An empirical analysis of Relationship Commitment and Trust in Virtual Programmer Community

Yu-Ren Yen

Abstract—Virtual Communities (VCs) have become a forum for programmer seeking knowledge to resolve problems and communicate with each other. The Internet makes participant relatively easy to switch for one VC to another VC that provides similar content or services. However, many VCs have failed due to the reluctance of members to continue their participation in these VCs. In volatile cyberspaces, VCs without specific domain knowledge may face challenges such as large populations, unstable memberships, and imperfect information and memory, which also affect knowledge flows within members. The most important aspect of VCs from the members' perspective is the increase satisfaction, and engage behavioral intention to use VCs, but satisfaction does not always predict continuous usage. This study proposes a conceptual model based on commitment-trust theory (CTT) and investigates the continuance intention in VC. It seeks to theorize the antecedents and consequence of relationship commitment in the VCs and identify how CTT can be adapted in a knowledge sharing environment. The members of Programmer Club, a representative professional community in Taiwan, were chosen to participate in the survey, and 488 usable responses were collected in three months. Structural Equation Model (SEM) was used to test the model, the findings show that relationship commitment and trust is the strongest predictor of members' continuance intention. Implications are proposed in the final section.

Keywords— Commitment-trust Theory, Relationship Commitment, Virtual communities, Knowledge Sharing, Trust, Share value, Relationship Benefit, Relationship Termination Cost, Communication, Opportunistic Behavior.

I. INTRODUCTION

Virtual Communities(VCs) have become a forum for programmer seeking knowledge to resolve problems and communicate with each other. The Internet makes participant relatively easy to switch for one VC to another VC that provides similar content or services. In volatile cyberspaces, VCs without specific domain knowledge may face challenges such as large populations, unstable memberships, and imperfect information and memory, which also affect knowledge flows within members [1]. A large number of new virtual communities are not well-accepted by individuals. Thus,

it is important to find out the expectations of individuals towards visiting and revisiting behaviors [2]. The most important aspect of virtual communities (VCs) from the members' perspective is the increase satisfaction, and engage behavioral intention to use VCs [3],[4],[5],[6]. However, satisfaction does not always predict continuous usage [7]. If a number has many available choices, satisfaction will not always keep him or her from switching to other VCs. Recently, much research has investigated the members' commitment to continuous use is critical to venders [8],[9],[10],[11]. Relationship commitments adopt form Morgan and Hunt (1994) as an enduring desire to maintain a valued relationship. In organizational context, commitment is seen as central because it not only leads to such important outcomes as decreased turnover, higher motivation, and increased organizational citizenship behaviors [9]. In this study, we investigate the role of relationship commitment in members' behavioral intention to continue use a VC in a voluntary content. It seeks to theorize the antecedents and consequence of relationship commitment in the VCs and identify how commitment-trust theory (CTT)[9] can be adapted in a VC environment.

The remainder of this article is organized as follows: First, we review competing literatures which are widely used with commitment-trust theory. Second, the research model is proposed and the corresponding hypotheses are listed. Third, the research methodology is discussed, and the fitness of the proposed model is then assessed using Partial Least Square (PLS) regression, following the finding and discussion. Finally, implications of the study to both researchers and practitioners are discussed.

II. THEORETICAL BACKGROUND

A. Virtual Community and Relationship Commitments

Relationship development is one of the four needs – information, transaction, fantasy, and relationship – driving the formation of a VC [12] and it occurs when members participate and interact with one other long enough with sufficient human feeling. However, though participation may lead to relationship development, it dose not guarantee the formation of relationship, not to mention strong relationship. If bad experience is encountered during participation and interaction with the others, relationship will not be developed [11].

Commitment to a relationship explains an individual's

positive attitude toward a social or exchange knowledge relationship and his motivation to remain in the relationship. This is important because VC is a kind of online social networks in which people with common interests, goals, or practices interact to share information and knowledge, and engage in social interactions [2]. It offers several ways for members to interact, collaborate, and trade. Commitment is the most direct and powerful predictor of persistence in a relationship. Highly committed individuals feel strongly dependent on their partners and the relationship. They have a long-term orientation toward relationships that they expect to develop further in the future [7].

Relationship commitment is an exchange partner believing that an ongoing relationship with another is so important so to warrant maximum effects at maintaining it; that is, the committed party believes the relationship is worth working on to ensure that it endures indefinitely [9].

B. Commitment-Trust Theory

This study is grounded in the well-known commitment-trust theory of relationship marketing, originally proposed by Morgan and Hunt [9]. According to the theory, Commitment and trust are central to successful relationship marketing, because they encourage marketers to (1) work at preserving relationship investments by cooperating with exchange partners, (2) resist attractive short-term alternatives in favor of the expected long-term benefits of staying with existing partners, and (3) view potentially high-risk actions as being prudent because of the belief that their partners will not act opportunistically [9].

