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Post-Adoption Beliefs Influencing Continued Participation in Virtual Communities

By Jong-Ae Kim
Kyonggi University, Korea

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I. Introduction

Virtual communities have proliferated rapidly and gained popularity in recent years. With the proliferation of the Internet and mobile services, virtual communities have become important channels for social interaction and communication. The highly interactive nature of the Internet and mobile services has facilitated the rapid growth of virtual communities. With the growth of virtual communities, a broad range of communication and activities that had taken place offline have migrated into virtual communities. These migrations have improved the efficiency in people's communication and broadened interpersonal relationships. In virtual communities, people communicate with each other, exchange ideas, share knowledge, and build social relationships. They enable people to interact with others without the barriers of time and space. According to a survey conducted by the Center for the Digital Future (2008), online community members reported feeling as strongly about communities online as those in the real world. Lin (2009) emphasizes virtual communities as the most effective means of establishing new social relationships through Internet-based technology.

Rheingold (2000, 5) defines virtual communities as "social aggregations that emerge from the net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace". Hagel (1997) defines virtual community as a group of people interacting in cyberspace predominantly for their own common interests, relationship building, transactions, and fantasies. The concept of virtual community is also referred to as computer-mediated community, online community, electronic community, or e-community (Wang and Fesenmaier 2014).

Researchers identified the fundamental needs of virtual community members in their online activities as functional, social and psychological needs (Preece 2000; Wang et al. 2002). Virtual communities may satisfy community members' functional needs to fulfill specific activities by enabling transactions such as buying products and gathering information without the restrictions of time and space. Social needs are met when members communicate with each other, form meaningful relationships, and build trust. Psychological needs may include identification, involvement, unity/-belonging, and relatedness (Wang et al. 2002). Virtual communities can satisfy certain basic psychological needs of community members and make them a part of members' lives. Wang and Fesenmaier (2014) consider the hedonic needs to join virtual communities in addition to functional, social and psychological needs. Hedonic needs explain that people join virtual communities for their enjoyment and entertainment purposes. From the hedonic perspective, people as pleasure seekers engage in virtual communities to experience excitement and fun.

Based on the results of in-depth interviews with members of travel and gourmet virtual communities, Tsai and Pai (2013) identify three dimensions of community characteristics influencing members' proactive participation: social, hedonic, and utilitarian. As the social dimension of community characteristics, they identify member receptivity and member involvement. They also identify enjoyment as the hedonic dimension and informativeness as the utilitarian dimension of community characteristics. Li and Lee (2013) assert that there is a social cycle process for membership development in virtual communities. The process encompasses joining virtual communities, staying silent, becoming active, quitting, or becoming inactive again. For virtual communities to be sustainable, they need to be fostered properly. Continuous participation of

Author: Kyonggi University, Gwanggyosan-ro Youngtong-gu Suwon-city, Kyonggi-do, South Korea. e-mail: jongaekim@kgu.ac.kr

members is crucial to the sustainability of virtual communities, thus the understanding of the drivers that lead them to participate and share their interests are critical for the success of virtual communities.

Certain virtual communities have been successful, demonstrating their great potential. However, decreases in the level of participation are often shown in many virtual communities after the initial adoption of users. It is reported that half of new users abandoned their accounts in the social network websites soon after they created their accounts (Li 2011). Although the initial adoption is an important indicator of the success of virtual communities, the ultimate viability of them is dependent on continued participation of members. Despite the importance of continued participation of members for the sustainability of virtual communities, the understanding of the determinants of members' continuous participation has not been well established. This study explores the factors affecting individuals' continued participation in virtual communities.

This study aims to explore what motivates individuals to continue to participate in virtual communities. It investigates the antecedents of behavioral intention to continued participation. Continued participation in virtual communities may be determined by a number of variables. In this study, a comprehensive model that incorporates the antecedents of individuals' behavioral intentions to continued participation is proposed and empirically tested. The implications of the results of this study are expected to contribute to identifying key predictors of individuals' continuance intentions and provide insights into effective strategies to vitalize virtual communities in the post-adoption stage.

II. Theoretical Background and Research Model

Based on the extensive literature review, this study proposes and validates the antecedents of behavioral intention to continued participation in virtual communities. A research model in this study attempts to explain one's intention to continue to participate in virtual communities. The research model is depicted in Figure 1.

