A STUDY OF ACTIVE AND PASSIVE USER PARTICIPATION IN VIRTUAL COMMUNITIES

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ABSTRACT

This study examines the individual and social factors influencing the participation intention of viewers and posters in virtual communities. Trust, reward, structural capital, and cognitive capital play significant roles for both types of user. Reputation and reciprocity have a positive impact only on posters' participation intention, while viewers are also affected by enjoyment. The only social factor having no effect on posters' participation intention is identification. Viewing behavior is not correlated with reciprocity and identification. The positive relationship between reward and participation intention is stronger for posters than for viewers. In addition, managerial implications and suggestions for future research are discussed.

Keywords: Virtual communities; Social capital; User participation; Viewers and posters; Electronic word of mouth (eWOM)

1. Introduction

Virtual communities (VCs) were first defined as "social aggregations that emerge from the Net when enough people carry on public discussion long enough, with sufficient human feeling, to form webs of personal relationships in cyber-space" [Rheingold 1993]. The key development with respect to the VC is the great increase of user-generated content on the Web, and the ability to easily search through it and combine parts of it to form new content. VCs enable users to communicate and connect with each other, and to build up a personal network with common interests, allowing them to interact regularly in an organized way over the Internet. The VC is also the core element of social commerce [Liang et al. 2011-12], defined as a new form of electronic commerce that involves using social media to assist in the online buying and selling of products and services [Shen and Eder 2011]. The availability of user-generated content as the next "Intel Inside" is one of the characteristics of Web 2.0 [O'Reilly 2009]; therefore, encouraging users to provide content becomes an important issue for a given VC to attract more users and sustain its competiveness [Williams and Cothrel 2000]. If providing content may be termed a posting activity, another activity of viewing, along with the posting activity, is made up of the fundamental elements in the ongoing life of any VC [Koh et al. 2007]. Viewing or lurking has not received much attention and few studies on these activities are to be found in a review of the literature, since most research tends to focus on active participants, that is, on those who post online.

A *lurker*[1] is defined as a member of a VC who visits and uses the community but does not post messages [Ridings et al. 2006]. Lurkers are labeled as "free-riders" who drain the social capital of the community because lurking essentially means taking without giving back [Kollock amd Smith 1996]. In contrast, another study presented lurking in a more positive light [Nonnecke et al. 2006]. They discovered that many lurkers considered themselves as community members, and were possessed of the characteristics that community members attribute to a successful online community [Preece[b] et al. 2004]. Furthermore, community members hold more favorable views of lurkers and lurking than is often assumed. Although lurkers usually enjoy content on websites provided by others and do not actively participate in online communities, they account for the majority of users in many communities [Preece[a] et al. 2004]. For online community sponsors and operators, lurkers are important because they are part of the traffic, contributing to volume on servers, and responding to advertising and selling. It is important to understand how posters and viewers behave differently, so that online service operators can devise strategies targeting their users more effectively.

[1] For the purposes of this study, the terms viewer, lurker, and passive user have the same meaning while poster is equivalent to active user.

Most of the prior studies regarding the participation of VCs collected data from nonprofit online services [Bagozzi and Dholakia 2006; Bock and Kim 2002; Kankanhalli et al. 2005; Wasko and Faraj 2005] or from the VCs established not for profit [Chiu et al. 2006]. A study of knowledge sharing focusing on non-profit virtual communities suggested to investigate profit communities [Koh and Kim 2004]. In a survey regarding online users' behaviors, users of free e-service and of paid e-service were investigated. The results showed that they behaved differently [Chea and Luo 2008]. Another survey also reported that member participations in non-profit and profit-oriented communities were affected by different factors. Based on optimal arousal theories [Berlyne 1960], different service settings such as nonprofit VCs and commercial VCs may require different levels of arousal to be satisfied because users have various expectations toward the services offered [Wirtz et al. 2000].