Morgan and Hunt [9] developed the key mediating variable (KMV) model of relationship marketing. The KMV model positioned commitment and trust as mediating variables between five antecedents (relationship termination cost, relationship benefits, shared values, communication, and opportunistic behavior) and five outcomes (acquiescence, propensity to leave, co-operation, functional conflict, and decision making uncertainty)(Fig.1).
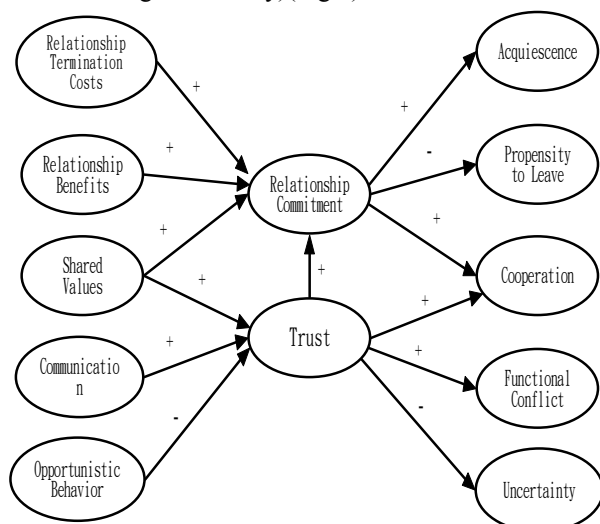

Figure 1. The KMV Model of Relationship Marketing
(Adopt form Morgan and Hunt,1994,p.22)

According to the KMV model, the more losses that are expected of a relationship termination, the more committed the different parties will be to each other. A terminated party will seek an alternative relationship and have switching costs, which lead to dependence. Relationship termination costs are exacrbated by idiosyncratic investments. Those are difficult to switch to another relationship. Termination costs are all expected losses form termination and result from the perceived lack of comparable potential alternative partners, relationship dissolution expenses, and/or substantial switching costs. Because partners that deliver superior benefits will be highly valued, firms will commit themselves to establishing, developing, and maintaining relationships with such partners. Morgan and Hunt [9] posit that firms receive superior benefits from their partnership, relative to other options, such as product profitability, customer satisfaction, and product performance, will be committed to the relationship. When exchange partners share the same values, commitment to the relationship will increase. Shared values are the extent to which partners have beliefs in common about what behaviors, goals, and policies are important or unimportant, appropriate or inappropriate, and right or wrong. Morgan and Hunt [9] posit that when exchange partners share values, they indeed will be more commitment their relationships. Trust is affected by the communication between the exchanging parts. Communication, the formal and informal sharing of information through frequent two-way dyadic interchanges, also plays an important role in realizing the benefits from a relationship. Morgan and Hunt [9] posit that a partner's perception that past communications from another party have been frequent and of high quality, such as relevant, timely, and reliable information, will result in greater trust. Opportunistic behavior refers to any violation of promises about a party's appropriate or required behavior perceived by another party in a relationship. When individuals try to maximize their own outcome (i.e., opportunistic behavior) at the expense of others, trust will decrease.

Trust exits when one party believes that the other is trustworthy and is confident about the other party's future behavior. Trust has a positive impact on and is a major determinant of relationship commitment [7]. Why individual continues to transfer their expertise to someone they don't know? One possible reason is that sharing behavior is the only way to maximize her or his utility and minimize the costs to gain needed knowledge in VCs. Perhaps a sense of commitment could be developed in during participation and interaction with the others.

C. Relationship Commitments Literature Review

Commitment theories suggest that a decision maker continues a line of actions to reflect an affective bond with the actions, to avoid losing various investments associated with earlier actions, and/or to justify that his or her earlier decision was right [8]. Thus, the notion of commitment captures a broader view of the forces driving a participant's continuous actions.

Table 1 summarizes relationship commitments adopted in this study to explain participants' willingness to continue use in

a particular virtual community. Commitment theories are also distinguishable form other attitude, cognition, and motivation theories. Thus, a commitment perspective represents a departure form popular views widely adopted in previous technology adoption/acceptance literature, such as technology acceptance model (TAM)[13],[14], theory of planned behavior (TPB)[15],[16], and IS continuance Model[2].

