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IDENTIFYING USERS' BEHAVIOR PURCHASING VIRTUAL ITEMS

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Abstract

Virtual asset has become more important in the virtual worlds. A growing number of users involve in the virtual worlds has created a new business phenomena. An online transaction on virtual goods involves real money. This research mainly focus on finding out what are the factors influence customers' behavior and how to predict it toward purchasing in virtual worlds. There are thirty eight participants from different countries involve in this study. An online questionnaire is design to get necessary information from the users. The correlation and regression analysis applied in order to predict customer behavior toward purchasing in virtual worlds.

Keywords: Virtual Worlds, Users' Behavior, Real Money Transaction, Human-Computer Interaction, Virtual Goods.

Introduction

Internet has created a lot of opportunities in the area of business. A growing number of users had contributed to a growing number of people use Internet for shopping. Aside from that, a new area of 3D Online Virtual World has been arising. Virtual World started as Virtual Game. The communities in the Virtual Games are considered one of the most promising online game models – integrating traditional computer games into the context of collaborative virtual environments [1]. There are several types of 3D Online virtual worlds; such as: THERE[®], Moove[®], Active Worlds[®], Dreamworld[®], Cybertown[®], World of Warcraft[®], Second Life[®], Sims Online[®], etc.

Virtual Worlds are not just games or character development for its “avatar”. It has been moved beyond that. Hemp in his article for Harvard Business Review said that the real-world marketing potential of online worlds is suggested by the active virtual commerce that already takes place within them [2]. This made possible as the virtual worlds have virtual currencies that allows participant to buy and sell online.

The avatar is the most conspicuous online manifestation of people's desire to try out alternative identities or project some private aspect of them [2]. (The word, which originally described the worldly incarnation of the Hindu god Vishnu, was

popularized in its ‘cybersense’ by Neal Stephenson in his 1992 cult novel *Snow Crash*.) Broadly defined, “avatar” encompasses not only complex beings created for use in a shared virtual reality but any visual representation of a user in an online community [2].

Second Life[®] (SL) is one of the most well-known 3D Virtual Online Games which has developed the business successfully. There are 13 million users since it launched in 2003 [3]. As the first Quarter (Q1) 2009, Linden Research Lab (the owner of SL) reports that user-to-user transaction increased 65% from Q1 2008. In Q1, Residents spent more than USD\$120 million on virtual goods and services in Second Life, representing 20% growth over Q4 2008 [4]. SL includes an endogenously maintained currency exchange (known as LindeX) which allow users to trade between USD (US\$) to Linden Dollar (L\$).

Entropia Universe[®], a popular Virtual World Game in Europe has entered Guinness World Book of Records for the most expensive virtual item ever sold (US \$26,500) in 2004 using Project Entropia Dollar (PED) [5]. Cyworld[®], a popular Virtual World Game in South Korea uses virtual currency called “dotori” which is literary translated to mean acorns. As in 2005 Cyworld reported to have 25% of the total population in South Korea with US \$300,000 daily revenue [6].

Considering the opportunity and real money transaction involve, a new market has emerged for so-called ‘virtual assets’. Virtual assets are intangible valuables that exists solely in the computer systems known as virtual worlds – elements that may have a significant role in improving the overall competence or appearance of the characters owned by a player such as items (e.g., weapons or clothing), or virtual currencies. Elements constituting to the overall numerical competence of the character are the artefacts and wealth the player acquires for the character [7].

The research questions in this paper are what the factors influence customer's behaviors are and how to predict it toward the shopping for the virtual assets. The questionnaire is designed for collecting data and the statistical analysis applied. Finally, discussion and future recommendation are made at the end.

Business in Virtual Worlds

Residents in the Virtual Worlds are required to pay if they want to enjoy more features. Most of the virtual world game communities are based on a Massive Multiplayer Online Role-Playing Game (MMORPG). In a MMORPG, millions of participants are able to interact with each other as well as with computer-controlled creatures or non-player characters (NPCs) by assuming different personality (e.g., warrior, mage, animal, priest or thief). As the game continues, players can buy and sell their virtual assets to others using the virtual currency just as in the real world [1].

