

# A Review of Frameworks for Online Community Design

with Emphasis on Developing Online Community Construct

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**Abstract:** This study reviewed researches from psychology, management engineering, sociology and practical reports to understand the characteristics and dynamics of online community that lie over many domains. This study identified and visualized the hierarchical structure of online community attributes and suggests online community construct as a result.

As the notion of community is originated from geographical groups, and with the belief that geographical community shares identical characteristics with online community, this study reviewed researches about geographical community as a start-point. Then the study approached through three main perspectives (1) online community attributes, (2) sense of online community and (3) challenges of online community. The challenges in online community that are hard to be controlled by designers (communication, motivation, leadership, and technology) are considered as external factors.

With socio-technical perspective, this study defined member, interaction, shared goal and relationship as main attributes of online community. Based on the reviews on sense of place and sense of community, the sense of online community is defined as compound attributes of membership, needs fulfillment, influence and emotional connection. The integration of online community attributes with sense of online community induced extending the definition of online community attributes.

This study proposes an online community construct that encompasses the previously reviewed frameworks. Also this study found that online community construct includes other dimensions such as cognitive, affective, behavioral and challenging perspectives.

**Key words:** *Online, Geographical Community, Online Community, Online Community Construct*

## **1. Introduction**

Thanks to readily available Internet access in Korea, online communities in Korea are now flourishing with unprecedented rate over her fertile IT infrastructure. Now members of online community can exchange information horizontally and asynchronously across themselves. Some researchers note that online communities document every life in cyberspace (Larsen and McInerney, 2002), and exchanging information and knowledge inside them rapidly and dramatically changes our lives (Sproull and Kiesler, 1993). Also E-commerce entrepreneurs anticipate that online communities will play an important role in marketing (Koh, 2003). The growth of online community in recent years implies that understanding online community has been an important issue for diverse domains.

### **1.1 Research Background**

As the online community itself lies over many domains, various academic and practical backgrounds such as IT professionals, industrial engineers, management engineers, sociologists, psychologists, and designers studied online community to establish or run a successful online community. Professional designers work for community design projects in the real business fields. However, from design perspective, it is unclear about what the designers can do for the online community design.

### **1.2. Research Objectives and Questions**

This study's purpose is to understand online community characteristics and dynamics, to examine the potentials of online community's design opportunities, and to provide the requirements for professional designers. Understanding psychological states and behaviors of online community members and comprehending online community dynamics can help providing professional designers with more specific ways of viewing online communities and finally lead to realize potentials of design roles in online community.

This study has following key questions:

- (1) What are the key factors comprising online community?
- (2) What is the hierarchical and vertical structure of the key factors?

### **1.3 Research Scope and Organization of the Study**

This study is composed of three parts: (1) review on related studies, (2) developing theoretical framework and construct, (3) overall discussions and implications.

## **2. Reviews on Related Studies**

In the social, practical, and philosophical fields, researches are undergoing investigation to explain the characteristics of community. These researches suggest diverse theoretical constructs that helps set up the start-point to understand 'online' communities.

Gusfield (1975) distinguished between two kinds of communities: the one is the traditional territorial or geographic community. In this sense, community refers to a neighborhood, town, or region, thus sense of community implies the sense of belongingness to a specific spatial setting (Obst, 2002). The other is a relational community, concerned with human relationship without reference to location. These two types of community are not necessarily mutually exclusive. Most of the communities thriving in the Internet fall under the definition of

relational community since their members are not physically bound together (Wellman and Guila, 1999).

In this study, the term ‘geographical community’ indicates physical, non-virtual community and the term ‘relational community’ indicates a virtual, computer-mediated networking community. Because the notion of community is originated from geographical group, and as online community inherits the fundamental characteristics from geographical community, this study reviewed researches about geographical community as a start-point.

