Sense of Virtual Community: Conceptual Framework and Empirical Validation

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Abstract

In this article, we introduce the "sense of virtual community" construct and explore the factors that are expected to affect it. We also examine the moderating effect of the virtual community origin. By analyzing 172 responses, we found that the sense of virtual community is affected by the virtual community characteristics such as (1) leaders' enthusiasm, (2) perceived similarity, (3) off-line activities, and (4) playfulness. From the moderated regression analysis, we also found that the virtual community origin moderates the relationship between virtual community characteristics and sense of virtual community.

1. Introduction

As the internet coverage broadens rapidly, the *virtual community*, has become a topic of interest to IT professionals and management researchers [e.g., Jones, 2000]. Despite the explosive growth of virtual communities on the internet, limited empirical research has been conducted to study the issues related to the psychological states of the virtual community members.

The objective of this study is to enhance the existing knowledge about virtual community by introducing a new construct, sense of virtual community, and empirically validating the effects of virtual community characteristics on the sense of virtual community. We draw from the relevant literature and focus on developing a conceptual foundation for understanding virtual community. More specifically, this study intends to answer the following questions:

• What is the *sense of virtual community*? Is there any unique property differentiating it from that of a traditional community?

• What are the key factors affecting the sense of virtual community at the individual level?

• Does the origin of virtual community moderate the relationship between virtual community characteristics and sense of virtual community?

2. Sense of Virtual Community, and Virtual Community Origin

Computer-mediated community environments need commitment of their members just like the traditional environment, based on the fact that we understand *virtual community* to be "a community extended via emerging technologies." Among the four elements (membership, influence, integration, and emotional connection) that McMillan & Chavis [1986] regarded as the components of sense of community, *membership* and *influence* are considered as common perception factors in both the virtual and traditional communities. Reflecting the unique characteristics of the virtual space, we introduce a new dimension of *immersion*, using an expanded concept of *flow* [Csikszentimihalyi, 1975; Hoffman & Novak, 1996]. Thus, sense of virtual community is treated as having three dimensions: (1) *membership*–people experience feelings of belonging to their virtual community, (2) *influence*–people influence other members or their community, and (3) *immersion*–people feel the state of flow during virtual community navigation. We define *sense of virtual community* as the psychological state of perceiving three dimensions of membership, influence, and immersion, formed through the activities of virtual community.

With respect to the virtual community origin, virtual communities can be dichotomized as *online originated* and *offline originated*. We are interested in examining the moderating role of the virtual community origin on the proposed relationships between virtual community characteristics and sense of virtual community.

3. Research Model and Hypotheses

We concentrate our efforts on developing a conceptual foundation for understanding a virtual community, introducing *sense of virtual community*, its determinants, and the moderating variable. The model for this research is shown in Fig. 1.

Leaders' enthusiasm helps members feel that the virtual community is activated, and it also fosters them to pay attention to the virtual community [Kim, 2000]. Some practitioners even argue that, with only one passionate leader, a virtual community can be activated and its members get to participate actively in the community activities. Even though leadership necessary for virtual communities may differ from traditional leadership, *leaders' enthusiasm* is expected to influence community members to feel greater *membership* toward the community.

Hypothesis 1: There is a positive relationship between *leaders' enthusiasm* and *membership*.