Attitude has been shown to be a significant predictor of behavioral intention in the extensive research. According to Ajzen and Fishbein (1980), attitude is formed based on a collection of underlying behavioral beliefs about the expected outcomes of a behavior and the favorable or unfavorable evaluation of these outcomes. The relationship between attitude and behavioral intention has received substantial empirical support (Ajzen and Fishbein 1980; Davis 1986). Bhattacherjee and Premkumar (2004) found that attitude influenced intention of continuous use of computer-based training systems. In a study by Mäntymäki and Salo (2011), attitude toward using the social virtual worlds was found to have a positive effect on continuous use intention. In a study to investigate motivational factors to knowledge sharing, Chennamaneni *et al*. (2012) found that attitude exerted a significant influence on behavioral intention to share knowledge. In addition, in a study to examine virtual community members' knowledge-sharing intentions toward Chinese Wikipedia, Ho *et al*. (2011) reported that attitude toward knowledge sharing was positively associated with intention to share knowledge in a virtual community. Based on prior studies, it is hypothesized that attitude toward participating in a virtual community is positively associated with one's intention to continued participation

Hypothesis 1: Attitude toward participating in a virtual community is positively associated with one's continuance intention.

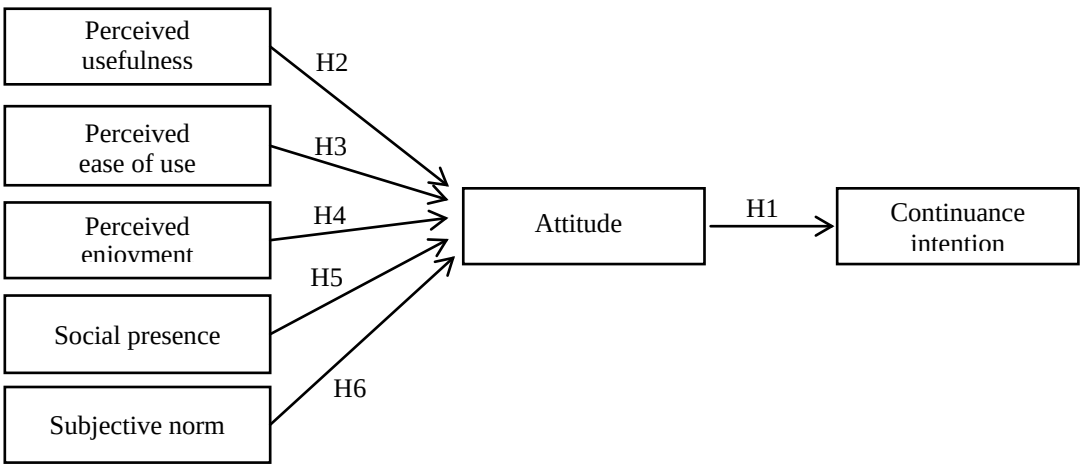

Fig. 1 : Research model

Perceived usefulness and perceived ease of use have been shown to affect one's attitude toward using information technology. In the technology acceptance model (TAM), perceived usefulness and perceived ease of use are validated as two internal belief determinants affecting users' attitude, which in turn affect users' behavioral intentions to adopt the technology (Davis, 1989). A number of studies applied TAM to explain users' continuance intentions in the post-adoption stage in that continued usage is an extension of adoption (Karahanna 1999; Lee and Tsai 2010; Venkatesh and Brown 2001; Venkatesh and Davis 2000). Perceived usefulness is defined as the degree to which a person perceives that the use of a particular system enhances his or her job performance (Davis 1989). Bhattacherjee (2001) also included perceived usefulness in the expectation-confirmation model and validated its consistent power in explaining continued usage behavior in the post-adoption stage. When a person perceives that a virtual community is useful to him, he is likely to form a positive attitude toward participation. Thus, this study hypothesizes that perceived usefulness is positively associated with one's attitude toward participation in a virtual community.

> Hypothesis 2: Perceived usefulness is positively associated with one's attitude toward participation in a virtual community.