VCs established for commercial purposes were rarely studied and their users might behave differently. This study used a commercial website named FunP as its data source. It is a well-known Web 2.0 service established in 2007 with most of its users from Taiwan, and is dedicated to sharing opinions on various topics such as politics, economics, culture, sports, entertainment, society, and so on. It collects revenues from advertisements posted on its sites and users can post and/or view articles that are organized according to their shared topics. For a given topic, an online discussion board is designed allowing users, either posters or viewers, to interact online. Since online advertisements are based primarily on traffic flow [Enders et al. 2008], encouraging the participation of users is a very important issue for this site's operations. Understanding what the factors are and how they influence the users' behavior on virtual communities with commercial purposes would contribute greatly to practices.

In addition to the practical contributions, this study also contributes to virtual community literature categorized in several ways. First, different factors affecting the participation intentions between viewers and posters are compared and identified. Second, the moderating role of user type on the intention to participate is tested and the findings suggest several recommendations to practitioners of web services. Last, by better understanding the dynamics of viewing and posting via this research, online community managers and e-commerce entrepreneurs will be able to build healthy and self-sustaining virtual communities.

2. Theoretical Background and Hypotheses

Viewing and posting are two types of behavior in that viewers are not even considered to be members of the communities and efforts should be undertaken to prevent lurking [Kollock and Smith 1996]. From this point of view, most users are lurkers before they begin posting; consequently, lurkers are potential posters [Ridings et al. 2006]. In a study of online user behavior [Nonnecke et al. 2006], 25% of lurkers selected "telling stories or participating in conversations" as the major reason for joining a community while 13% of lurkers wanted to offer their expertise. In addition, several researchers engaged in studying how a sense of community (SoC) affects user participation in virtual communities considered users as a whole [Casalo et al. 2008; Porter and Donthu 2008]. SoC reflects the feelings of attachment and belonging that an individual has towards a community. Through qualitative as well as quantitative research carried out across the lifespan of four communities, SoC was used as a framework for investigating ways in which social capital could be realized in communities [Pooley and Cohen 2005]. The results highlight the practical application of increasing a sense of community within communities through targeting SoC within individuals. Another study revealed how viewers differ from posters. A significantly higher proportion of posters join an online community that requires outreach into the community by the participant and/or interaction with other members [Nonnecke et al. 2006]. These relationships among individuals and within their communities are the source of social capital [Putman 1993]. In addition, many researchers studying participation in virtual communities do not distinguish between viewers and posters [Yoo et al. 2002; Dholakia et al. 2004; Kankanhalli et al. 2005; Cho et al. 2007].

Most of the studies for online posting and viewing did not specify what type of knowledge was to be shared, and focusing on product information shared online was commonly recognized as electronic word of mouth (eWOM), defined as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet" [Hennig-Thurau et al 2004]. eWOM occurs on a wide range of online channels such as VCs [Chu and Kim 2011], and it has been reported as a successful strategy to promote smartphones [Cavoli 2010]. Several studies have focused on the motivations for viewing or posting behavior such as eWOM. The results of an online sample of more than 2,000 respondents collected from several German web-based opinion platforms suggested that posting eWOM is affected by such factors as consumers' desire for social interaction, desire for economic incentives, concern for other consumers, and the potential to enhance their own self-worth [Hennig-Thurau et al 2004]. Another study used the Amazon user review dataset to identify opinion leaders and examine their eWOM effects on product sales [Bao and Chang 2014]. Three types of opinion leaders, similar to posters in this study, were identified as communicative (those who write a large number of reviews), buzz-generating (those whose online reviews generate contagious talk