Table 1：Relationship Commitments Literature Review

Authors	Context	Method	Findings
Li et al. [7]	USA Electronic Commerce	Survey /SEM(PLS -Graph)	Commitment→ Stickiness intention; Trust→Stickiness intention; Trust→ Commitment; Quality of alternatives →Commitment; Investment→ Commitment; Satisfaction→ Commitment; Satisfaction→Trust; Communication →Trust; Opportunistic →(-) Trust
Li et al. [8]	USA Electronic Commerce	Survey /SEM(Lisrel)	Affective commitment →Behavioral intention; Calculative commitment →Behavioral intention; Quality of alternatives →(-)Affective commitment; Quality of alternatives →(-)Calculative commitment; Quality of alternatives →(-)Behavioral intention; Trust→Affective commitment; Trust→Calculative commitment.
Mukherlee & Nath [10]	UK online retailing	Survey /SEM(LISREL)	Trust→Commitment Share Value→ Commitment; Communication →Trust; Opportunistic→(-) Trust; Privacy→Trust; Security→Trust; Share Value→Trust; Commitment→ Behavioral intention; Trust→ Behavioral intention
Jang et al. [11]	Korea Electronic Commerce	Survey /SPSS	Commitment→Brand Loyalty; Interaction→ Commitment; Reward→Commitment; The hosting type of a community has moderating effect and that community commitment increases brand loyalty.
Yap and Bock [17]	Relationship development in VC	Hypotheses framework	Public resources→ Affective commitment; VC Cohesion→ Affective commitment; VC Cohesion→ Public resources; Size of VC→ Public resources; Size of VC→(-)VC Cohesion.
Vatanasombut et al.[18]	USA online Banking	Survey /SEM(Amos)	Commitment→(-) Customer Retention; Trust→(-) Customer Retention; Trust→ Commitment; Relationship Termination Cost →Commitment; Perceived Empowerment →Commitment; Communication →Trust; Security→Trust.
Bateman, Gray, and Butler [19]	USA BroadForum	Survey /SEM(PLS -Graph)	Affective Commitment →Community Citizenship Behaviors; Affective Commitment →Content Provision; Normative Commitment →Community Citizenship Behaviors; Continuance Commitment →Content Provision; Continuance Commitment →Audience Engagement

Note: →is positive impact; →(-)is negative impact

III. MODEL DEVELOPMENT AND RESEARCH HYPOTHESES

As shown in Fig.2, this study based on commitment-trust theory with modify constructs derived form VCs context. The dependent variable is an individual's behavioral intention to continuous use the VC. Using behavioral intention in the investigation of commitment has been justified in many prior studies [7],[8],[10],[11],[18],[19].

Prior studies indicate that a decision maker continues a line of actions to reflect an affective bond with the actions, to avoid losing various investments associated with earlier actions, and/or to justify that his or her earlier decision was right[8]. Therefore, the model focuses on intention to continue use VC is

posited directly influence by relationship commitment and trust, and the antecedents (relationship termination costs, relationship benefits, shaved values, communication, and opportunistic behavior). This leads the following hypotheses.

H1: Relationship commitment positively affects continuance intention in a VC.

H2: Trust positively affects continuance intention in a VC.

H3: Trust positively affects relationship commitment in a VC.

H4: Relationship termination costs positively affect relationship commitments in a VC.

H5: Relationship benefits positively affect relationship commitment in a VC.

H6: Shaved values positively affect relationship commitment in a VC.

H7: Shaved values positively affect trust in a VC.

H8: Communications positively affect trust in a VC.

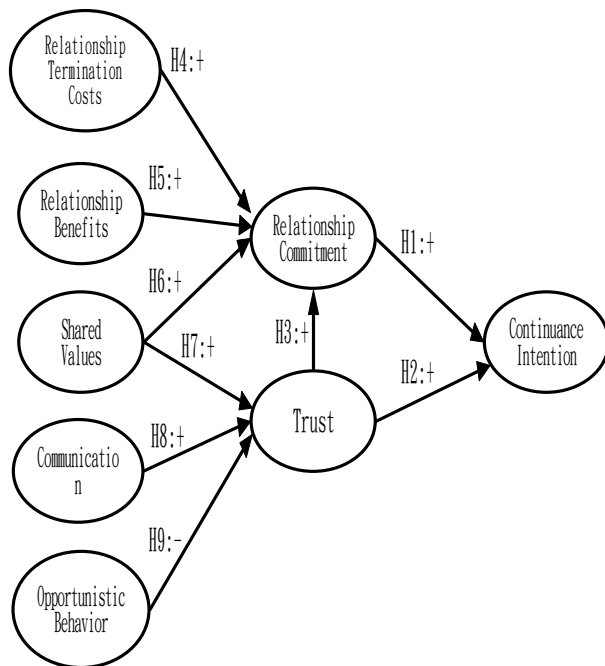H9: Opportunistic behaviors negatively affect trust in a VC.

Figue2. Research Model

IV. RESEARCH METHODOLOGY

The research model was tested with data from members of one virtual community called Programmer Club (http://www.programmer-club.com/index.asp). It is a well-known IT-oriented virtual community in Taiwan. Programmer Club was founded in April 2000; it had over 185,000 registered members by the end of Oct. 2008. A banner with a hyperlink connecting to our web survey was posted on homepage of Programmer Club from July 1 to September 30, 2008 and the members with knowledge sharing experience were cordially invited to support this survey. A number of respondents will be randomly selected for offering incentive payments amounting to US$10. This is done for increasing the incentives of participants and the quality of questionnaires. Of

the 653 surveys received back, 488 were fully completed and usable for the purpose of this study.

The respondents were a diverse sample: 20% of the respondents were female; 80% were male. Their age ranged from 18 to over 45 years old, with 22%, between 18 to 25 years old, with 30.7% between 26 and 30 years old, with 27.5% between 31 to 35 years old, with 10.9% between 36 to 40 years old, and with 9% over 40 years old. Their Programmer Club history ranged from one month to over 4 years, with 30% between one month to one year, and with 24.2% between one year to two years, and with 21.7% between two years to three years, and with 23.6% over three years. More than 98% had a college degree, 43.9% of the respondents reported they are programmers. No significant differences between the answers from different classes were found, so all the responses were pooled together in a single sample.