Perceived ease of use refers to the degree to which a person perceives that the use of a particular system is free of effort (Davis 1989). A significant effect of perceived ease of use on attitude toward the system has been validated in prior research on information system adoption (Davis 1989; Wang *et al*. 2012). Easy-to-operate functions and user-friendly interfaces are likely to lead community members to form a positive attitude toward participation in a virtual community, thus accessing the community without abandoning it. Thus, it is hypothesized that perceived ease of use is positively associated with one's attitude toward participation in a virtual community.

> Hypothesis 3: Perceived ease of use is positively associated with one's attitude toward participation in a virtual community.

Motivation theory explains that both intrinsic and extrinsic motivations drive individual behaviors (Deci and Ryan 1987). Intrinsic motivation refers to the pleasure and satisfaction gained from performing a behavior, whereas extrinsic motivation emphasizes performing a behavior to achieve valued outcomes such as improved job performance (Davis *et al*. 1992). Prior studies have demonstrated that perceived enjoyment as an intrinsic motivator influences one's attitude toward using certain information technology services (Davis *et al*. 1992; Thong *et al*. 2006; Van der Heijden 2004). Perceived enjoyment refers to the extent to which an activity is perceived to be enjoyable in its own right, apart from any goals or rewards derived from performance consequences (Davis *et al*. 1992; Deci and Ryan 1987). Since the participation in virtual communities can be explained with intrinsic motivation such as pleasure and fun, the research model in this study incorporates perceived enjoyment as one of the salient beliefs influencing attitude toward participation. It can be expected that individuals who experience enjoyment from participating in a virtual community are more likely to form positive attitude toward participation. Thus, it is hypothesized that perceived enjoyment is positively associated with one's attitude toward participation in a virtual community.

> Hypothesis 4: Perceived enjoyment is positively associated with one's attitude toward participation in a virtual community.

Virtual communities serve people's needs for communication, information, and entertainment (Lin 2006). Social presence is critical for effective communication in social networks, and a lack of social presence results in communication weakness in virtual communities (Koh *et al*. 2007). Elaborating social presence theory, Short *et al*. (1976, 65) defines social presence as the "degree of salience of the other person in the mediated interaction and the consequent salience of the interpersonal relationships". Social presence is also explained as the degree to which a medium is perceived to convey a feeling of human contact, sociability, and sensitivity (Yoo and Alavi 2001). Gunawardena and Zittle (1997) explain social presence as the degree to which community participants perceive that the other person is physically present or real in their engagement in virtual communities.

Social presence is essential to developing social relationships and a sense of community in virtual communities (Kreijns *et al*. 2003; Paloff and Pratt 2005). It is considered the central design principle for social community technologies (Ijsselsteijn and Riva 2003). Social presence can be enhanced when people share their experiences and ideas with human images and testimonials in virtual communities (Crutzen *et al*. 2013). Previous studies reported that social presence influenced usage behavior of various social websites (Chui *et al*. 2008; Lee 2006; Nov *et al*. 2008). Crutzen *et al*. (2013) suggests that social presence results in a positive user experience, thus positively affecting their attitude toward using the social websites. Building on prior studies, it is hypothesized that social presence is positively associated with one's attitude toward participation in a virtual community.

> Hypothesis 5: Social presence is positively associated with one's attitude toward participation in a virtual community.

The need to consider social influence on user acceptance of information technology has been emphasized by researchers. Davis (1989) suggested

the need to explain the effect of social influence on user acceptance of information technology in future research although he did not explicitly include social norm in the TAM. In the TAM2 developed by Venkatesh and Davis (2000), subjective norm was included to explain a user's adoption behavior. Subjective norm is defined as a "person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein and Ajzen 1975, 302). It refers to an individual's perception of social pressure from an important referent group to perform or not to perform a specific behavior (Chennamaneni *et al*. 2012). It is based on normative beliefs of whether the behavior is accepted and encouraged by significant referents. An individual's attitude toward participation in a virtual community may be influenced not only by his/her own motivations, but also by significant referents (Davis *et al*. 1989; Zhou 2011).

