant (Kim & Forsythe, 2010; Cho & Fiorito, 2009; Amoroso & Husinger, 2009; Alcarniz, *et al.,* 2008; Celik, 2008; McKichnie, Wilklhoter & Ennew, 2006; Lympeopoulus & Chainotakis, 2005; His, Chin & Hsiu, 2005; and Kurnia & Chieh, 2003). Hence, H12 - PEOU has a positive influence on attitude.

III RESEARCH METHODOLOGY

As proposed, the final hypothesized structural model for the study consists of three exogenous variables (PR, PU, and PEOU) and three endogenous variables (attitude, intention and AOP). Attitude and intention are hypothesized to act as mediators between relationships of exogenous and AOP.

A. Sampling and Instruments

A total of 500 questionnaires are distributed to internet users who are officers and executives of American International Assurance (AIA) in Malaysia. 290 questionnaires are duly returned, representing 58 percent of response rate. The measurement used for this study is based on that used by various studies. Measures of PR (4 items) by Laroche, Bergsen & Goutaland (2003), attitude (4 items), intention (4 items) and AOP (5 items) by Vijayasarathy (2002). Measures of PU (6 items) and PE0U (5 items) based on Davis's (1989) instruments. All questions use 6-point Likert interval scales measurement (1-strongly disagree and 6-strongly agree). There are also nine demographic questions included in the questionnaire such as gender, age, educational background, employment, marital status, frequency of purchasing through the internet, hours spent on online purchasing in a month, possession of a credit and average annual income.

B. Data Screening and Analysis

The 290 datasets are coded and saved into SPSS version 17 and analyzed using AMOS version 6.0. During the process of data screening for outliers, 78 datasets are deleted due to Mahalanobis (D2) values more than $\chi 2$value ($\chi 2$=74.75) leaving a final 212 datasets to be analysed. Several statistical validity tests and analysis are than conducted such as reliability test and composite reliability tests, validity tests using confirmatory factor analysis (CFA) for construct validity, discriminant validity for multicollinearity treatment, descriptive analysis, correlation and structural equation modelling analysis using AMOS 6.0 (SEM).

IV FINDING

A. Demographic Profile of Respondents

The respondents' age ranged from twenty-five to sixty-one years old. The majority (67.93%) of the internet users and buyers are below the age of 35 years. It is also found that 78.27% of the internet

users and purchasers are those with bachelor degrees. All the respondents possess credit cards and had used Internet before. It is found that only 37.59% had purchased goods using the Internet occasionally while 62.41% seldom purchased using the Internet. And, only 12.41% have spent more than five hours a month purchasing using the Internet and 82.59% used the Internet less than five hours a month.

B. Descriptive Analysis of Variables

The research framework consists of three exogenous and three endogenous variables (Table 1). Each construct shows Cronbach's Alpha readings of acceptable values above 0.6 (Nunnally, 1978), except for PR, PEOU. However, these variables are included in the subsequent analysis, that is, composite reliability. Since composite reliability calculated for PR is 0.812, PEOU is 0.653, so the readings are acceptable, thus conforming to Nunnally's standard.

Table 1. Descriptive Statistics of Variables

Constructs	No of Items	Cronbach Alpha	Composite Reliability
1. Attitude	4	0.853	0.819
2. Intention	4	0.704	0.692
3. AOP	5	0.815	0.746
4. PR	4	0.554	0.812
6. PU	6	0.751	0.744
7. PEOU	5	0.489	0.653
Total items	28		

C. Confirmatory Factor Analysis (CFA) Results

From the confirmatory factor analysis result, we observe that the factor loadings of all observed variables or items are adequate, which is above 0.50. The factor loadings or regression estimates of the latent to observed variable should be above 0.50 (Hair, et al., 2006). This indicates that all the constructs conform to the construct validity test. The remaining numbers of the items for each construct are as follows: attitude (3 items), intention (3 items), AOP (4 items), PR (4 items), PU (4 items), PEOU (4 items).

D. Discriminant Validity (AVE)

The result of calculated variance extracted (VE) support discriminate validity of constructs. Average variance extracted (AVE) is the average VE values of two construct. According to Fornell & Larcker, (1981), AVE should be more than the correlation squared of the two constructs to support discriminate validity. Each AVE value is found to be more than correlation square, thus discriminant validity is supported of multicollinearity is absent.

E. Goodness of Fit Indices

Confirmatory factor analysis was conducted on every construct and measurement models. All CFAs of constructs produced relatively good fit as indicated by the goodness of fit indices such as CMIN/df ratio (<2); p-value(>0.05); Goodness of Fit Index (GFI) of >.09; and root mean error of approximation (RMSEA) of values less than .08 (<.08).

The measurement model has a good fit with the data based on assessment criteria such as GFI, CFI, TLI, RMSEA (Bagozzi & Yi, 1988). Table 2 shows the goodness of fit of generated model is better compared to the hypothesized model.