Trading virtual goods in the Virtual Worlds has created a new opportunity. Many SL residents have build seven-digit income (in real US dollar) from creating and selling virtual items (such as clothes for avatars) or virtual land development. Consumers like to purchase virtual items (as gifts or for themselves) to customize their experience, and Linden Lab recently acquired an eBay-like web marketplace to help consumers find their key items and to expand the reach merchants [8]. Digital agencies and brands entered the virtual world in force in 2007, but the need for brands to control their context and reach a broad audience proved a challenge in the world of user-generated content. For real-world companies, the branding and advertising opportunities of virtual worlds are multiple. Not only can marketers reach out to young and tech-savvy audience – who are often impervious to traditional marketing techniques – but they can also engage with them more deeply to inspire brand loyalty. This is indicative of a wider online brand shift, with virtual world presence, multimedia outreach and apps on social network [8].

In November 2006, the first virtual millionaire was announced in Second Life® [6]. Anshe Chung, who is the virtual avatar of Ailin Graef, spent more than two years in SL developing virtual islands, crafting landscapes and providing virtual housing for paid participants with her real-world husband, Guntram Graef. With over L\$ 270,000,000 (US \$1,000,000) in assets, Anshe Chung was proclaimed by CNN and other news center as the first “Virtual Rockefeller” [6]. Her virtual company has more than ten real-world employees to help design virtual real estate, and is registered in the real-world in Hubei, China [6].

Considering a lot of real-money involved in the virtual world transaction, some countries have implemented tax for its real profits. In 2007, the United Kingdom's HM Revenue and Customs department said that it was investigating people who were earning profits in social virtual worlds like SL and not paying taxes on the profits. Sweden also declared that it would tax profitable activities in

online worlds. Until November 2008, USA has yet to issue any guideline on virtual income taxes. In fact, China has taken initial steps by issued a specific declaration regarding the taxation of profits derived from such sales – sales which China says fall under its provision for the taxation of “transfer of property” [9]. It is fall under the circular called “Circular on Further Strengthening the Administration on Internet Bar and Online Games”. The circular expressly prohibits the exchange of virtual currency for real world currency or the purchase of real commodities using virtual currency. Thus, even though such transactions may be illegal in China, if you nevertheless engage in and generate a profit from such transactions, you will be obligated to pay tax on those profits [9].

Recently in late February or late March, Second Life® has conducted a survey of business owner to learn how residents feel about the SL economy. The overall respondents are 2,645 business owners including 767 who run businesses but own no Land with 48% of respondents outside the USA. The findings are; 61% of business owners are optimistic that their revenue will grow and 68% are maintaining or increasing their investment to the last six months [10]. Overall, business in the virtual worlds has a good future prospect and potential to be developed as the real world business.

Theory of Reasoned Action

This theory developed by Fishbein and Ajzen, suggested that a person's behavior intention is jointly determined by two independent factors, attitude towards behavior and subjective norms [11]. The attitude towards behavior is the factor refers to individual's positive or negative feelings about performing specific behavior (e.g. using a new technology), and the subjective norms is determined as an individual's normative beliefs which an individual perceives that important others believe he/she should perform a given behavior. This theory has been used as foundation for the development of Theory of Planned Behavior (TPB) and Theory of Acceptance Model (TAM).

Theory of Planned Behavior

This theory is an extension of TRA proposed by Ajzen by introducing a new factor, perceived behavioral control [12]. The additional factor added to address the inability of TRA to account for conditions where individuals do not have total volitional control over their behavior. Ajzen defined Perceived Behavioral Control as one person's perceptions of how easy or difficult it is to perform specific behavior based on his/her ability (i.e., internal factor) or resources (i.e., external factors). He also argued that perceived behavioral control has a direct link with the actual behavior if perceived

behavioral control, to some extent, is consistent with the actual behavior control [12].

Limayem *et.al* augmented this theory with two new factors; personal innovativeness and perceived consequences [13]. This theory is chosen not only because the TPB's constructs are easier to operationalize, but also because this theory has received substantial empirical support in information systems and other domains as well (e.g., [14]–[17]). They argue that shopping on the Internet is an innovative behavior that is more likely to be adopted by innovators than non-innovators [13]. It is thus important to include this construct in order to account for individual differences. Its inclusion has important implications for both theory and practice. From a theoretical perspective, the inclusion of personal innovativeness furthers our understanding of the role of personality traits in innovation adoption [18]. From the perspective of practice, the identification of individuals who are more likely to adopt online shopping can be very valuable for marketing purposes, e.g., market segmentation and targeted marketing [13].

They hypothesized that personal innovativeness has both direct and indirect effects, mediated by attitude, on intentions of innovation adoption. The indirect effect implies that innovative individuals are more likely to be favorable toward online shopping, which in turn affects positively their intentions to shop on the Internet. The direct link between innovativeness and intentions, on the other hand, is meant to capture possible effects that are not completely mediated by attitude [13].