Measurement items were adapted from the literature wherever possible. Based on Morgan and Hunt [9], minor modifications were made to fit the specific context of VC. New items were developed based on the definition provided by the literature. Specifically, continuance intention was measured using scales adapted from Bhattacherjee [20]. Relationship commitment was measured using scales adapted from Morgan and Hunt [9], Bateman et al. [19]. Trust was measured using scales adapted from Chiu et al. [21] and Hsu et al.[4]. Relationship termination costs were measured using scales adapted from Burnham et al.[22]. Relationship benefits were measured using scales adapted from Gwinner et al. [23]. Shaved values were measured using scales adapted from Chiu et al. [21]. Communication and Opportunistic behavior were measured using scales adapted from Morgan and Hunt [9]. All scales were reflective. The items used in the study are listed in Table 2. The attributes were then summarized to create a survey instrument, which asks respondents to identify the extent to which they agree/disagree with respect to their experience with usage on Programmer Club. Each item was rated on a five-point Likert scale, ranging form "strongly disagree"(1) to "strongly agree" (5).

Before conducting the main survey, we performed both a pre-test and a pilot to validate the instrument. Pretests were conducted to ensure the instrument is acceptably valid. The instrument was first evaluated for content validity by three IS/KM scholars, and then further tested for reliability, item consistency, ease of understanding, and question sequence appropriateness. Fifty friends who have taken Programmer Club were asked to complete the questionnaire. Comments on question sequence, wording choice, and measures were solicited, leading to minor modifications of the questionnaire. Based on feedback from pilot test, several items were removed from our instrument.

Table2 Summary of measurement scales

Construct	Item measures	Loading	C.R
Relationship	I get faster service than other VCs.	0.81	0.89

Construct	Item	Loading	C.R.
	Sharing my knowledge through this VC improves others recognition of me.	0.82	
	When I share my knowledge through VC, I believe that my queries for knowledge will be answered in future.	0.74	
	I have developed a friendship with the other members.	0.81	
Relationship Termination Costs (formative indicators)	Learning to use the features offered by a new VC as well as I use my service would take time.	0.81	0.88
	Switching to a new VC would mean losing or replacing points, credits, services, and so on that I have accumulated with this VC.	0.79	
	I will lose benefits of being a long-term number if I leave this VC.	0.83	
	I am more comfortable interacting with the people working for this VC than I would be if I switched new VC.[r]	0.80	
Shared Values (reflective indicators)	Members in this VC use understandable narrative forms to post messages or articles.	0.82	0.90
	Members in this VC share the same goal of learning from each other.	0.86	
	Shared values are the extent to which members have beliefs in common.	0.86	
	Members in this VC share the same values that helping others is pleasant.	0.79	
Communication (formative indicators)	In our relationship, my favorite members communicate well those expectations for knowledge sharing.	0.81	0.87
	In our relationship, my favorite members provide me with frequent positive feedback.	0.83	
	In our relationship, my favorite members keep me informed of new developments.	0.82	
	In our relationship, my favorite members offer me very well recognition knowledge.	0.72	
Opportunistic Behavior (formative indicators)	To share knowledge, sometimes those members are opportunist.	0.91	0.92
	Sometimes those members promise to do things without actually doing them later.	0.89	
	Sometimes those members fail to provide us with the support that he is obligated to.	0.86	
Relationship Commitment (reflective indicators)	I have a real emotional attachment to this VC.	0.79	0.91
	I feel like a part of the group at this VC.	0.79	
	This VC deserves my loyalty.	0.84	
	I keep coming to visit this VC because I have a sense of obligation to it.	0.77	
	I am share that there are other VCs where I could find the same content that I get at this VC. [r]	0.74	
Trust (reflective indicators)	In this VC, those members are always faithful.	0.82	0.92
	In this VC, those members have high integrity.	0.79	
	In this VC, those members are perfectly honest and truthful.	0.85	
	I can talk freely to the community members about my personal issues.	0.82	
Continuance Intention (reflective indicators)	I intend to continue using this VC in the future.	0.87	0.92
	I plan to keep using this VC in the future.	0.89	
	I will continue using this VC in the future.	0.87	

Note: [r] is reverse-scored, C.R. is composite reliabilities.

V. DATA ANALYSIS AND RESULTS

A. Statistical analysis method

The study used partial least squares (PLS) as the statistical analysis method. PLS is a component-based estimation method used to analyze causal models. Like LISREL, PLS allows simultaneous examination of the measurement model and structural model. PLS enables a simultaneous analysis of 1) how well the measures relate to each construct and 2) whether the hypothesized relationships at the theoretical level are empirically confirmed. PLS can also handel both reflective and formative scales, whereas LISREL lacks a good approach for modeling formative indicators. In this study, Our indicatos include reflective indicaters and formative indicatos, such as relationship benefits, relationship termination costs, and opportunistic behavior. Thus, Thus, PLS-Graph 3.00 [24] was used, following a two-step analysis approach.