Subjective norm may exert an influence on participation behavior through the process of compliance because people tend to achieve favorable reactions from significant others. Compliance occurs "when an individual accepts influence because he hopes to achieve a favorable reaction from another person or group" (Kelman 1958, 53). Considering the social nature of interpersonal interactions in virtual communities, it is expected that subjective norm affects one's attitude toward participation in a virtual community. If people who are important to a person recommend him to participate in a virtual community, it is likely to affect his attitude toward participation. Prior studies reported the positive influence of subjective norm on information technology adoption (Bock *et al*. 2005; Cabrera *et al*. 2006; Venkatesh *et al*. 2003). Srite and Karahanna (2006) contend that, through informational and normative influence, subjective norm may reduce uncertainty about whether or not system use is acceptable and valuable. Cheung *et al*. (2008) found that social relationship was the most common motivator for contributing to online forums. Kim *et al*. (2009) reported a positive impact of subjective norm on attitude toward use of airline B2C eCommerce websites. Building on the earlier studies, it is hypothesized that subjective norm is positively associated with one's attitude toward participation in a virtual community.

H6: Subjective norm is positively associated with one's attitude toward participation in a virtual community.

On the basis of the previous discussions, the research model in this study proposes a framework for understanding the predictors that influence behavioral intention to continued participation in virtual communities. These predictors are incorporated into the research model to examine what drives individuals' continued participation in virtual communities.

III. Research Method

a) *Measures*

The research model in the present study includes seven constructs, and each construct is measured with multiple items. Table 1 presents the operational definitions of the constructs for the research model. The measurement items were adapted from pre-validated measures in the prior literature to enhance content validity (Straub *et al*. 2004). The measurement items were customized for this study to adapt to the virtual community context. All items were measured on a seven-point Likert-type scale ranging from (1) 'strongly disagree' to (7) 'strongly agree.' The English-language measurement items were translated into Korean by the researcher of this study. To ensure the semantic consistency of the original and translated versions of the measurement items, a bilingual English-Korean speaker checked the items by translating them back into English. To ensure the applicability of the questionnaire, a pretest was conducted with seven undergraduate students who had experience participating in virtual communities. The questionnaire was refined based on their comments on the wordings and format of the questionnaire to improve the clarity and understandability. The final measurement items of the constructs and their sources are presented in Table 2.

Table 1 : Operational definitions of the constructs

Construct	Operational definition
Perceived usefulness	The extent to which a person perceives that participating in a virtual community would improve his or her job performance
Perceived ease of use	The extent to which a person perceives that it would be easy to participate in a virtual community
Perceived enjoyment	The extent to which participating in a virtual community is perceived to be enjoyable in its own right, apart from any goals or rewards derived from performance consequences
Social presence	The degree of salience of the other person in the mediated interaction and the consequent salience of the interpersonal relationships in a virtual community
Subjective norm	A person's perception that most people who are important to him think he should or should not participate in a virtual community
Attitude	A person's overall evaluation of participation in a virtual community
Continuance intention	A person's intention to continue to participate in a virtual community

Table 2 : Measurement items and sources

Construct	Measurement item	Source
Perceived usefulness	(1) I find my participation in the virtual community to be useful in my job. (2) Participating in the virtual community improves my performance in my job.	Kim, 2006
Perceived ease of use	(1) It is easy to participate in the virtual community. (2) I feel that the virtual community's interface is easy to learn.	Mäntymäki and Salo, 2011; Wang et al., 2012
Perceived enjoyment	(1) Participating in the virtual community is pleasant. (2) I have fun participating in the virtual community.	Van der Heijden, 2003
Social presence	(1) There is a sense of sociability in the virtual community. (2) There is a sense of human contact in the virtual community.	Gefen and Straub, 2003
Subjective norm	(1) Most people who are important to me think that I should participate in the virtual community. (2) Most people who influence my behavior think that I should participate in the virtual community.	Ajzen, 1991
Attitude	(1) To me, participating in the virtual community is good. (2) To me, participating in the virtual community is valuable.	Chennamaneni, Teng and Raja, 2012
Continuance intention	(1) If I could, I would like to continue my participation in the virtual community. (2) I will try to participate in the virtual community in my daily life.	Bhattacherjee, 2001

b) Data Collection

The data for this study were collected through a Web survey targeting those who have experience participating in virtual communities designed to share information and contents. The questionnaire was posted on a Web-based questionnaire host, where opt-in respondents participated as a panel. The panelists were notified about the study in an email announcement with a hyperlink to access the survey. An email message on the Web survey was sent to the panel, and participants were invited to fill out the questionnaire. The survey was conducted from October 21 to 30 in 2014. The respondents were asked to describe the name of one of the virtual communities they participated in and provide the responses based on their experiences with participation in the virtual community.