The other new links that Limayem *et.al.* added to the TPB are the ones representing the potential effects of “perceived consequences.” This construct is borrowed from Triandis’ model [19]. According to Triandis, each act or behavior is perceived as having a potential outcome that can be either positive or negative. An individual’s choice of behavior is based on the probability that an action will provoke a specific consequence. The TRA and the TPB claim that beliefs such as perceived consequences are completely mediated by attitude. For this reason, Taylor and Todd modeled a similar construct, perceived usefulness, as an antecedent of attitude [20]. Triandis, on the other hand, modeled perceived consequences as a direct antecedent of intentions.

Research Model

This research uses Theory Planned Behavior extended model by Lemayem *et.al.* [13]. The hypotheses for this model are:

H1: There is a positive correlation between perceived consequence and intention to shop in virtual world.

H2: There is a positive correlation between perceived consequence and attitudes.

H3: There is a positive correlation between attitudes and intention to shop in virtual world.

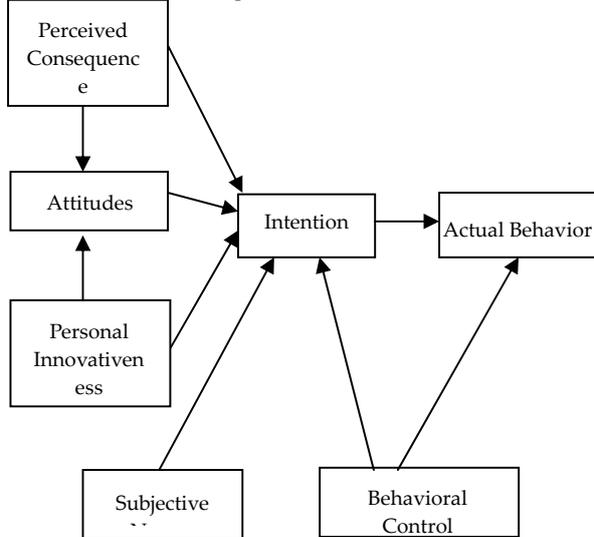


Figure 1. Extended Theory Planned Behavior

H4: There is a positive correlation between personal innovativeness and intention to shop in virtual world.

H5: There is a positive correlation between personal innovativeness and attitudes.

H6: There is a positive correlation between subjective norms and intention to shop in virtual world.

H7: There is a positive correlation between behavioral control and intention to shop in virtual world.

The online 5 points Likert Scales questionnaire is design to the virtual world users. The questions cover demographic data and measurement variable to test the hypotheses. It includes these questions:

- I purchase on the virtual worlds because its risk of privacy violation
- I feel that I have ability to navigate in the virtual world
- I like the product description
- I must see other people using innovations before I consider them
- The Media (e.g., advertisement) influences me to purchase

Cronbach’s alpha coefficient test applied to the final data in order to test the reliability of the data. The data will be analyzed using SPSS. Pearson Correlation Co-efficient (r) used to test the correlation between the variable and Multiple Linear Regressions are run to examine the standardized beta co-efficient (β). The final conclusion is made based on the Pearson Correlation Co-efficient, the standardized beta co-efficient and linear relationship between the variables.

Data Collection and Result

The online questionnaire is published on <http://www.surveygizmo.com/s/129049/customer-shopping-behaviors-in-virtual-worlds>. There are thirty eight respondents who completely filled the questionnaire. They are from Asia, Europe, USA, Australia, North America, Latin America and New Zealand.

Table 1. Demographic

Category	Percentage
Gender	
Male	34.29
Female	65.71
Age	
Below 20 years	5.71
20 – 30 years	17.14
30 – 40 years	22.86
40 – 50 years	28.57
50 years above	25.71
Education background	
High School	28.57
Undergraduate	42.86
Master	22.86
Doctoral	5.71
Years involving in Virtual Word	
Less than 1 year	28.57
1 – 3 years	28.57
4 – 6 years	25.71
More than 6 years	17.14
Hours spend in Virtual Worlds per week	
Less than 10 hours	22.86
10 – 20 hours	28.57
20 – 30 hours	31.43
30 – 40 hours	2.86
More than 40 hours	14.29

Most of the users play Second Life[®] followed by Ultima[®], Cyberlandia[®], OpenSims[®], World of Warcraft[®] and YoVille[®]. Majority of the users (80%) say that they have done purchasing inside the virtual worlds. From the 80% who has been purchased says that they purchase virtual goods (93.10%). As it has mentioned before that the data collected will be test for the reliability using the Cronbach's Alpha before doing the correlation and regression test. Nunally suggests that a coefficient of 0.7 or higher is considered "acceptable" [21]. The Cronbach's Alpha for the data is 0.784. This means that the data collection reliable and accepted. Then, the Pearson's Correlation Co-efficient of Bivariate Correlation is tested using the SPSS. The result is shown below.