## 2.1 From Geographical Community and Sense of Place

There are several of definitions about geographical community. Heller (1989) noted that a community is mainly characterized by the relational interaction or the social ties that draw people together. A community can also be seen as a group where individuals come together based on an obligation to one another or as a group where individuals come together for a shared purpose (Rothaermel and Sugiyama 2001). Duncan (1959) regarded the community as an ecological complex based on the interdependence of four components: people, organization, environment, and technology. These definitions suggest the following common keywords: member, interaction, relationship and shared purpose.

A member’s notion of the strength of belongingness to a community is called “sense of community.” Heller (1984) defined the sense of community as “the feeling of the relationship an individual holds for his or her community.” Newbrough and Chavis (1986) also pointed about the sense of community as the personal knowledge that one has about belonging to a collective of others. Others view it as “the perception of similarity to others and an acknowledged interdependence with others” (Sarason, 1974).

While several other researchers have also conceptualized the sense of community construct (Nasar and Julian, 1995; Buckner, 1988; Davidson and Cotter, 1986; Glynn, 1981), there still seems to be little consensus on the psychological dimensions that underlie the sense of community construct. A recent sense of community seminar at the 1997 SCRA (Society for Community Research and Action) resulted in a lively debate as to how we can understand sense of community from a psychological perspective. They noted “participants considered whether sense of community is best conceptualized as cognition, a behavior, an individual affective state, an environmental characteristic, or a spiritual dimension. No consensus was reached” (Chipuer and Pretty, 1999).

McMillan and Chavis (1986) conducted an in-depth review of the literature and developed a set of scales to measure dimensions of the sense of community. According to them, the sense of community is composed of four elements: membership, influence, needs fulfillment, and emotional connection.

- *Membership* indicates that people experience feelings of belonging to their community.
- *Influence* implies that people feel they can make a difference in their community.
- *Needs fulfillment* suggests that members of a community believe that their needs will be met by the resources available in their community.
- *Emotional connection* is the belief that community members have and will share history, time, place, and experience.

The four common key attributes of community and the four elements of sense of community intersect as shown in Table.1. Figure.1 explains the hierarchical structure of community coupled with sense of community. The structure is comprised of five positive layers including community layer. While members interact with each other, the emotional connection is established. The emotional connection initiates the relationship that can evolve

into a convoluted interdependent relationship among large number of members. Cumulated relationship can lead to influential power and then advances to membership layer. ‘Shared goal’ layer that is the core of community existence also gives the membership.

Table.1 Attributes from community and the relationship with McMillan and Chavis’ definition about the sense of community

Attributes of Community	Sense of Community	Note for Sense of Community
Members	Membership	Member’ relationship and belongingness
Interaction	Influence	Result of relational interaction
Shared goal	Needs fulfillment	Raison De’tre of community
Relationship	Emotional connection	Result of interaction

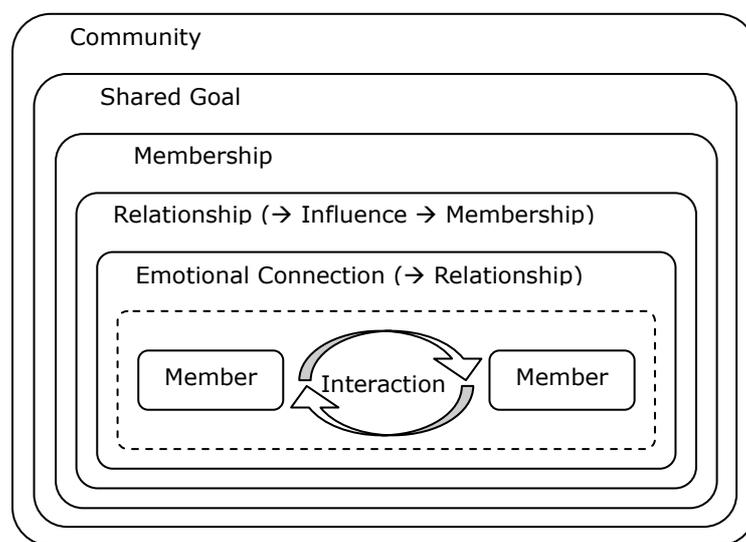


Fig.1 Hierarchical Composition of Community and Sense of Community

The emotional connection is defined as a belief of the bind between members. This definition overlaps with the definition of membership. However, the emotional connection is treated distinctively with the membership because emotional connection reflects more on affective perspective while membership reflects more on cognitive perspective. This study follows McMillan and Chavis’ definition of the sense of community as it agrees with the aforementioned four common keywords extracted from various definitions of community.