A total of 132 responses were collected with some invalid questionnaires, resulting in 127 valid responses. Table 3 presents the results of the frequency analysis conducted to find the characteristics of the respondents. Fifty-two percent of the respondents were male, and 48 percent female. The age of the respondents was largely distributed in their twenties and thirties: 20-29 years old (47.2 percent) and 30-39 years old (37.8 percent). 7.1 percent and 3.1 percent of the respondents were 10-19 years old and 40-49 years old respectively. 4.7 percent of the respondents were over 50 years old. In regards to the occupation of the respondents, 53.5 percent were employees, and 34.6 percent were students. 5.5 percent and 4.7 percent of the respondents were homemakers and independent businessmen respectively. The remaining 1.6 percent did not fall under any of the above categories. In regards to the length of membership in the virtual community, 41.7 percent of the respondents reported having participated in the virtual community for 2-3 years and 40.2 percent reported over 4 years. The remaining 18.1 percent reported having participated in the virtual community for less than one year.

Table 3 : Characteristics of the respondents

Respondent characteristics		Frequency	Percentage
Gender	Male	66	52.0
	Female	61	48.0
Age	10 - 19	9	7.1
	20 - 29	60	47.2
	30 - 39	48	37.8
	40 - 49	4	3.1
	Over 50	6	4.7

Occupation	Student	44	34.6
	Employee	68	53.5
	Homemaker	7	5.5
	Independent businessman	6	4.7
	Other	2	1.6
Length of membership in the virtual community	Less than one year	23	18.1
	2 - 3 years	53	41.7
	Over 4 years	51	40.2
Total		127	100.0

IV. Data Analysis and Results

For the empirical analysis of the data, the descriptive statistics and influential statistics were conducted using SPSS 17.0 and AMOS 5.0. The descriptive statistics and reliability test were conducted using SPSS 17.0. The estimation of the structural equation model for testing the model fit and hypotheses was conducted using AMOS 5.0.

a) Estimation of the Measurement Model

The data were evaluated for reliability and validity, and the validated data set was analyzed using structural equation modeling. To assess internal consistency of the constructs, the reliability of the measures was calculated by using Cronbach's α test. Cronbach's α coefficients greater than 0.70 are considered acceptable (Nunally 1978). All measures demonstrated adequate reliability with Cronbach's α coefficients ranging from 0.806 to 0.895 (Table 4). Thus, all constructs in the research model exhibited good internal consistency as indicated by Cronbach's α coefficients.

Table 4 : Reliability of the measures

Construct	Cronbach's α
Perceived usefulness	0.841
Perceived ease of use	0.806
Perceived enjoyment	0.892
Social presence	0.818
Subjective norm	0.837
Attitude	0.839
Continuance intention	0.895

Confirmatory factor analysis was conducted to test the unidimensionality of the constructs in the research model that are composed of multi-items. Confirmatory factor analysis tests whether the theoretically defined or hypothesized factorial structures of the scales in the measuring instrument under study are valid (Wang and Wang 2012). In this study, the fit indices including the χ^2 statistic, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square residual (RMR), normal-fit index (NFI), and comparative fit index (CFI) were used to evaluate the fit of the measurement model. A value of CMIN/DF (chi-square fit index divided by degrees of freedom) less than 3 indicates an acceptable fit between the hypothetical model and the sample data (Carmines and McIver 1981). The GFI and AGFI are acceptable when the values are greater than 0.90 respectively. A CFI greater than 0.90 indicates a good model fit. The RMR is the square root of the mean of the squared discrepancies between the implied and observed covariance matrices, and it is considered acceptable when the value is less than 0.05. The results of confirmatory factor analysis are presented in Table 5. The fit statistics for the model are as follows: CMIN/DF = 1.467, RMR = 0.037, GFI = 0.922, AGFI = 0.854, NFI = 0.935 and CFI = 0.978. Thus, the results verify that the model fits the data well.