about a product), and trustworthy (those whose online reviews are useful to fellow consumers). Its results showed that sales of products are influenced by product awareness expressed in eWOM, customer satisfaction expressed in eWOM, horizontal product differentiation shown in the eWOM of posters, polymorphic characteristics (knowledge in a variety of product categories) of posters, and monomorphic characteristics (experts in a limited number of product categories) of posters [Merton 1968]. Depending on the type of posters, the factors influence product sales in different degrees. While disseminating eWOM was studied by researchers, how users receive the eWOM, similar to reviewing behavior in this study, is also an important issue. By factor analysis, motivations for reading eWOM were categorized into several factors: obtaining buying-related information, social orientation through information, community membership, remuneration, and learning to consume a product [Hennig-Thurau & Walsh 2003]. In general, online posting and viewing behaviors for eWOM are affected by social factors such as tie strength, homophily, trust, interpersonal influence [Chu and Kim 2011], social benefits [Hennig-Thurau et al. 2004], social orientation, community membership, remuneration [Hennig-Thurau & Walsh 2003], and social capital [Hung and Li 2007] as well as by individual factors such as platform assistance, venting negative feelings, concern for others, self-enhancement, economic incentives, helping the company, advice seeking [Hennig-Thurau et al. 2004], obtaining product information, and learning to consume a product [Hennig-Thurau & Walsh 2003].

A virtual community is a venue for social interaction among online users. Two principle theories, economic exchange theory and social exchange theory, can explain the social interaction of people. Social exchange theory provides an important perspective for the study of interpersonal relationships. It predicts that people attempt to reciprocate to those who benefit them [Bateman and Organ 1983]. The easiness and inexpensiveness of digital information exchange on the Internet have profound motivational and behavioral effects [Kollock and Smith 1998], and the Internet facilitates exchange effectively by gathering a huge number of contributors and beneficiaries [Hemetsberger 2002]. While social exchange theory emphasizes the social-emotional aspects of the relationship among participants, economic exchange theory emphasizes the financial and more tangible aspects of the exchange relationship [Shore et al. 2006].

As discussed previously, participation in virtual communities includes passively viewing and actively posting, which was modeled as contribution of knowledge by several studies [Wasko and Faraj 2005; Kankanhalli et al. 2005; Bock and Kim 2002]. In order to share knowledge with others, individuals must deem their contribution to be worth the effort, thereby generating new value. They also expect to receive some of that value for themselves [Nahapiet and Ghoshal 1998]. The cost and benefit factors based on social exchange theory explain human behavior in social exchanges, the obligations of which are not clearly defined [Kankanhalli et al. 2005]. In addition, individuals engage in social interaction based on an expectation leading to a social reward such as status approval or respect [Blau 1964]. On the other hand, in economic exchanges, the benefits of interactions are extrinsic rewards such as bonuses, increased payment, or job security [Ba et al. 2001; Kankanhalli et al. 2005]. Interactions were considered as exchanges of rewards that are flexibly defined and include, for example, money, love, advice, social approval and appreciation, a smile, a promise of future help, or information [Balasubramanian and Mahajan 2001].

Social capital theory has become increasingly popular in a wide range of social science disciplines to explain the behavior of social interactions [Adler and Kwon 2002], and is defined as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit [Nahapiet and Ghoshal 1998]. It also refers to the amount and quality of communication about a community that occurs among its members within their social networks [Kavanaugh and Patterson 2001]. Social capital is comprised of resources that are retrieved through inter-personal social interactions; the resources place emphasis on the social relations which derive from social aspects and distinguished from economic and human capital [Jin 2013]. Therefore, this study makes use of the social capital theory, economic exchange theory, and social exchange theory as its theoretical bases.