Since interactions among community members mostly take place at a specific place in geographic location, this study looks into the concept “sense of place” (Hummon, 1992; Shamai, 1992) from the environmental psychology and rural sociology.

Jorgensen and Stedman (2001) defined the sense of place as a multidimensional construct comprising (1) place identity: beliefs about the relationship between self and place, (2) place attachment: feelings toward the place (3) place dependence: the behavioral exclusivity of the place in relation to alternative.

*Place identity* involves "those dimensions of self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioral tendencies and skills relevant to this environment" (Proshansky, 1978, p.155). It is considered as a cognitive structure (Proshansky, 1983; Jorgensen and Stedman, 2001). *Place attachment* is described as a positive bond that develops between groups or individuals and their

environment (Williams et al., 1992), containing emotional contents (Jorgensen and Stedman, 2001). *Place dependence* is defined as "an occupant's perceived strength of association between himself or herself and specific places" (Stokols and Shumarker, 1981, p.457). Hummon (1992) argued that sense of place involves both a cognitive perspective on the environment and an emotional reaction to the environment, implying a multidimensional construct. Table.2 shows the summarization of sense of place.

Table.2 Summarization of sense of place

Place Construct	Description	Dimension
Place Identity	Personal identity in relation to the physical environment	Cognitive
Place Attachment	Positive bond with member/environment containing emotional contents	Affective
Place Dependence	Perceived strength between person and specific place	Behavioral

Canter (1991), places represent a confluence of cognitions, emotions and actions organized around human agency. In this respect, Canter recognized that places could be conceptualized as an integrated system comprising three attitude domains: a tripartite framework comprising cognitive, affective and behavioral processes. The composition is drawn in Table.3. This construct give a basement perspective for reviewing the online community researches.

Table.3 Dimension, sense of place, community attributes, and sense of community

Dimension	Sense of Place	Community Attribute	Sense of Community
Cognitive	Place identification	Members	Membership
		Shared goal	Needs fulfillment
		Interaction	Influence
Affective	Place attachment	Relationship	Emotional connection
Behavioral	Place dependence	N/A	N/A

Legend: N/A=Not Applicable

## 2.2 Online Community over Geographical Community

Any members have been able to disseminate information electronically without hierarchical channels in online community (Larsen and McInerney, 2002). E-commerce entrepreneurs take a very broad view of community. Any chatting system, bulletin board or communication software program can be regarded as an online community (Preece, 2000).

However, there are two staple view points about online community (Table.4): social perspective and socio-technical perspective. Social perspective focuses on sociability. Socio-technology perspective focuses on both sociability and usability, and their fit (Whitaker and Parker, 2000; Godwin, 1994; Yoo, 2000; Preece, 2000).

The followings are definitions of online community by various researchers.

- Fernback and Thompson (1995) defined a virtual community as "social relationships forged in cyberspace through repeated contacts within specific boundary or place."
- Balasubramanian and Mahajan (2001) defined it as any entity that exhibits all of the following characteristics: (1) an aggregation of people, (2) rational members, (3) interaction in cyberspace without physical collocation, (4) social exchange process, (5) a shared objective, property / identity or interest between members.
- From relationship building perspective, Rheingold (1993) defined the virtual community 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 relationship in cyberspace." This definition points out the following keywords: (1) social aggregation of members, (2) network communication, (3) discussion on a long-time span, (4) emotions, (5) relationship.