We conducted tests of significance for all paths using the bootstrap resampling procedure and the standard approach for evaluation that requires path loadings form construct to measures to exceed 0.70. For checking internal consistency, we relied on composite reliability measures as suggested by Chin [24][25] and by examining cross-loadings of the constructs(see appendix A).

B. Measurement model

The measurement model was evaluated in terms of convergent validity and discriminate validity. Factor loadings λ in the study exceeded 0.7 (see Table 2), which represents the measure model is significant due to high convergent validity. Composite reliabilities in the measurement model ranged from 0.87 to 0.92 (see Table 2) and were all above the minimum of 0.7 as suggested by Nunnally [26].

Discriminate validity of reflective scales was assessed by comparing the Average variance extracted (AVE) of each individual construct with the shared variances between a single individual construct than all the others constructs. All the interconstruct correlations are shown as elements off the diagonal of the matrix in Table 3. Square roots of AVEs are shown on the diagonal.

Table 3 Correlations and AVE

Var.	AVE	RB	RTC	SV	CO	OP	RC	TRU	CI
RB	0.64	**0.80**	-	-	-	-	-	-	-
RTC	0.66	0.78	**0.81**	-	-	-	-	-	-
SV	0.69	0.73	0.66	**0.83**	-	-	-	-	-
CO	0.63	0.68	0.63	0.62	**0.79**	-	-	-	-
OP	0.79	-0.30	-0.32	-0.27	-0.24	**0.89**	-	-	-
RC	0.60	0.69	0.66	0.59	0.51	-0.22	**0.77**	-	-
TRU	0.66	0.70	0.71	0.61	0.60	-0.36	0.63	**0.81**	-
CI	0.74	0.61	0.57	0.55	0.53	-0.20	0.74	0.61	**0.86**

*AVE=average variance extracted;

RB=Relationship Benefits;
RTC=Relationship Termination Costs;
SV=Shared Values; CO=Communication;
OP=Opportunistic Behavior;
RC=Relationship Commitment; TRU=Trust;
CI=Continuance Intention.

For discriminate validity, diagonal elements should be larger than off-diagonal elements. The AVE for each scale, which measures the average amount of variance that a construct captures from its indicators relative to the amount due to measurement error. All scales exceeded Chin's [24 guideline of 0.5, meaning that at least 50% of variance in indicators was accounted for by its respective construct (see Table 3).

Comparing all the correlations and the elements on the diagonal, the results demonstrate adequate discriminate validity for all the reflective constructs. In summary, the measurement model demonstrated adequate reliability, convergent validity, and discriminant validity.

C. Structural model and hypotheses testing

This study selected PLS for data analysis because of the use of noninterval scales, the absence of multivariate normality, and the small sample size. The ability to detect and accurately estimate the strength of interaction effects are critical issues that are fundamental to social science research in general and IS research in particular. As shown in Figure 3, all the hypotheses were supported. Relationship commitment is the strongest predictor of numbers' behavioral intention in a VC, followed by trust as a significant but weaker predictor. Apart from the re-examination of commitment-trust theory in the online retail context [10], our study attempts to make original contribution in understanding online participant behavior. Participants' relationship commitment plays a key role in success of any virtual communities. We find that generating shared values, regular communication, and trust which help to better understand participant revisit intention for a volatile cyberspace.

Since PLS does not generate an overall goodness of fit index, one primarily assesses validity by examining the R^2 of the endogenous constructs and the structural paths. The variance in intention explained (R^2) in this study was 59%; in the studies of Bhattacherjee[20], Chiu et al.[21], and Jang et al.[11], they were 41%, 48%, 49%, respectively.

Hypothesis H1-H2 were supported and implied that both commitment and trust have significant influence on participants' continuance intention. Commitment to a relationship explains an participant's positive attitude toward a social or business relationship and his motivation to remain in the relationship [8]. This is important because VC use have become a forum for people seeking knowledge to resolve problems and communicate with each other. An online participant does not ignore his previous decision in the initial adoption of VC and various subsequent resources invested in his past use of VC [2]. During this series of decisions, a commitment to the VC emerges and works as a social

mechanism or psychological bond for maintaining the relationship. The problem of continuance intention, which has been focused mainly on human-computer interaction, has thus been extended in this study to the broader context of relationships between participants and each other.

Previous research has posited trust as significant positive relationship with relationship commitment [7],[8],[9],[10]. Consistent with previous studies, Hypothesis H3 was supported and implied that participants trust the relationship with other members, the more likely he or her is to be attached to the relationship.