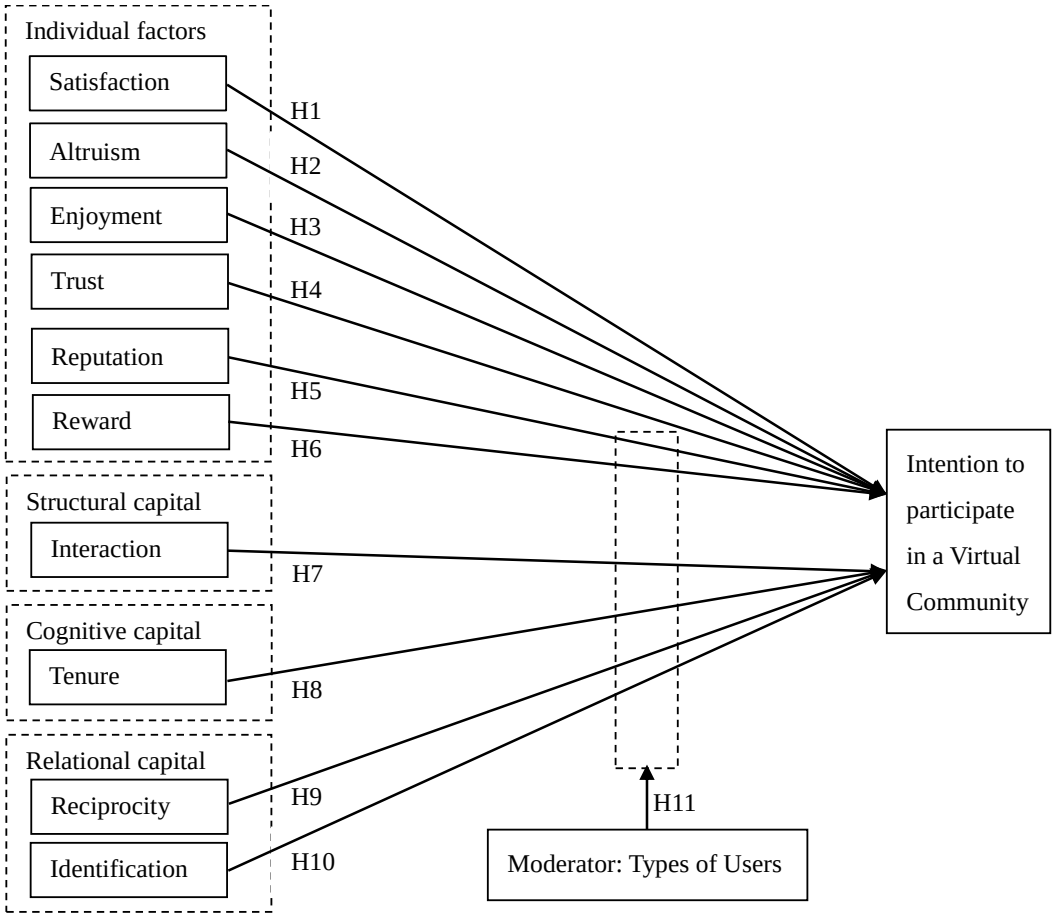

Figure 1: The Research Model for Virtual Community Participation

Figure 1 shows the research model for the hypotheses in this study. Hypotheses H1 to H4 are individual motivation factors collected from various literatures regarding participation in VCs. Reputation and reward are the factors modeled based on social exchange theory and economic exchange theory, respectively. H7 to H10 are social factors expected to have an impact on users' participation intention in VCs. The moderating effect of user type will be tested on the relationships between users' participation intention and the factors of reputation, reward, and all of the social capital. In the first stage, the factors governing the intention of viewers and posters to participate in virtual communities are tested and compared. In the second stage, the moderating effect of the types of user is studied through regression analysis. In the following sections I will discuss each of the constructs and their relationships to virtual community participation intention.

2.1. Individual Motivations

Customer satisfaction is essential to the success of e-commerce [Schaupp and Belanger 2005], and customers who have a high level of cumulative satisfaction will have a higher usage level of service [Bolten and Lemon 1999]. The same concept can also be applied to online service such as e-commerce [Green and Pearson 2011] and virtual communities [Casalo et al. 2008]. Member satisfaction was also found to be one of the success factors of virtual communities [Leimeister et al. 2006], and one of the motives for continuously using the information online [Jin et al. 2009]. A successful virtual community should have users continuously posting and viewing contents. When posters and viewers are satisfied with a site's online service, it is reasonable to assume they will return to the site for the same service. Therefore I propose:

H1a: Satisfaction is positively associated with a higher level of participation intention by passive users.
H1b: Satisfaction is positively associated with a higher level of participation intention by active users.