- Rothaermel and Sugiyama (2001) argued that online communities are not only about aggregating information or resources, but also bringing people together to meet some of their commercial need as well as social needs. This suggests: (1) aggregation of information or resources, (2) members, (3) social & commercial needs.
- Hagel and Armstrong (1997) also defined the virtual community as "the computer mediated space where there is an integration of content and communication with an emphasis on the member-generated content." This definition gives the following keywords: (1) computer mediated space (cyberspace), (2) integration of content and communication, (3) member-generated contents.
- Bieber (2002) noted that computer-mediated communication structures and tools allow virtual communities to work together online, not only communicating about specific themes by web posting and viewing activities, but also building collaborative knowledge base.
- Koh (2003) defined the online community as "a group of people with common interest or goal, interacting predominantly in cyberspace." He suggests (1) group of people, (2) common interest or goal, (3) interaction, (4) cyberspace.

Table.4 Two Staple Perspectives for Online Community

Perspectives	Focuses	Related Studies
Social perspective	Such as leadership, off-line activities, persistent identity, rules/roles, or clear visions	Kim, 2000; William and Cothrel, 2000; Kollock, 1998
Socio-technical perspective	Both sociability and usability (the humane quality of system), and even their fitness	Whitaker and Parker, 2000; Godwin, 1994; Yoo, 2000; Preece, 2000

There are criteria such as time span, and communication in the table. These criteria can be removed or merged into other criterion. Table.5 and Table.6 explains summarization and the adjustment of criteria.

Table.5 Summarization of Definitions of Online Community with Adjusted Criteria

Criteria	Fernback, Thompson	Balasubramai na, Mahajan	Rheingold	Rothaemel, Sugiyama	Hagel, Armstrong	Bieber	Koh
Cyberspace	O	O	O	O	O	O	O
Members	O	O	O	O	O	O	O
Interaction	O	O	O		O	O	O
Shared goal	O			O	O	O	O
Relationship	O		O				
Information / contents				O	O	O	

Legend: O=Selected

Next, researchers introduced a new dimension, immersive behavior, using extended concept of flow (Csikszentimihalyi, 1975; Hoffman and Novak, 1996; Novak, 2000). Online community characteristics such as anonymity, addictive behaviors and voluntary behaviors imply the state of immersion, or flow experience as Csikszentimihalyi (1975) notes.

Table.6 Criteria adjustment

Criterion	Description	Adjustment
Cyberspace	Computer mediated network facility where communication and interaction between people / software can take place. This is major premise of the concept of 'online'.	Treated as an inherent characteristic of 'online'.
Time span	Time span indicates the chronological requirement to form an aggregation of people and contents. This criterion is an inherent requirement attribute affecting all the other criteria.	Removed
Communication	Communication means interaction between members via network facility (cyberspace).	Covered by interaction, cyberspace
Emotion	Emotion, a shared experience or belief between members, is a result of relational interaction.	Covered by relation, interaction
Social / commercial needs	Needs is a preemptive or antecedent attribute. This attribute is also a <i>raison de'tre</i> of community. Needs can be seen as an individual goal.	Covered by shared goal.
Collaboration	The notion of working together is reflected by interaction.	Covered by interaction
Information / contents	Information is a sharable object for individual or group. Information is generated and consumed under shared goal or needs.	Covered by shared goal.

Csikszentimihalyi (1975) argued that flow is the term used to describe the "holistic sensation that people feel when they act with total involvement." Researchers have used the concept of the optimal experience to study a diverse set of activities from rock-climbing and ocean-cruising to meditation and ordinary work (Csikszentimihalyi and Csikszentimihalyi, 1988). Hoffman and Novak (1996) defined the flow experience in the computer-mediated environment as "the state that occurs during network navigation." According to them, it includes the following four dimensions: (1) a seamless sequence of responses facilitated by machine interactivity, (2) intrinsic enjoyment, (3) loss of self-consciousness, and (4) self-reinforcing. Consequently, flow seems to be characterized by enjoyment and caused by human-machine interactions (Griffiths, 1998).