Hypothesis H4-H9 were supported and implied that the antecedents of relationship commitment (relationship termination costs, relationship benefits, shaved values, communication, and opportunistic behavior) had significant effects on members' relationship commitment ($R^2=0.54$) and trust ($R^2=0.48$). Relationship benefits have very high positive impact on relationship commitment. Morgan and Hunt [9] found no support for their hypothesis of positive relationship between relationship benefits and commitment. They attributed this result to their comparative measure of relationship benefits, which required respondents to evaluate the benefits of suppliers compared to the alternatives. Our measures adapted from Burnham et al.[22] including procedural switching costs, benefit loss costs, and relational switching costs. Those benefits exist in all VCs at varying level, lend support to the positive relationship between relationship benefits and relationship commitment.
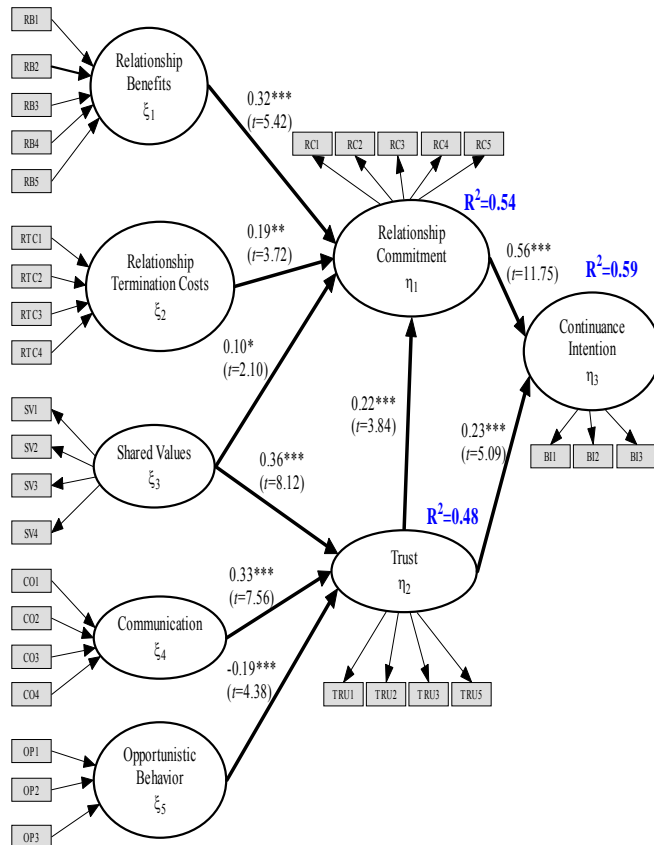

Figure 3. PLS Model Results

D. The Split Sample

Relationship commitments adopt form Morgan and Hunt (1994) as an enduring desire to maintain a valued relationship. In this study, we investigate the role of relationship commitment in members' behavioral intention to continue use a VC in a voluntary content. It seeks to theorize the antecedents and consequence of relationship commitment in the VCs and identify how commitment-trust theory can be adapted in a VC environment. Referring to the Kozinets [27] approach, the frequency of interaction within communities may associate with different perceptions toward communities. We emphasize difference participant choose to join VCs with different purposes, motivation, and stay with different tenure. In considering the different types of virtual communities of consumption and their different members, the roles of relationship commitment and trust are diversiform.

The spited sample was selected by the degree of commitment and trust (low or high commitment, low or high trust), and each was tested separately. As shown in Table 4, it seems obvious, that degree of commitment and trust had a significant moderating effect on the research hypotheses.

Table 4: Path Coefficients and their T-value

	HC-HT N=180	HC-LT N=31	LCLT N=84	LCHT N=74
H1	0.37***	0.29[n.s.]	0.31*	0.62***
H2	0.34***	0.42[n.s.]	0.43***	0.11[n.s.]
H3	0.27**	-0.41[n.s.]	0.05[n.s.]	0.05[n.s.]
H4	0.15[n.s.]	0.14[n.s.]	0.40*	0.21[n.s.]
H5	0.07[n.s.]	0.51*	0.09[n.s.]	0.32[n.s.]
H6	0.21*	-0.01[n.s.]	0.08[n.s.]	-0.22[n.s.]
H7	0.30***	0.18[n.s.]	0.17[n.s.]	0.27[n.s.]
H8	0.23**	0.35[n.s.]	0.46***	0.08[n.s.]
H9	-0.14[n.s.]	0.42[n.s.]	-0.18[n.s.]	-0.45**

*p<0.05,**p<0.01,***p<0.001,n.s.=nosignificant
HC-HT:higher commitment and higher Trust group
HC-LT:higher commitment and lower Trust group
LC-LT:lower commitment and lower Trust group
LC-HT:lower commitment and higher Trust group