In addition to satisfaction, individuals may also receive intrinsic benefits by contributing knowledge that is equivalent to helping others [Wasko and Faraj 2005]. This benefit is derived from the concept of altruism, which is

the enduring tendency to think about the welfare and rights of other people, to feel concern and empathy for them, and to act in a way that benefits them [Curry et al. 2013]. It is one of the most consistent types of individual motivation related to the engagement in helping behaviors [Carlo et al. 1991], and one of the personality traits to have influences on posting product information [Román and Riquelme 2014]. Whereas posting is a way of contributing knowledge to help others, users' reviewing in many virtual communities indicates an endorsement of the knowledge they receive. It is also an act of helping because a poster can gain benefit by accumulating endorsements. Moreover, a significant correlation between altruism and participating was also found in open source projects [Hars and Qu 2002] and knowledge sharing [Wasko and Faraj 2000]. In both of these studies viewing and posting were included in the behavior of participation. Therefore, a second set of hypotheses predicts the following:

H2a: Altruism is positively associated with a higher level of participation intention by passive users.
H2b: Altruism is positively associated with a higher level of participation intention by active users.

Enjoyment was one of the values considered in a study of consumers' shopping behavior [Babin et al. 1994]. When extending the shopping to an online context, enjoyment was one of the factors which captured online transaction quality [Bauer et al. 2006], and it was a critical factor that reflected users' intrinsic acceptance of the World Wide Web [Moon and Kim 2001]. Users of a virtual community can derive enjoyment or pleasure from its contents and interactions with other members [Koh and Kim 2003]. After analyzing respondents from three technical online communities, the results showed that participation in the communities was fun [Wasko and Faraj 2000]. Another survey for blog usage also revealed that enjoyment had a significant influence on attitude that in turn may lead to participation intention [Hsu and Lin 2008]. When user hedonic needs are met by interacting with others and viewing the contents, they are likely to develop stronger intention toward their community. Therefore,

H3a: Enjoyment is positively associated with a higher level of participation intention by passive users.
H3b: Enjoyment is positively associated with a higher level of participation intention by active users.

Trust is a key element in establishing long-term customer relations in virtual communities [Chen et al. 2014], and it is an important factor in conducting transactions online [Enders et al. 2008]. A two-way interaction between participants and cooperation leads to the development of generalized norms of cooperation over time [Nahapiet and Ghoshal 1998]. In regard to online brand loyalty, trust is considered as a necessary antecedent of participation in a virtual community [Casalo et al. 2008]. The value of virtual communities to sponsoring firms is dependent on the sponsor's ability to cultivate trust with the members of communities, and the results showed that trust will motivate customers to share information with the sponsoring firm [Porter and Donthu 2008]. Since legal details cannot always be implemented, trust is an essential ingredient of long-term business engagements [Fukuyama 1995]. Furthermore, the lack of face-to-face contact in virtual communities increases the perceived risk of a relationship among users [Casalo et al. 2008], and the risk of exposure of personal information. Among surveying operators and members of virtual communities in the German-speaking Internet, handling member data sensitively is ranked as the number one success factor [Leimeister et al. 2006]. In another study, web-perceived individual impact is influenced by trust directly as well as moderating trust on usability and satisfaction [Riemenschneider et al. 2009]. The average number of denials of service attacks per day on the Internet increased exponentially during the period of one year [Mangelsdorf 2007]. It is no wonder that people are constantly questioning the issue of online security, and trust is clearly the most critical issue in determining why users, active or passive users, continue to use web services. Therefore I propose:

H4a: Trust is positively associated with a higher level of participation intention by passive users.
H4b: Trust is positively associated with a higher level of participation intention by active users.

Based on social exchange theory, users enhance their participation when expecting a social reward such as status approval or respect [Blau 1964]. In a study on users' intention to blog, reputation is positively related to the attitude toward using a blog, which leads to sharing knowledge [Hsu and Lin 2008]. It is also a significant factor in the participation in the electronic network of practice. Although viewers are considered free-riders [Kollock and Smith 1996], they are driven by the same factors affecting the posters who participate in VCs, if they are considered as potential posters [Ridings et al. 2006]. In VCs, website-based awarding mechanisms are commonly used to give special titles, representing a recognizable reputation for that website, to posters receiving more page-views, most of which come from viewers. Posters are motivated by this reputation and viewers, perceiving the benefit of receiving a title or some other positive acknowledgement often conferred to posters, are thus encouraged to participate in the

virtual community. In addition, some VCs such as FunP, which is considered in this study, have developed a system to recognize viewers who could accumulate points by participating in viewing activities, and those viewers with the highest points receive special recognition by having their names posted on the front page of the site. It can be considered as a motivation for them to enhance their viewing intention. This inference leads to the following set of hypotheses.