Table.7 Dimension, Sense of Place, Community Attributes, Sense of Community, and Online Community

Dimension	Community Attribute	Sense of Place	Sense of Community	Online Community
Cognitive	Members	Place identification	Membership	Members
	Shared goal		Needs fulfillment	Shared goal Information / contents
	Interaction		Influence	Interaction
Affective	Relationship	Place attachment	Emotional connection	Relationship
Behavioral	N/A	Place dependence	N/A	Immersive Behavior
Others				Cyberspace

Table.7 shows the complex of dimension, sense of place, community attributes, sense of community, and online community. The concept of flow is expected to be relevant in the online community context because many online community members, unlike the traditional community members, display totally immersive (or addicted) behaviors toward their community. This study regards immersive behavior as a behavioral surrogate to reflect the online community member's psychological state of flow, comprising the behavioral dimension of the sense of online community construct.

### 2.3 External Challenges in Online Community

Online communities link community members across time, space, and organizational boundaries with the efficiency of the new types of communication technologies. As Bieber (2002) notes, computer-mediated communication structures and tools allow online communities to work together online, not only communicating about specific themes by web posting and viewing activities, but also building collaborative knowledge base. Hiltz and Turoff (1985) described a number of computer-mediated communication structures and procedures “beyond the email system,” which help members create, organize, and retrieve information (or knowledge).

Although online communities face challenges that are similar to traditional geographical communities, they may face several unique problems which are not found in face-to-face communications (Kayworth and Leidner, 2002). Table.8 summarizes the types of challenges faced by online communities.

Table.8 Summary of External Challenge Factors of Online Community

Type of Challenge	Description	Related Theories
Communications	<ul style="list-style-type: none"> <li>● Communication dynamics to be changed</li> <li>● Low social presence</li> <li>● Inhibition in building trust</li> </ul>	CMC (Computer-mediated communication) theory Social presence theory
Motivation	<ul style="list-style-type: none"> <li>● Diversity of benefits which the community members believe they may gain from membership</li> </ul>	Intrinsic/extrinsic motivation theory
Leadership	<ul style="list-style-type: none"> <li>● Ensuring adequate levels of community activities and membership growth</li> </ul>	Leadership theory Team effectiveness
Technology	<ul style="list-style-type: none"> <li>● High cost for connection to the Internet</li> <li>● Low quality and low speed lines for Internet connections</li> <li>● Skills for a wide range of computer technologies</li> </ul>	CMC theory User computer self-efficacy

First, social presence theory addresses how successfully media convey a sense of the participants being physically present (Short, 1976). Social presence depends not only on the words people speak but also on verbal and nonverbal cues, body language, and context (Rice, 1993). Since communication media may differ in their ability to convey “social presence,” communication dynamics may be limited or distorted in online environments that the lack of social presence (Kiesler and Sproull, 1992).

From the perspective of motivation, the members whose needs are met by community resources (such as useful contents) are likely to develop strong loyalty toward their online community. Such members would participate in the community activities more actively than in traditional geographical community due to ease of access, speed of communication, asynchronism, and security of anonymity offered in the online space. The challenge here is to satisfy the diverse needs of the online community members who are much more heterogeneous than members of the traditional, off-line communities such as neighborhood or fellow students

Since there are variables in online settings (Solomon, 1995), certain leadership roles may be particularly important in the online community environment. Given the changed social context, community leaders, who either have founded the community or are in the charge of its current operations and future growth, may develop a social climate inside the community necessary for ensuring adequate levels of community activities. Also they should act in mentoring role with a high degree of empathy toward other members (Kayworth and Leidner, 2002), and have to clarify the vision for their communities, and coordinate the appropriate mode of communications among their members.

Lastly, every online community faces a technology challenge. Online community's heavy dependence on computer and communication technologies exposes it to frequent failure and performance degradation of its information system infrastructure (Kayworth and Leidner, 2002). Diverse technologies and user skills on the client (member) side only aggravate such challenge (Preece, 2000).

Given these challenges in communication, motivation, leadership and technology, coupled with lack of empirical experience, understanding the online community environment may be more complicated than understanding the geographical community environment.