Table 5 : Confirmatory factor analysis of the measurement model

Construct	Measurement item	Standardized factor loading	Standard error	Critical Ratio	AVE	Composite reliability
Perceived usefulness	PU2	0.867			0.939	0.968
	PU1	0.837	0.095	9.719***		
Perceived ease of use	PEOU2	0.776			0.867	0.929
	PEOU1	0.870	0.208	5.269***		
Perceived enjoyment	PEN2	0.916			0.958	0.978
	PEN1	0.879	0.071	13.482***		
Social presence	SP2	0.685			0.863	0.924
	SP1	1.014	0.238	6.830***		

Subjective norm	SN2	0.841			0.936	0.967
	SN1	0.857	0.098	9.957***		
Attitude	ATT2	0.841			0.949	0.974
	ATT 1	0.861	0.078	12.148***		
Continuance intention	CI 2	0.922			0.963	0.981
	CI 1	0.879	0.063	14.386***		

Fit Statistics : CMIN = 87.174, CMIN/DF = 1.467, RMR = 0.037, GFI = 0.922, AGFI = 0.854, NFI = 0.935, CFI = 0.978.
*: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$

The validity of the measures was assessed in terms of convergent and discriminant validity. Convergent validity is defined as "the extent to which multiple attempts to measure the same construct are in agreement" (Campbell and Fiske 1959). Convergent validity of the measures was assessed by using confirmatory factor analysis. To demonstrate convergent validity, the standardized factor loading of each measure should be greater than 0.50 (Fornell and Larcker 1981). As shown in Table 5, all items exhibit high loadings on their corresponding constructs, ranging from 0.685 to 1.014. The analysis of the data verifies that for all measures in the research model, the items measuring the same construct load onto a single factor, thus demonstrating the unidimensionality of the constructs.

In addition, average variance extracted (AVE) is calculated to assess convergent validity. An AVE greater than 0.50, indicating that "50% or more variance of the indicators should be accounted for," supports internal consistency (Chin 1998, 321). The AVE measures of the constructs range from 0.863 to 0.963, exceeding the minimum required level (Table 5).

Discriminant validity refers to "the degree to which items differentiate among constructs or measure distinct concepts" (Igbaria and Iivari 1995, 596). Discriminant validity was assessed by comparing the interconstruct correlations and the square root of the AVE. To demonstrate discriminant validity, the square root of the AVE should be greater than the interconstruct correlations, indicating that "the constructs are correlated more highly with their indicators than with other constructs in the model" (Igbaria, *et al*. 1995, 102). As presented in Table 6, the square root of the AVE for all constructs (in diagonals) is greater than the inter construct correlations (off-diagonals), indicating that all the constructs meet the criteria for adequate discriminant validity.

Table 6 : Interconstruct correlations

Construct	M±SD	1	2	3	4	5	6	7
1. Perceived usefulness	4.94±1.013	.969						
2. Perceived ease of use	5.56±0.839	.326***	.931					
3. Perceived enjoyment	4.89±1.004	.512***	.302**	.979				
4. Social presence	4.55±0.998	.423***	.163	.535***	.929			
5. Subjective norm	4.30±1.113	.427***	.097	.568***	.481***	.967		
6. Attitude	4.96±0.934	.591***	.173	.736***	.475***	.679***	.974	
7.Continuance intention	5.09±0.978	.666***	.311***	.661***	.473***	.510***	.773***	.981

$^{**}p < 0.01$, $^{***}p < 0.001$

Note. Square root of the average variance extracted shared between the constructs and their measures (in diagonals); interconstruct correlations (off-diagonals).

b) Estimation of the Structural Model

The structural model was tested to examine the relationships between the constructs in the research model. The results of the structural model estimation are presented in Table 7. The overall fit statistics verifies that the hypothesized model provides a good representation of the structures that underlie the observed data (CMIN/DF = 1.698, RMR = 0.047, GFI = 0.904, AGFI = 0.834, NFI = 0.918, and CFI = 0.964).