H5a: Reputation is positively associated with a higher level of participation intention by passive users.
H5b: Reputation is positively associated with a higher level of participation intention by active users.

Another important individual motivation is the reward provided by a web service to encourage user participation. At the organizational level, providing various types of rewards such as increased pay, bonuses, job security, or a promotion may serve to increase knowledge sharing [Ba et al. 2001]. Rewards are considered one of the extrinsic forms of motivation intended to increase participation in virtual communities [Cho et al. 2007]. When studying open-source communities, various types of rewards are identified, including indirectly increasing marketability and skill base, increasing revenues from related products and services, creating a new channel for self-marketing, peer recognition, and human capital [Hars and Qu 2002]. Reward also represents an independent motive for reading other consumers' online comments [Hennig-Thurau and Walsh 2003]. In practice, various forms of rewards are implemented for both viewers and posters to encourage user participation. For example, FunP offered free gifts on a monthly basis to those posters with increased page-views for their postings and to those users accumulating enough points by viewing activities. Participation is enhanced when the rewards of participating exceed the costs [Constant et al. 1994], which leads to the following hypotheses.

H6a: Rewards are positively associated with a higher level of participation intention by passive users.
H6b: Rewards are positively associated with a higher level of participation intention by active users.

2.2. Social Capital Theory

Nahapiet and Ghoshal [1998] examined the role of social capital in the creation of intellectual capital, and proposed that social capital, i.e., the network of relationships possessed by an individual and the set of resources embedded within it, strongly influences the extent to which interpersonal knowledge sharing occurs. They defined social capital in terms of three diverse dimensions: 1) structural capital represents links or connections between individuals; 2) the cognitive dimension focuses on the shared meaning and understanding that individuals or groups have with one another; and 3) relational capital refers to the personal relationships people have developed with each other through a history of interactions. Social status of the information posters will influence how helpful reviewers perceive [Zhu et al. 2014], and social capitals have been found to have impacts on both information seeking and giving [Chu and Kim 2011; Yeh and Choi 2011].

Structural Capital

Putman [1995] suggested that connections between individuals, or the structural links created through the social interactions between individuals in a network, are important predictors of collective action. This structural capital is the infrastructure of human capital that creates an environment which encourages individuals to create and leverage their knowledge by investing their human capital. Tsai and Ghoshal [1998] considered social interactions and ties as channels for information and resource flows. Individuals who occupy a central position within a collective have a relatively high proportion of direct ties to other members, and are likely to have developed the habit of cooperation [Wasko and Faraj 2005]. Moreover, such individuals are more likely to comply with group norms, which in turn lead to participation in a virtual community [Dholakia et al. 2004]. Social functions including building structural and identification capitals have positive effects on eWOM reading attitude, which leads to the reading intention [Reichelt et al. 2014]. Thus, the following set of hypotheses is:

H7a: Structural capital is positively associated with a higher level of participation intention by passive users.
H7b: Structural capital is positively associated with a higher level of participation intention by active users.

