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Online Purchase Intention in B2C E-Commerce: An Empirical Study

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Abstract: Online purchase intention is one of the most important research areas in management information systems and marketing science. This study extends theory of planned behavior (TPB) by including six important antecedents to online purchase intention. This study is conducted with a survey of 234 college students who have online shopping experiences. The collected survey data is used to test each hypothesis developed by using SPSS18 and AMOS18 in the research model. The results of data analysis confirm perceived ease of use (PEOU), perceived risk, and trust are essential antecedents in determining online purchase intention through behavioral attitude and perceived behavioral control.

Keywords: Online purchase intention, PU, PEOU, Trust, perceived risk, TAM, TPB, B2C.

1. Introduction

As e-commerce has become an important marketing channel in business. Online shopping and services are important sales channels in business to customer (B2C) e-commerce. Studying online purchase intention has been one of the most important research areas in e-commerce during the past decade. The research of online purchase intention has been conducted in multiple disciplines including information systems, marketing, management science, psychology and social psychology, etc.

Many studies examined various antecedents to online purchase intention independently, most of them isolated a few major factors, usually between three and five factors, from others in one research model in order to achieve parsimony of research model. This study attempts to develop such a unified research model to study the effects of several major antecedent factors which are identified by prior studies on online purchase intention.

2. Theoretical Background

2.1 TAM

TAM was developed by Davis (1989) based on the theory of reasoned action (TRA) to explain computer usage behavior. The goal 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. TAM posits that the intention to use an information system is determined by perceived usefulness (PU) and perceived ease of use (PEOU). PU is defined as the degree to which a person believes that using a particular system would enhance his or her job performance while PEOU refers to the degree to which a person believes that using a particular system would be free of effort. TAM further postulates that the perceptions of the potential adopters of information systems in terms of usefulness and ease of use influence their attitude, which may generate

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behavioral intention (BI) to use a particular technology. Their behavioral intention will then lead to the actual usage (AU) (Ajzen 1985). In the study of online consumer research, TAM often plays a backbone in the research models and other theories or constructs are usually integrated with it.

2.2 TPB

TPB (Ajzen 1991) is a well-established general theory of social psychology. It asserts that specific salient beliefs influence given behavioral perceptions and subsequent actual behavior. TPB has been one of the most influential theories in explaining and predicting behavior and been shown to predict a wide range of behaviors (Sheppard et al. 1988).

TPB proposes that three types of beliefs impact three behavioral perceptions, respectively. Behavioral beliefs influence attitudes toward behavior, normative beliefs determines subjective norm, and control beliefs shape perceived behavioral control. In summary, attitude toward behavior, subjective norm, and perceived behavioral control altogether lead to the formation of a behavioral intention which in turn determines behavior. In general, the more favorable is the attitude and subjective norm and the greater the perceived behavioral control, the stronger an intention to perform the behavior. In the e-commerce context, many studies have successfully used TPB to study online purchase intention.

3. Research Model and Hypotheses

In our view, an integrated model is needed to combine both antecedents and consequents. As below, we proposed and evaluated a theoretical model of online purchase intention in B2C e-commerce (see Fig. 1).

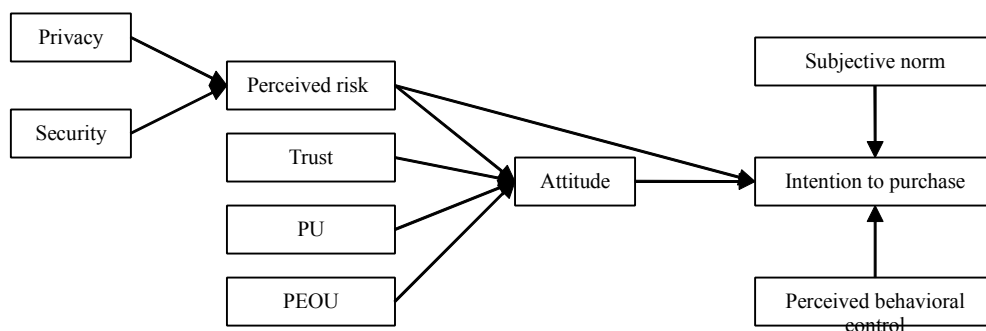


Figure 1 Our Theoretical framework

3.1 Perceived Risk and Attitude

Perceived risk was first conceptualized by Bauer (1967) in marketing literature as purchase intention in the theoretical framework of risk taking. According to the risk taking framework, consumers decide to buy a product under some degree of uncertainty about a given brand. Assuming perceived risk, consumers take steps to reduce it, mostly by relying upon a person or idea (Sheth and Venkatesan 1968). For instance, a consumer may rely on the brand image of a product or on the opinion of an expert. Perceived risk is used as a surrogate of risk since it is difficult to capture risk as an objective reality. Perceived risk is defined as the subjective probability of suffering a loss in pursuit of a desired outcome. Sitkin and Pablo (1992) suggested that perceived risk may mediate the effect of trust on intention and behavior.