For higher commitment and higher trust group, as shown in Figure 4, the paths from relationship commitment to behavior intention, trust to behavior intention, and trust relationship commitment are both significant. Specially, social and psychological factors (such as trust, share values, and communication) have significant effects on relationships commitment in this group. Relationship benefits, relationship termination costs and opportunistic behavior were not significant. In this group, as for paths form the antecedents to relationship commitment and trust, we found that the strong impacts of social and psychological factors. This results support Chiu et al.[21] argument that social capital (such as social interaction ties, norm of reciprocity, trust, identification, and shared vision) are helpful in explaining knowledge sharing in VCs.
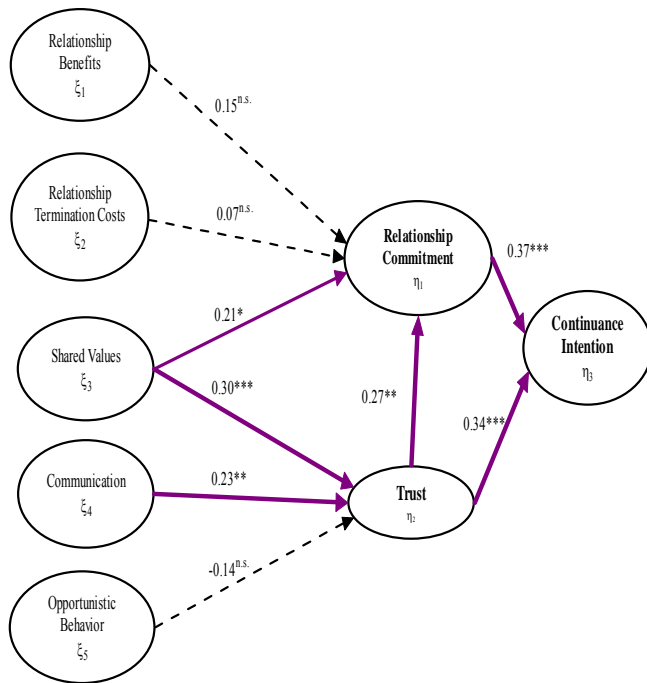
Figure 4. Higher commitment and higher Trust group
PLS Model Results

For lower commitment and lower trust group, as shown in Figure 5, the paths from relationship commitment to behavior intention and trust to continuance intention are both significant. Social and psychological factors (such as trust and share values) have not significant effects on relationships commitment in this group.
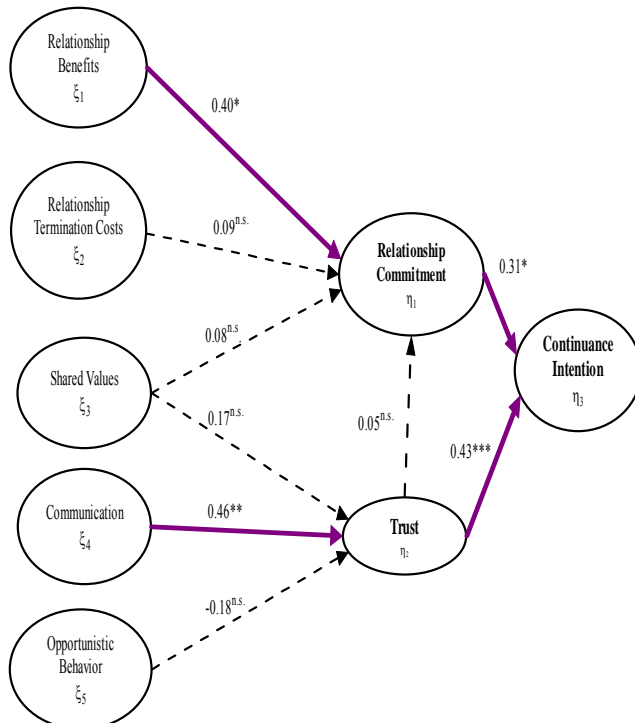

Figure 5. Low commitment and Low Trust group
PLS Model Results

VI. CONCLUSION

The major objective of this study was to re-examine the commitment-trust theory proposed by Morgan and Hunt [9] in the virtual communities. We developed different sets of measures for the antecedents and consequences of commitment and trust, i.e. relationship termination costs, relationship benefits, and opportunistic behavior in VC. Relationship commitment and trust act as key mediator variables which significantly affect the participant continuance intention. Thus, in considering the different types of virtual communities of consumption and their different members, the roles of relationship commitment and trust are diversiform. We test the moderating effect of relationship commitment and trust. The full sample was split into four groups and compare with the results of PLS model results. This study makes three contributions to VC research.

First, continuance intention are positively affected by higher level of relationship commitment, and are positively affected by higher values of trust direct and indirect. We investigate the role of relationship commitment in members' continuance intention to continue use a VC in a voluntary content. Based on our findings (Table 4), in the case of lower commitment and lower trust, the commitment was found to be significantly influenced by the transitional factor (relationship benefit). Thus, in the case of higher commitment and higher trust, the commitment was found to be significantly influenced by the social factor (shared value, trust).

Second, three social and psychological factors are important antecedents of relationship commitment of the virtual community. From a practical standpoint, the VC venders need to pay special attention to social capital in VC, emphasizing social usefulness. Vendors can conduct offline events and product related contests to enhance interaction in the VC. Members come together online and through interaction become committed to the VC. Chiu et al. [21] integrated the social cognitive theory and the social capital theory for investigating the motivations behind participants' knowledge sharing in VCs, and suggest that outcome expectations and facets of social capital are helpful in explaining knowledge sharing in VCs. Following Nahapiet and Ghoshal [28], and Tsai and Ghoshal [29], the structural dimension of social capital is manifested as social interaction ties, the relational dimension is manifested as trust, norm of reciprocity and deification, and cognitive dimension is manifested as shared vision. Our findings suggest that shared vision is significant determinant of commitment and trust. It enhances the feeling of association, develops bonding and builds long-term relationships. Within shared values, maintaining highest level of ethics in all business transactions is the most significant issue [10].