Fig. 1. Research model
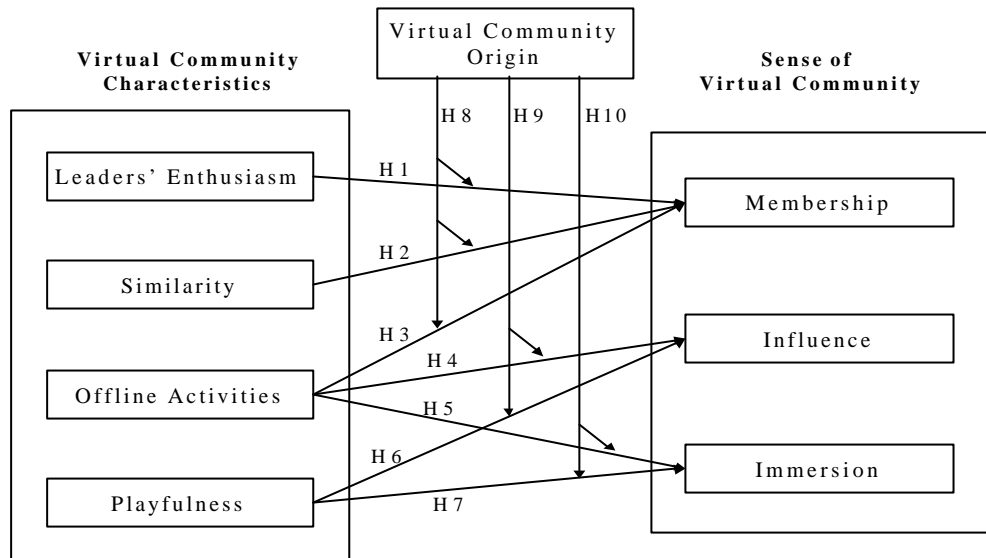
Exclusion of non-members is a characteristic of the virtual space as is in the real world, and is related to a concept of *perceived boundaries* in the real life [McMillan & Chavis, 1986]. In-group members are distinguished from out-group members through scarcity of resources. A group based on similar interests tends to exclude strangers, which keeps the community homogenous. We can take the closed user group (CUG) as an example. Since most of the virtual communities have been formed, based on similar interests and themes, *similarity perception* is important for reinforcing *membership* within a virtual community [Sarason, 1974].

Hypothesis 2: There is a positive relationship between *similarity* and *membership*.

O*ffline meetings* can play a role in complementing the low social presence inherent of most computer-mediated environments [Lombard & Ditton, 1997]. Kiesler et al. [1984] argued that balancing online with offline activities is critical in sustaining a virtual community, implying that use of diverse communication channels may be effective in the computer-mediated environment. While Walther [1995] argues that on-line interactions are as sociable and intimate as in-person interactions over time, we believe that off-line meetings will help facilitate the virtual community activism and lead to higher sense of virtual community.

Hypothesis 3: There is a positive relationship between *offline activities* and *membership*.

Hypothesis 4: There is a positive relationship between *offline activities* and *influence*.

Hypothesis 5: There is a positive relationship between *offline activities* and *immersion*.

We also propose that *playfulness* is a useful construct for understanding individuals' evaluation and

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affection of virtual communities. Previous research has revealed that attitudinal outcomes such as emotion, pleasure, and satisfaction result from the playfulness experience [Csikszentimihalyi, 1975]. *Playfulness* will affect *flow*–immersion by human-machine interaction [Griffiths, 1998]. Furthermore, *playfulness* lets members perceive *influence* on other members or on their community because it contains interactions among members or between members and their community. Consequently, when a virtual community provides entertainment value for its members in the online context, it would be more likely to be activated [Moon & Kim, 2001].

Hypothesis 6: There is a positive relationship between *playfulness* and *influence*.

Hypothesis 7: There is a positive relationship between *playfulness and immersion*.

As mentioned above, virtual communities are classified into two types. Online originated virtual communities are launched based on the common interests and themes communicated via computer-mediated communications. Weak ties are mostly observed in the initial stage [Wellman & Gulia, 1999]. For example, *membership* and *influence* are likely to be low in the early stage of the online originated virtual community. On the other hand, social relationship in an offline originated virtual community tends to be strong even at the beginning of the online-communication due to prior offline interactions [Blumstein & Kollock, 1988]. Therefore, higher levels of leaders' efforts and offline activities are necessary for increasing *membership* and *influence* in the case of *online originated* virtual communities than in the case of offline originated virtual communities. Besides, online originated virtual communities are probably relatively homogenous in their interests and attitudes while being heterogeneous in terms of the participants' age, gender, social class, ethnicity, and other aspects of their demography [Wellman & Gulia, 1999]. The homogenous interests of online originated virtual community members may foster a relatively high level of empathetic understanding and mutual support [Marsden, 1983]. Hence, *perceived similarity* with the interests and values will affect *membership* more strongly in the case of the *online originated* virtual community than in the case of the offline originated virtual community. Additionally, *immersion* is generated by the online oriented communications [Young, 1996] that the online originated virtual community depends on. It is unlikely that the offline originated virtual community will incur high level of *immersion* of members because it mainly depends on the cognitive mechanisms already formed by the prior face-to-face communication. Thus, affecting factors seem to influence *immersion* more strongly in the case of the *online originated* virtual community than in the case of the offline originated virtual community.