Hypothesis 1 specified a positive direct relationship between attitude and continuance intention. The results indicate that a significant positive effect of attitude on continuance intention (path coefficient = 0.932; $p < 0.001$), in support of Hypothesis 1. Hypothesis 2 proposed a positive direct relationship between perceived usefulness and attitude. For the relationship between perceived usefulness and attitude, the results support that perceived usefulness provides a significant predictor of attitude (path coefficient = 0.290; $p < 0.001$), in support of Hypothesis 2. Hypothesis 3, which specified the relationship between perceived ease of use and attitude, is not supported. Hypothesis 4 proposed a positive direct relationship between perceived enjoyment and attitude. The results support the significant positive relationship between perceived enjoyment and attitude, as specified in Hypothesis 4

(path coefficient = 0.425; p < 0.001). On the other hand, the effect of social presence on attitude is not statistically significant (Hypothesis 5), indicating that social presence is not a significant determinant of attitude toward participation in virtual communities. Hypothesis 6, which specified the relationship between subjective norm and attitude, is supported, indicating that subjective norm is a significant determinant of attitude (path coefficient = 0.228; p < 0.01). The results of path coefficients and path significance for the model are shown in Figure 2.

Table 7 : Results of hypotheses test

Hypothesis	Path	Estimate	Standard error.	Critical ratio	p
H1	Attitude → Continuance intention	0.932	0.091	10.291***	0.000
H2	Perceived usefulness → Attitude	0.290	0.074	3.921***	0.000
H3	Perceived ease of use → Attitude	-0.049	0.079	-0.612	0.540
H4	Perceived enjoyment → Attitude	0.425	0.087	4.868***	0.000
H5	Social presence → Attitude	-0.022	0.083	-0.271	0.786
H6	Subjective norm → Attitude	0.228	0.076	2.981**	0.003

Fit Statistics: CMIN = 103.554, CMIN/DF = 1.698, RMR = 0.047, GFI = 0.904, AGFI = 0.834, NFI = 0.918, CFI = 0.964
***: p < 0.01 ***: p < 0.001*

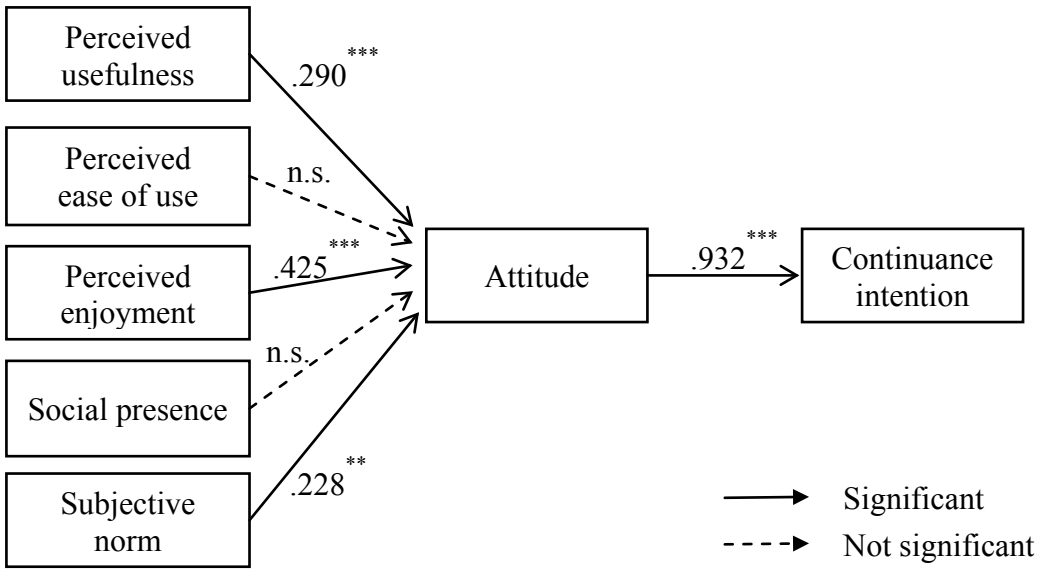

Fig. 2 : Structural model results

V. Discussion

To enhance our understanding of what drives people to continue to participate in virtual communities, this study investigated how the antecedents affect behavioral intention to continued participation. The results obtained from the present study indicate that attitude is positively associated with individuals' behavioral intention to continued participation. It is suggested that attitude toward participating in virtual communities is a significant predictor of continuance intention. The findings support previous studies that reported a significant positive relationship between attitude and behavioral intention (Ajzen and Fishbein 1980; Bhattacherjee and Premkumar 2004; Ho *et al*. 2011).