### 3. Results and Discussions

This study reached three main perspectives (1) online community attributes, (2) sense of online community and (3) challenges of online community. The four challenge factors (communication, motivation, leadership, and technology) are considered as external factors.

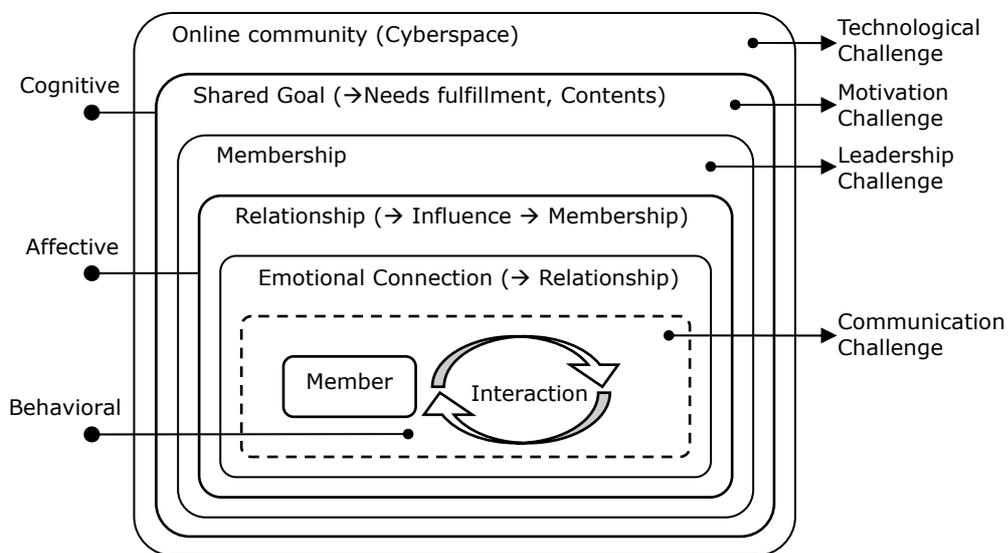


Fig.2 Online community construct

The online community can be seen as a congregation of members from two sources. The one is from the 'Shared Goal' that meets the personal needs. Given the shared goal, members gather into the community without personal relationship and have more chances to feel the sense of belongingness to the needs fulfillment or utility. This befitting tendency leads to strengthening of membership. Under similar interest, members exchange information impassively with other members, thus personal relationship can be grown slowly. This route can coerce an online community into 'membership-oriented' one. Public online forums fall under this classification.

The other source is from the emotional connections that are initiated by personal communications. With casual contacts, the network of emotional connection can evolve into congregation of people under faint boundary. Although there is no (or weak) shared goal, members are strongly bound to other members. If an online community shows this type of disposition, it can be called 'relationship-oriented' one. Members can find or establish a shared goal among their communication activity. However, because there is no central propagation channel, the shared goal may spread slowly or be ignored by others. Personal web log (blog) can be classified as an instance of relationship-oriented community.

As shown in Figure.2, online community can be seen as a mixture of many attributes that is imperatively bolstered up on membership and relationship. In other words, membership and relationship can be considered as

essential factors for maintaining and amassing community members.

#### **4. Conclusion and Further Studies**

The online community lies over many domains. In this study, to understand the characteristics and dynamics of online community, researches from psychology, management engineering, sociology and practical reports were reviewed. This study visualized the hierarchical structure of online community attributes: shared goal, membership, relationship, emotional connection, interaction and member. Also the construct includes other dimensions such as cognitive, affective, behavioral and challenging perspectives.

This study suggests the following further issues:

- (1) The challenge factors were dealt as external factors. Though we can perceive the online community with the online community construct, more in-depth research about understanding and overcoming challenge factors is required.
- (2) The online community construct needs to be verified over diverse cultural environment.
- (3) The online community construct can be readjusted with the 'shared goal' level because it is regarded as the most influential factor of online community.

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