Perceived risk associated with online shopping may reduce the consumer's perception of control and thus, may negatively influence the willingness to buy online (Jarvenpaa et al. 2000). Perceived risk was found to be

significant with consumer's willingness to buy books from websites. Therefore, the next hypothesis is as follows:

H1: Perceived risk negatively influences consumer attitudes towards online shopping in b2c e-commerce.

H2: Favorable attitudes towards online shopping will increase the consumer's purchase intention.

H3: A high level of perceived risk will decrease purchase intention in b2c e-commerce.

3.2 Privacy and Security

If a consumer is too concerned about privacy and security it will influence how she will trust an online vendor, or perceive risk in purchasing from the vendor. There has been a limited research which has studied the relationship amongst security, perceived risk and purchase intention. In most cases, security has been included as a part of privacy concerns. It is suggested in the literature that privacy protection and security protection may be an important antecedent in perceived risk. Therefore, the next hypothesis is as follows:

H4: A higher level of privacy concerns will increase perceived risk.

H5: A higher level of security concerns will increase perceived risk.

3.3 Trust

Trust is critically important in many business relationships and it determines the nature of many businesses and the social order (Moorman et al. 1992; Fukuyama 1995). Bailey and Bakos (1997) found trust to be more important in online markets than in physical ones. This is because neither product characteristics nor seller identity can be fully assessed during the transaction and making cheating becomes easier (Ba and Pavlou 2002) and because the virtual nature of online environment eliminates many prominent social cues (for example, words-of-mouth, body language, etc.) that might otherwise be used to establish trust (Gefen 2000). Jarvenpaa et al. argued that lack of trust prevented consumers from engaging in online transactions. Trust is the foundation of e-commerce.

According to Pavlou and Fygenson, trust creates favorable perceptions about the outcomes of the vendor's actions and in turn, creates positive attitudes. In the ecommerce setting, trust influences purchasing intentions by creating positive attitudes. The following hypothesis is thus proposed:

H6: Trust positively influences attitude towards online shopping in b2c e-commerce.

3.4 TAM Beliefs in TPB-Based Model

Online consumers are both consumers and computer users (Koufaris 2002). Technology adoption has a direct impact on online purchase intention and thus it has been a major research stream in both IS and marketing literature. As such, online purchase intentions should be explained in part by TAM.

TAM posits that the intention to use an information system is determined by PU and PEOU. These two constructs have been widely used to predict online purchase intention. PU refers to the degree to which one believes that using a system will enhance her performance and PEOU refers to the degree to which one believes that using the system will be effortless. PU has been shown to influence behavioral intention through attitude. Like PU, PEOU influence behavioral intentions through attitude, but PU are influenced by PEOU or PU acts as a moderator between PEOU and behavior (Henderson and Divett 2002).

According to TAM, both PU and PEOU influence behavioral intention through attitude. Thus, the following hypotheses are proposed:

H7: PU positively influences attitude toward online shopping in b2c e-commerce.

H8: PEOU positively influences attitude toward online shopping in b2c e-commerce.

3.5 Subjective Norm

Subjective norm (SN) is described as a person's normative belief that his/her behavior is accepted, encouraged, and promoted by his/her social circle of influence. Prior studies suggest that there is a positive relationship between subjective norm and behavioral intention. According to social psychology theories, an individual's behavior is not just driven by evaluative beliefs and attitudes, but also by subjective norm, perceived behavioral control, and habits (Burton-Jones and Hubona 2006).

In the e-commerce setting, this relationship can be stated as consumer's subject norm is positively related to intention to online purchasing. Karahanna and Straub (1999) provided an empirical support that social influence affect user's belief on a new technology. Bhattacharjee (2000) found that subjective norm was an important predictor of initial intention to use online brokerage services. Doyle (2007) indicated that the research showed that more than 75 percent of customers would consult a friend before they decided to purchase a certain product or service. However, subject norm could be different between online and offline consumers. The relationship between subjective norm and behavioral intentions is further examined in this study. The hypothesis to be tested follows:

H9: Subjective norms of consumer have a positive relationship with purchase intention in b2c e-commerce.