Table 2. CFA of all Measurement and Structural Models (Goodness of Fit Indices)

CFA Models	Items	CMIN	df	CMIN/df	p-value	GFI	CFI	RMSEA
PR	4	3.971	2	1.985	.003	.991	.979	.068
PU	4	2.740	2	1.376	.254	.994	.994	.042
PEU	3	4.490	2	2.245	.106	.989	.982	.077
Att	4	10.957	2	5.479	.004	.975	.978	.146
Intent	4	1.334	2	.667	.513	.997	1.000	.000
AOP	4	10.482	2	5.241	.005	.974	.968	.142
TAM Hypo/ Model	28	705.972	335	2.107	.000	.802	.825	.072
TAM Gen/ model	12	42.553	39	1.091	.321	.969	.993	.021

F. Hypotheses Results

Since the hypothesized model does not achieved model fit (p<.000), hence, the explanation of the hypothesis result is based on TAM generating model (Figure 4). Table 3 demonstrates that hypotheses H1, H2, H3, H5, H11 and H12 are significant. However, H4, H6, H7, H8, H9 and H10 are not significant. The structural path result is depicted diagrammatically in Figure 4. It is also noted that the three exogenous variables (PR, PU and PEOU) jointly explained 31% variance in attitude. Then, attitude, PR, PU and PEOU jointly explained 9% variance in intention. Subsequently, intention, attitude, PR, PU and PEOU collectively explained 54% variance in AOP.

Table 3. Hypotheses Testing Result of TAM Generating Model

H	From	To	Est	SE	C.R	*p*-value	Hypothesis Support
1	Intent	AOP	-.271	.124	-2.174	**.030**	**Supported**
2	PR	AOP	.369	.151	2.441	**.015**	**Supported**
3	PU	AOP	.304	.152	1.997	**.046**	**Supported**
4	PEU	AOP	-.210	.140	-1.504	133	Not Supported
5	Att	AOP	.447	.141	3.163	**.002**	**Supported**
6	PR	Intent	.149	.138	1.074	.283	Not Supported
7	PU	Intent	-.072	.131	-.549	.583	Not Supported
8	PEU	Intent	.156	.137	1.143	.253	Not Supported
9	Att	Intent	-.068	.134	-.511	.610	Not Supported
10	PR	Att	-.089	.125	-.713	.476	Not Supported
11	PU	Att	.411	.137	2.994	**.003**	**Supported**
12	PEU	Att	.343	.118	2.899	**.004**	**Supported**

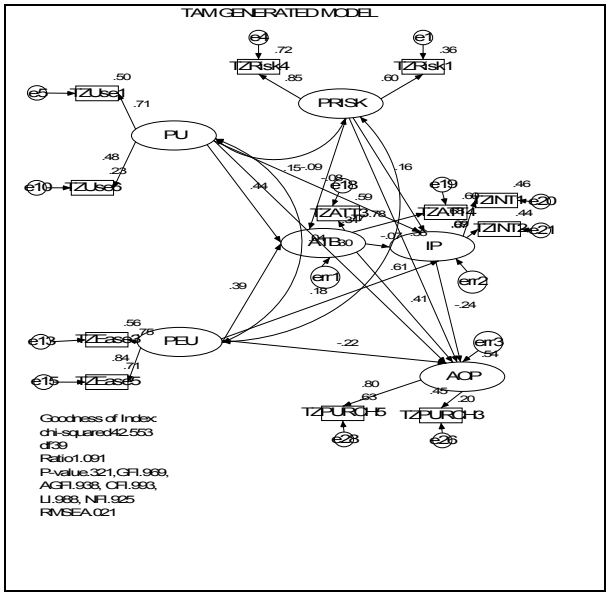


Figure 4. TAM Generating Model

Lastly, the SMC or the R^2 for AOP (54%) and intention (9%) and attitude (31%) shows the highest variance explained in the generating model.

V DISCUSSION

The study attempts to examine the goodness of fit of the hypothesized structural model of TAM. The TAM accomplished model fit and supports six direct effects. When all the four are present at the same time internet users tend to have the inclination to purchase direct rather than just thinking about it. This means that in most cases internet users are likely to purchase directly once they have the opportunity to be online. Purchasing is made mandatory when internet users need to commit by paying direct at the internet. Most internet users may not need to think once they want something. Another matter that is of concern is risk. The internet users need to be cautious to purchase online if the purchase is risky.

A. Recommendations for Future Research

Due to the aforesaid limitations, the following recommendations for future researches are suggested. First, since the data collected are majority from the respondents in one particular organization only, it is hoped that future studies are able to increase the level of accuracy to represent all the respondents from all states in Malaysia especially from both the states of Sabah and Sarawak. Additionally, the web firms should undertake to carry out more research and development on ways how to make their web sites easily accessible and products more attractive, pleasing to the eyes of the internet users so that they would purchase online in the future. Thus, if all the above proposals could be implemented, we believe the internet usage and online purchases could be improved tremendously in Malaysia.

B. Conclusion

This study aims to investigate the antecedents of a well-known behavioral model, namely, TAM. This study concludes that several direct paths are found to be significantly related to intention and AOP. Generally, the TAM is the best model to explain the internet purchase behavior compared to hypothesized model.

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