Finally, participants can decrease their trust and relationship commitment through opportunistic behavior. To share knowledge, sometimes those members are opportunist. Opportunistic behavior has its roots in the transaction cost literature, and is defined as self-interest seeking with guile [9]. In this study, opportunistic behavior was measured using scales

adapted from Morgan and Hunt [9]. Due to the higher risk of opportunistic behavior, participants have lower levels of trust in VC. Li et al. [8] provided evidence for enhance trust include improving the quality of communication with participants and minimizing any opportunistic behaviors. Trust was found to be significantly influenced by the communication between members and the opportunistic behavior of other members. Participants usually care about whether their partners keep their promises. In the VCs, lurkers are defined as VC members who visit and use the community, but not posting or posting very infrequently. Lurking is alike opportunistic behavior, will decrease their trust and relationship commitment.

We should treat VC members as our partners, more maintain members' connection and create commitment and trust. An additional interesting avenue of investigation might be to consider whether longitudinal studies provide for stronger inferences.

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Yu Ren Yen is an assistant professor of MIS at Far East University, Taiwan. His research areas are B2C relationships, information-technology innovation and diffusion, and E-commerce. His articles have apperaed in Journal of Information Management, Management Review, and WSEAS Trans on Information Science and Applications.

Appendix A. Loading and cross-loading matrix.

Scale	Item	RB	RTC	SV	CO	OP	RC	TRU	CI
RB	RB1	0.809	0.655	0.602	0.617	-0.250	0.536	0.568	0.509
	RB2	0.775	0.616	0.552	0.555	-0.267	0.535	0.540	0.532
	RB3	0.812	0.561	0.612	0.504	-0.218	0.491	0.521	0.426
	RB4	0.820	0.570	0.621	0.516	-0.208	0.515	0.528	0.461
	RB5	0.741	0.667	0.501	0.499	-0.223	0.625	0.593	0.459
RTC	RTC1	0.631	0.811	0.495	0.452	-0.239	0.501	0.636	0.418
	RTC2	0.611	0.794	0.516	0.529	-0.238	0.536	0.530	0.419
	RTC3	0.649	0.828	0.574	0.504	-0.294	0.548	0.625	0.506
	RTC4	0.639	0.803	0.554	0.539	-0.246	0.545	0.511	0.482
SV	SV1	0.626	0.541	0.817	0.528	-0.217	0.483	0.486	0.444
	SV2	0.616	0.581	0.855	0.554	-0.199	0.528	0.521	0.497
	SV3	0.594	0.545	0.858	0.516	-0.225	0.510	0.510	0.467
	SV4	0.579	0.529	0.786	0.461	-0.268	0.435	0.521	0.421
CO	CO1	0.565	0.518	0.533	0.811	-0.227	0.439	0.494	0.429
	CO2	0.591	0.547	0.486	0.826	-0.187	0.442	0.512	0.429
	CO3	0.565	0.535	0.550	0.821	-0.181	0.425	0.468	0.454
	CO4	0.433	0.379	0.401	0.719	-0.154	0.319	0.416	0.373
OP	OP1	-0.276	-0.291	-0.260	-0.218	0.911	-0.199	-0.354	-0.191
	OP2	-0.269	-0.272	-0.236	-0.204	0.888	-0.187	-0.320	-0.166
	OP3	-0.240	-0.276	-0.228	-0.208	0.862	-0.204	-0.281	-0.181
RC	RC1	0.514	0.511	0.426	0.385	-0.133	0.785	0.491	0.520
	RC2	0.555	0.492	0.445	0.377	-0.170	0.789	0.523	0.504
	RC3	0.611	0.562	0.534	0.447	-0.201	0.842	0.535	0.610
	RC4	0.517	0.510	0.438	0.394	-0.130	0.769	0.451	0.619
	RC5	0.480	0.484	0.396	0.437	-0.167	0.736	0.471	0.685
TRU	TRU1	0.612	0.613	0.530	0.525	-0.305	0.529	0.824	0.542
	TRU2	0.581	0.562	0.465	0.433	-0.248	0.521	0.785	0.455
	TRU3	0.573	0.563	0.492	0.508	-0.328	0.559	0.849	0.512
	TRU4	0.524	0.575	0.445	0.454	-0.298	0.471	0.822	0.481
CI	BI1	0.526	0.470	0.486	0.497	-0.183	0.675	0.538	0.873
	BI2	0.566	0.545	0.518	0.477	-0.195	0.655	0.596	0.893
	BI3	0.520	0.481	0.486	0.466	-0.109	0.623	0.532	0.871

RB=Relationship Benefits; RTC=Relationship Termination Costs;
SV=Shared Values; CO=Communication; OP=Opportunistic Behavior;
RC=Relationship Commitment; TRU=Trust;   CI=Continuance Intention.