3.6 Perceived Behavioral Control

TPB extends TRA by including perceived behavioral control (PBC). PBC refers to an individual's perception of how easy or difficult it is for him to perform a behavior and it reflects beliefs regarding access to resources and opportunities required to facilitate a behavior. PBC not just positively influences intention along with attitude and subjective norm (SN), but also positively determines the final behavior with intention together. Such dual role of PBC has been empirically supported by Mathieson (1991) and Taylor and Todd (1995). Neglecting PBC and relying on simpler models may lead to the study of online purchase intention incomplete and potentially misleading. For this study, perceived behavioral control is defined as a consumer's perceived ease or difficulty in buying from the online shopping.

H10: Perceived behavioral control positively influence purchase intention in b2c e-commerce.

4. Research Methods

4.1 Instrument Development

This study used a survey instrument to collect data on the variables in the conceptual model illustrated in Figure 1. Based previous research into the TAM and TPB, we selected survey items for the measurement of each construct and developed a questionnaire that included those items. Four questionnaire items were used to measure the level of privacy, security, perceived risk, trust, PU, and PEOU. Among the measurement of Attitude, subjective, intention to purchase, perceived behavioral control, three items were used. A 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) was used for the responses.

The initial version of the survey instrument was pretested by four university professors, each holding significant expertise in the field of electronic commerce. After obtaining feedback from these experts, the

wording and arrangement of the measurement items were modified. Then, the revised version was further pilot-tested on 25 participants who had extensive experience in online shopping. The pilot group represented various workforce demographics, including scholars, online buyers, and CEOs of small and medium sized businesses.

4.2 Data Collection and Analysis

Our research is targeted at consumers who have shopping experiences through the online shopping in china. The data is applied to test the research hypotheses obtained from the consumers of the TAOBAO in china. To maintain external validity, we tried to sample data from various groups like schools, companies, research institutes. E-mail and QQ message were also employed to collect sample responses. It has taken over 8 weeks to collect the sample data. The online survey has received 234 responses.

Cronbach's alpha was used to evaluate the reliability of the variables. Factor analysis and internal consistency were also checked to assess the validity of the constructs. Amos18 software is used to test the research hypotheses. This software is particularly appropriate for testing the model fit, in addition to identifying the underlying cause-effect relationships among variables (Byrne 2009).

5 Empirical Analysis

5.1 Reliability and Validity

Because various items are being employed to measure abstract concepts, these items must be assessed by Spss18 for reliability and validity. Whereas Cronbach's alpha presumed that each item carries the same weight, composite reliability relied more on the actual loading score of a construct; therefore, it is considered a better measurement for internal consistency. In order to get adequate internal consistency, the value of composite reliability must be greater than 0.7. The AVE reported the proportion of the variance of the measurement items, which is accounted for by a construct. The AVE values of all constructs were greater than 0.50, indicating that over 50% of the variance is explained by the measurement items (see Table 1).

Table 1 Reliability indices for Constructs

Construct	AVE	Composite reliability	Cronbach's alpha
PI	0.72	0.89	0.92
SE	0.72	0.92	0.89
PR	0.70	0.87	0.88
TR	0.58	0.94	0.84
PU	0.64	0.84	0.92
PEOU	0.61	0.82	0.81
AT	0.62	0.87	0.89
IP	0.66	0.87	0.92
SN	0.55	0.79	0.91
PBC	0.67	0.86	0.86

Note: PI = Privacy; SE = Security; PR = Perceived Risk; TR = Trust; PU=Perceived usefulness; PEOU=Perceived ease of use; AT = Attitude; IP = Intention to purchase; SN = Subjective Norm; PBC=Perceived Behavioral Control.

5.2. Structural Model and Hypothesis Testing

In SEM, the relationships between the constructs can be identified by providing path coefficients for each hypothesis. Each estimated path can be tested for its representative significance, including standard error, and t-values. If an estimated t-value exceeds the critical value of 1.96, using an alpha of .05, then the null hypothesis

that the parameter was equal to 0 is rejected and the hypothesized relationship was supported. We employed a maximum likelihood analysis using AMOS 18 with the simultaneous estimation of the measurement and structural model. Analysis of the structural model generated a Chi-Square value of 2302 (DF = 713). AGFI is 0.89, CFI is 0.98, NFI is 0.94, NNFI is 0.97, and SRMSR is 0.034. All fitness indicators are in the accepted range.