Table 2. The Pearson's Co-efficient of Bivariate Coefficient

	PC	BC	PI	SN	A	I
PC	1					
BC	.476(*)	1				
PI	.191	.195	1			
SN	.356	.298	-.092	1		
A	.184	.473(*)	-.023	.495(**)	1	
I	.284	.621(**)	-.240	.412(*)	.566 (**)	1

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

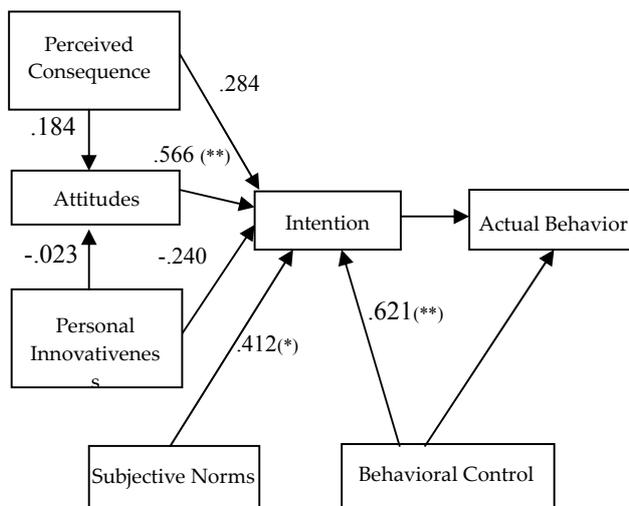


Figure 2. Extended TPB with Pearson's Coefficient

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

The next step is to determine the relative importance or path coefficients of the variables using the Standardized Beta Coefficient (β); which used for the accuracy of prediction [22]. The result of the Standardized Beta Coefficient is shown on the table below:

Table 3. Regression Analysis Result (Model Summary & ANOVA)

Model	Sum. of Squares	Df	Mean Square	Adjusted R Square	F	Significance
Regression ^a	12.381	5	2.476			
Residual	8.381	22	.381	.505	6.5	.001
Total	20.762	27				
Regression ^b	.394	2	.197			
Residual	10.126	25	.405	-.040	.487	.620
Total	10.520	27				

a. Predictor: (Constant), PC, BC, PI, SN, A, Dependent Variable: I

b. Predictor: (Constant), PC, PI, Dependent Variable: A

c. Significance = 0.01

Table 4. Significant Predictors of Structural Model

Model	Unstandardized Coefficient		Standardized Coefficient	t	Sig. ^c
	B	Std. Error	Beta		
(Constant)	.691	1.183		.584	.565
1 ^a	.035	.246	.023	.143	.888
PC	.817	.271	.524	3.018	.006
BC	-.580	.248	-.332	-2.339	.029
PI	.089	.170	.088	.526	.604
SN	.369	.242	.263	1.524	.142
A					
(Constant)	3.415	.970		3.520	.002
2 ^b	.211	.215	.196	.979	.337
PC	-.076	.249	-.061	-.304	.764
PI					