On the basis of the above discussion, we derived the following hypotheses to validate the moderating effect of the virtual community origin on the basic relationships between virtual community characteristics and sense of virtual community.

Hypothesis 8: The *virtual community origin* moderates the relationship between *virtual community characteristics* and *membership*.

Hypothesis 9: The *virtual community origin* moderates the relationship between *virtual community characteristics* and *influence*.

Hypothesis 10: The *virtual community origin* moderates the relationship between *virtual community characteristics* and *immersion*.

4. Methods and Results

We developed the instruments for our variables based on the relevant literature and the results of the prior interviews with the system operators (sysops) of the four representative virtual communities in Korea. With the questionnaire modified through the pre-testing, we selected 44 virtual communities that have been recognized as the popular virtual community sites in Korea and distributed 220 questionnaires, assigning 5 questionnaires to each community. From the 220 questionnaires that were distributed, 172 usable[1] questionnaires were received and used for analysis. The response rate was 78 percent. In terms of gender and age of the respondents, 47 percent of them were male, and 71 percent were less than 26 years old. In addition, 92 respondents were enrolled in the *on-line originated* virtual community, and 80 individuals were members of the *off-line originated* virtual communities.

We conducted the factor analysis, the reliability test, the multiple regression analyses, the moderated regression analyses [Atuahene-Gima & Li, 2000] and others. First, all instruments demonstrated high convergent and discriminant validity and their Cronbach's alpha values were all satisfactory, ranged from 0.742 to 0.930. Conducting the multiple regression analyses, virtual community characteristics affecting the sense of virtual community were detected at the individual level (See Table 1). *Membership* was significantly affected by (1) *leaders' enthusiasm*, (2) *perceived similarity*, and (3) *offline activities*. *Offline activities* had the strongest impact on *membership* and *influence* in the virtual community. It is consistent with the results of the prior studies that strong ties cannot be sustained without physical cues [e.g., Beniger, 1987]. However, the variable of *offline activities* does not seem to be a significant factor affecting *immersion*. We interpret this to mean that *offline activities* incur two effects: one is fostering members to commit to the community and the other is preventing them from becoming fully immersed in the community online activity. We presume that the two contradicting effects of *offline activities* on *immersion* might cancel each other and suggest that further research will be necessary for developing a relevant contingency theory. *Immersion* was influenced only by *playfulness*, while *perceived influence* was significantly affected by *offline activities* and *playfulness*. The result implies that a virtual community should find and meet the needs of its members, supporting Kim's [2000] observations that successful communities evolve to keep pace with the changing needs of their members. It also suggests that virtual communities should encourage their members to meet each other in the offline setting, so that their members may perceive high *influence*.

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[1] Six irrelevant questionnaires returned were discarded

Table 1: Results of hypotheses tests (From H1 to H7)

Model	R^2	F	β	Results
(1) Membership (MEM)				
MEM = E + S + O + errors	0.592	80.753***		
E			0.219***	H1 was supported.
S			0.255***	H2 was supported.
O			0.475***	H3 was supported.
(2) Influence (INF)				
INF = O + P + errors	0.478	77.307***		
O			0.631***	H4 was supported.
P			0.129**	H6 was supported.
(3) Immersion (IMM)				
IMM = O + P + errors	0.159	15.802***		
O			- 0.007	H5 was rejected.
P			0.402***	H7 was supported.