All but two of the hypotheses (H3:PR→IP, H7:PU→AT) were supported. All correlations were significant with t-statistic greater than 1.96 and p-value < 0.05. The parameter unstandardized coefficients and standard errors for the hypothesized model are provided in Table 2. The results are fairly consistent with the hypothesized Web site usability and e-commerce acceptance model.

Hypothesis 3 indicating the relationship between perceived risk and purchase intention was not supported (Co = .04, t = -1.31, p > .05). There was no support for the argument that the more perceived risk lead to lower intention to purchase in e-commerce. It appears that there is a full mediation of attitude in the relationship between perceived risk and purchase intention. In other words, there is no direct effect of perceived risk on purchase intention.

Hypothesis 7 indicating the relationship between perceived usefulness and attitude was not supported (Co = .03, t = 0.98, p > .05). A plausible explanation of this unexpected finding is that many young generations have started their online experiences at early ages and they usually see the Internet or online information systems as a commodity. With such belief, they may not believe e-commerce or online shopping systems would improve their performance or increase productivity just like a brick-mortar store doesn't improve consumer's performance. In other words, once a technology becomes a commodity, people no longer consider it as an innovation that would improve their performances or increase productivity, but instead they see it as a necessary tool that they use for their daily life. Such perception is similar to Pavlou and Fygenson's (2006) argument that productivity does not make much sense in ecommerce and PU should emphasize on enhancing the consumer's effectiveness in purchasing products. Therefore, the finding suggests that the meanings and interpretations of PU need to be re-conceptualized in the study of online purchase intention in order to catch the specific context in the e-commerce setting.

Table 2 Path Coefficients and Results of Hypothesis Testing

Number	Path	Coefficient	T value	Results
H1	PR→AT	-0.45*	-3.43	Supported
H2	AT→IP	0.81*	8.61	Supported
H3	PR→IP	-0.04*	-1.31	Not supported
H4	PI→PR	0.31*	4.07	Supported
H5	SE→PR	0.39*	3.92	Supported
H6	TR→AT	0.09*	2.67	Supported
H7	PU→AT	0.03*	0.98	Not supported
H8	PEOU→AT	0.29*	4.02	Supported
H9	SN→IP	0.22*	4.84	Supported
H10	PBC→IP	0.59*	9.78	Supported

*Significant at p<0.05

6. SUMMARY AND CONCLUSION

6.1 Summary of Findings

Online purchase intention has become one of the most important research areas in management information systems and marketing. E-commerce has gained a comparable market share to traditional brick-mortar business. Both of them have become equally important marketing and sales channels and they compensate each other in delivering products and services. This study examined several major antecedents that have been believed to determine online consumer purchase intention. The major antecedents introduced in the research model were identified from prior research findings. Six major antecedents were examined as to their effects on online purchase intention in the extended-TBP model. They are PU and PEOU; trust and perceived risk (privacy and security). Among them, PEOU, trust, and perceived risk were found to significantly influence online consumer purchase intention through the direct impacts on attitude toward purchasing.

This study has achieved two research objectives. First, it attempted to offer a more comprehensive conceptual model than prior studies in order to examine more antecedents and their compound effects in a unified model. The research model drew from the well-established theory of planned behavior, aiming to focus more on purchase intention perspectives. The empirical testing showed that this study effectively provided a broader view of online purchase intention by examining multiple antecedents in the TPB-based research model. In general, this model provided a valuable research avenue to better understand online purchase intention from a more comprehensive perspective. Second, this study aimed to offer the empirical evidences on the linkages between ten major antecedents and online purchase intention.

6.2 Contribution of the Study

This research is built on many previous research works, mostly on Pavlou and Fygenson's (2006) research. The primary contribution is that this study empirically examines several major antecedents to online purchase intention in one unified model. The research model adopts the positivist paradigm and takes into account the effects of behavioral TAM beliefs, trust and perceived risk, purchase intention, attitude, subject norm, and perceived behavioral control in the TPB-based research model.

6.3 Limitations and Recommendations for Future Research

This study has some methodological and theoretical limitations that create some opportunities for future research. This study used a retrospective or self-report method to obtain information about the participants' past online shopping experiences.

Firstly, this study collected general information about participants' past online purchasing experiences without specifying a particular e-commerce website or a particular product/service they had purchased. This instrument design has a certain tradeoff.

Secondly, this study adopted the measurement instruments from prior research, mostly from the area of management information systems. Some instruments may not be well suited for the study of online purchase intention or for the TPB-based model.

In conclusion, this study provides a valuable research model and empirical results in the area. Meanwhile, it exposes some limitations of the research method and the measurement instruments. Overcoming these

limitations in future research will open new research avenues for the study of online purchase intention.

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