a. Dependent Variable: Intentions

b. Dependent Variable: Attitudes
c. Significance = 0.05

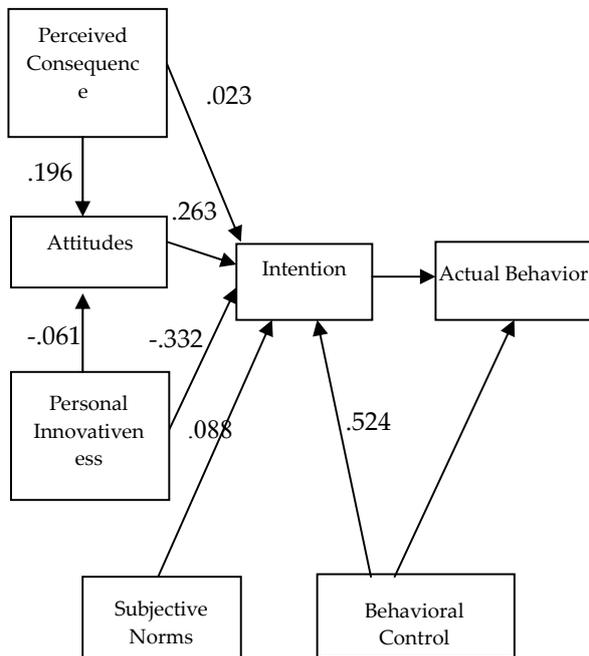


Figure 3. Extended TPB with Standardized β Coefficient

From the first regression analysis which has Perceived Consequence (PC), Attitudes (A), Personal Innovativeness (PI), Subjective Norms (SN), and Behavior Control (BC) as predictors and Intention (I) as dependent variable shows that the adjusted $R^2 = .505$. This means that 50.5% of the variation in Intentions is explained by the five predictors. Meanwhile the second regression analysis which has Perceived Consequence (PC) and Personal Innovativeness (PI) as predictors and Attitudes (A) as dependent variable shows that the adjusted $R^2 = -.040$. It means that not even 4% of the variation in Attitudes is explained by the two predictors. This statement is supported by the Pearson's Correlation Coefficient (r) and Standardized Beta Coefficient of Personal Innovativeness to Attitudes is negative. So, it can be concluded that H5 is rejected.

The hypotheses will be tested through the statistical analysis. The Pearson's Correlation Coefficient (r) between Perceived Consequence (PC) and Intentions (I) is .284, and the Standardized Beta Coefficient is .023. It shows that there is a little positive correlation in between, therefore H1 is accepted. Then for the Pearson's Correlation Coefficient (r) between Perceived Consequence (PC) and Attitudes (A) is .184, and the Standardized Beta Coefficient is .196. It shows that there is a little positive correlation in between, therefore H2 is accepted. For the Attitudes (A) and Intentions (I), the Pearson's Correlation Coefficient (r) is .566 and the Standardized Beta Coefficient is .263. It shows that

there is moderate positive correlation in between, therefore H3 is accepted. In the correlation between Personal Innovativeness (PI) and Intentions (I), the Pearson's Correlation Coefficient is $-.240$ and the Standardized Beta Coefficient is $-.332$. It shows that there is a negative correlation in between, therefore H4 is rejected. The Pearson's Correlation Coefficient between Subjective Norms (SN) and Intentions (I) is .412 and the Standardized Beta Coefficient is .088. It shows that there is a low positive correlation in between, therefore H6 is accepted. In the correlation between Behavioral Control (BC) and Intentions (I), the Pearson Correlation Coefficient is .621, the Standardized Beta Coefficient is .524. It shows that there is a strong positive correlation in between, therefore H7 is accepted.

Overall, from the analysis result and the hypotheses testing shows that H1, H2, H3, H6 and H7 are accepted while H4 and H5 are rejected.

Discussions

In the final result of this research, Personal Innovativeness does not have any correlation both to Attitudes and Intentions. In the questionnaire there are several questions being asked such as: I am generally cautious about accepting new ideas; I must see other people using innovations before I consider them; and I am challenged by ambiguities and unsolved problems. Consider that most of the users (57.14%) are newly involve (less than 3 years) in the virtual worlds; means that most of them still curious about what happening if they purchase virtual goods. This situation leads users to wait for their friends, family and media (subjective norms) in stimulating them for purchasing virtual goods.

The strongest correlation with the Intentions is Behavioral Control. This factor includes trust to the seller, familiarity to the virtual games and navigation. It means that users are very careful to do purchasing in virtual worlds. The situation reflects to the previous report saying that players consider virtual asset purchases as being cheating [23] [24].

Beyond that, users consider more likely to buy virtual goods for their avatars. In the virtual worlds, the important aspect is character development: the skill and ability of one's avatar improve with play [25]. This will involve the real money transaction for the "achievement hierarchy" in virtual worlds [16] [23]. Bartle discussed that at least three reasons why virtual world's players feel compelled to make virtual asset purchase [23]. First, experiencing all the content programmed into a world requires players to develop their characters to the highest level. That takes lots of time, which not everyone has. Buying a high-level avatar is a shortcut that gives immediate access to all the content [16:7-8]. Secondly, some parts of the content may be so inappealing that even players with enough time would rather skip them

[16:15]. Thirdly, the virtual worlds are usually design in such a way that players who wish to play together have to have avatars of approximately the same level of prowess [23:24].

Conclusions

There are opportunities of real money transaction inside the virtual worlds. Many of the potential users spend more than 20 hours inside the virtual worlds. In the other hand, the virtual world's company owner has set a target for developing a good business environment. The Personal Innovativeness which is fund has no correlation to the Attitudes and Intentions. This can be decrease gradually as the users get other stimulant and get familiar with the virtual worlds. It is necessary to study in details about the future prediction of customer behavior.

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