**p<0.05; ***p<0.01

(Note) E, Leaders' enthusiasm; S, Similarity; O, Offline activities; P, Playfulness.

Another important finding of this study is that the impacts of virtual community characteristics on the sense of virtual community are *contingent* on the *virtual community origin* (See Table 2 for models of moderated regression analyses and Table 3 for results of it). Both *leaders' enthusiasm* and *similarity* affected *membership* more strongly in the case of an online originated virtual community than in the case of an offline originated one (Hypothesis 8 is supported). Also, *offline activities* affected *influence* more strongly in the online originated virtual community than in the offline originated one, which supports Hypothesis 9. The results imply that in the case of an online originated virtual community, practitioners should concentrate more on empowering active leaders, enhancing perceived similarity with other members, fostering interactions between members and holding various events in an offline setting. However, in another moderated regression analysis in terms of *immersion*, no significant increased R^2 was found (Hypothesis 10 is not supported).

Table 2: Models for moderated regression analyses

Models for moderated regression analyses	Related Hypothesis
Model 1: MEM = E + S + O + CO + E × CO + S × CO + O × CO + errors	Hypothesis 8
Model 2: INF = O + P + CO + O × CO + P × CO + errors	Hypothesis 9
Model 3: IMM = O + P + CO + O × CO + P × CO + errors	Hypothesis 10

(Note) MEM, Membership; INF, Influence; IMM, Immersion; E, Leaders' enthusiasm; S, Similarity; O, Offline activities; P, Playfulness; CO, Community Origin.

Table 3: Results of moderated regression analyses: Moderating effects of the community origin (CO) on sense of virtual community

	Standardized Regression coefficient (β)		
	Membership (Model 1)	Influence (Model 2)	Immersion (Model 3)
Independent variables			
Enthusiasm	0.279***	N/A	N/A
Similarity	0.347***	N/A	N/A
Offline activities	0.503***	0.838***	0.142
Playfulness	N/A	0.166**	0.344***
Moderator variables			
Community Origin (CO)	0.786***	0.387	- 0.442
R^2	0.600	0.480	0.248
Interaction effects			
CO × Enthusiasm	- 0.323*	N/A	N/A
CO × Similarity	- 0.368*	N/A	N/A
CO × Offline activities	- 0.121	- 0.510***	- 0.123
CO × Playfulness	N/A	- 0.076	0.230
Incremental R^2	0.034	0.041	0.003
F Change	5.097	7.121	0.289
Significance of F change	0.002	0.001	0.749
Full Model			
R^2	0.634	0.521	0.251
Adjusted R^2	0.618	0.507	0.228
F-value	40.372***	36.139***	10.968***
d/f	7/163	5/166	5/164

*$p<0.1$; ** $p<0.05$; ***$p<0.01$

5. Conclusions

In this study, we proposed and validated that the *sense of virtual community* construct is composed of three dimensions: *membership*, *influence*, and *immersion*. Besides, we found that the sense of virtual community is affected by (1) *leaders' enthusiasm*, (2) *perceived similarity*, (3) *offline activities*, and (4) *playfulness*. We also validated that the effect of virtual community characteristics (leaders' effort, similarity, offline activities and playfulness) on sense of virtual community is contingent on the virtual community origin.

For the researchers on virtual community, we suggest to explore objective and behavior-oriented outcome variables such as frequency of visit, duration time, or organizational citizenship behaviors for

future research. We suspect that the sense of virtual community may mediate the links between independent variables and such outcome behaviors. To be able to trace such link over time, a longitudinal study may need to be conducted that observes the same set of virtual communities over time.

Since the data was collected only in Korea and the target communities were chosen with a convenient sampling method, the general applicability of the findings is limited. Nevertheless, we believe that establishing the *sense of virtual community* construct provides a valuable perspective for in-depth understanding of virtual community and its members' behaviors.

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