In the present study, perceived usefulness was found to have a significant influence on attitude, suggesting that perceived usefulness exerts a positive impact on attitude toward participation in virtual communities. The positive effect of perceived usefulness on attitude implies that individuals are likely to form positive attitude toward participation in a virtual community when they perceive it to be useful to them. In the context of virtual community, participants tend to perceive it useful when they can obtain valuable information and services that can help them enhance their performance (Lin 2009) Considering that perceived usefulness is a significant determinant of attitude, it is recommended to promote positive beliefs about the utility of virtual communities by facilitating the environment in which participants can share informative contents and build positive relationships. Thus, for a virtual community to be sustainable, it is important to provide contents and services that are valuable and useful to the members on an ongoing basis (Koh, *et al*. 2007).

On the other hand, perceived ease of use was not found to be positively associated with attitude. The results suggest that perceived ease of use is not a significant determinant of attitude toward participation. A possible explanation for lack of significant influence of ease of use on attitude found in this study may lie in the moderating effect of length of membership in a virtual community. Ease of use may not exert a significant influence on participants' attitudes once they became familiar with the interfaces of the virtual community in the post-adoption stage. Further research can be pursued to examine possible moderating effects of length of membership in virtual communities.

The strongest influence on attitude was found for perceived enjoyment. The strong influence of perceived enjoyment implies that participants will build favorable attitude toward participation in virtual communities if they perceive it to be enjoyable in its own right, apart from any goals or rewards derived from performance consequences. The importance of perceived enjoyment as an intrinsic motivator in system usage has been emphasized in previous studies (Davis *et al*. 1992; Deci and Ryan 1987; Van der Heijden 2004). Given the significance of perceived enjoyment as an influence on participants' attitudes found in the present study, it is suggested that practitioners need to provide hedonic features in virtual communities to facilitate continued participation. In addition to reinforcing the utility of the contents and services shared in the virtual communities, enjoyable and fun features should be provided to facilitate individuals' continued participation.

Social presence was not found to be significantly associated with attitude, indicating the lack of positive influence of social presence on attitude toward participation. A possible explanation for this lack of significant effect may lie in a limited impact of social presence on user perception. In a study to test whether social presence elements increase website use, Crutzen *et al*. (2013) reported a limited impact of social presence elements on actual website use. They found that even though social presence elements attract attention, the frequency and duration of fixations on the social presence elements were limited in comparison with fixations on the main text. Shen *et al*. (1996) point out that different dimensions of social presence may elicit different psychological and/or social psychological process, thus influencing motivation and subsequent virtual community participation in different ways. It is argued that multi-dimensional conceptualizations of social presence need to be adopted to understand its effects on virtual community participation. Further research may investigate how different channels exert distinct influences on the effect of social presence on virtual community participation.

In the present study, subjective norm was found to have a significant positive influence on attitude, indicating that subjective norm is an important predictor of attitude toward participation in virtual communities. The results suggest that if people important to a person recommend him to participate in a virtual community, it is likely to influence his attitude toward participation. It implies that individuals' perceptions of social pressure from important referent groups exert significant influences on attitude toward community participation, which in turn affects continuance intention. Given that individuals' perception of whether the participation is encouraged by their circle of influence is an important predictor of their attitude, positive comments are considered crucial in promoting virtual communities.

VI. Conclusion

This study examined what motivates individuals to continue to participate in virtual communities in the post-adoption stage. An integrated model that incorporated the antecedents of individuals' behavioral intention to continued participation was empirically tested to identify key predictors of individuals' continuance intention. The findings from the present study may provide insights into effective strategies to vitalize virtual communities.

The findings suggest that attitude predicts behavioral intention to continued participation and mediates the effects of its antecedents on continuance intention. Among the antecedents of attitude, perceived enjoyment was found to exert the strongest influence on attitude toward participation. Perceived usefulness and subjective norm were identified as significant determinants of attitude. Overall, the theoretical model in the present study received empirical support and provided a foundation for further study of what motivates individuals to contribute their resources to virtual communities and benefit from them, thus enabling the viability of virtual communities.

Individuals' continued participation in virtual communities cannot be forced. Instead, it is necessary to build a facilitative environment to vitalize the virtual communities. By identifying motivational drivers influencing individuals' intentions to continue to participate in virtual communities based on empirical evidence, the present study contributes to improve our understanding of what should be preceded to facilitate the vitality of virtual communities.

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