Cognitive Capital

Cognitive capital represents the shared meaning and understanding that individuals or groups have with one another. Shared language and vocabulary influence the conditions for knowledge exchange in several ways [Nahapiet and Ghoshal 1998]. First, they facilitate individuals' ability to gain access to others and their information. Second, a shared language provides a common conceptual apparatus for evaluating the likely benefits of knowledge exchange. Third, they enable the combining of information. As an individual interacts over time with others by

sharing knowledge and learning the norms of practices in a virtual community, that individual develops his/her cognitive capital. Consequently, exchange of information, such as seeking product information, most frequently occurs between individuals who share some qualities in common [Chu and Kim 2011]. When considering virtual communities as social networks, community members learn the intricacies of the specific virtual community through practice [Kim et al. 2007]. Individuals with a higher level of expertise are more likely to provide useful advice on computer networks [Constant et al. 1994]. Cognitive capital consists of mastering the application of expertise, which takes experience to build [Wasko and Faraj 2005]. It was found to have a direct and positive influence on members' continuous intention to create user-generated content at an early stage of online community development [Li et al. 2014]. Individuals with a longer tenure in shared practice are likely to better understand how their expertise is relevant and may thus be more highly motivated to share knowledge as well as utilize a knowledge-sharing mechanism [Enders et al. 2008]. In addition, tenure in the field strengthens a user's intention to participate in an open-source software virtual community [Bagozzi and Dholakia 2006]. Tenure in the field also has a positive effect on other types of online behavior, including the likelihood of purchase [Huang 2012]. From the discussions above, it appears that the shared meaning and understanding within a virtual community could exist among both passive and active users. This leads to the following hypotheses:

H8a: Higher cognitive capital is positively associated with a higher level of participation intention by passive users.

H8b: Higher cognitive capital is positively associated with a higher level of participation intention by active users.

Relational Capital

Reciprocity has been regarded as a benefit for individuals engaging in social exchange [Blau 1964], or as the belief that current contributions will lead to future requests for knowledge being met [Kankanhalli et al. 2005]. Norm reciprocity implies "actions that are contingent on rewarding reactions from others and that cease when these expected reactions are not forthcoming." [Blau 1964]. It is a highly productive component of social capital [Putman 1993], and a frequently cited reason for participation in virtual communities. Individuals sharing knowledge in online communities have a strong sense of reciprocity [Wasko and Faraj 2000], and evidence shows that reciprocity has a direct effect on knowledge sharing [Cheung et al. 2013]. In another study, reciprocity was defined as one of the perceived extrinsic sources of motivation which have a positive effect on an individual's use of a knowledge-sharing mechanism [Cho et al. 2007]. Although not clearly defined, the focuses of these studies are active users who are motivated by reciprocity to share their knowledge online. However, passive users are potential posters and might be encouraged by the same reason. Therefore, the following hypotheses have been developed accordingly:

H9a: Norm of reciprocity is positively associated with a higher level of participation intention by passive users.
H9b: Norm of reciprocity is positively associated with a higher level of participation intention by active users.

Identification is the process by means of which individuals see themselves as one with another person or group of people [Nahapiet and Ghoshal 1998]. In open-source projects exemplifying knowledge sharing, identification is one of the internal motivations for participation [Hars and Qu 2002]. In this study, users identify themselves as members of a community and align their goals with those of the community as a whole. Identification is also referred to as an individual's sense of belonging and a positive feeling toward a virtual community, which is similar to emotional attachment to the community [Chiu et al. 2006]. An emotionally-based social identity fosters loyalty and civic-mindedness to firms in marketing settings [Bhattacharya and Sen 2003]. Identification has positive effects on both intentions of giving and receiving information for online brand communities [Yeh and Choi 2011], and provide a strong motive toward eWOM [Hennig-Thurau and Walsh 2003]. Identification moderates the positive effect of reward toward participation [Kankanhalli et al. 2005], and enhances web-shoppers' loyalty [Thacher and George 2004]. After analyzing three virtual communities, results show that knowledge flows best when seekers and experts are considered members of the same community and thus share the same values, codes, and narratives [Wasko and Faraj 2000]. Viewers and posters are both members of online communities. Thus, I hypothesize that both viewers and posters are motivated by their identity in a virtual community:

H10a: Identification is positively associated with a higher level of participation intention by passive users.
H10b: Identification is positively associated with a higher level of participation intention by active users.

Few studies focus on the differences between viewers and posters. Lurkers differ significantly from posters, especially in their willingness to give information and exchange social support [Ridings et al. 2006]. From a survey of several virtual communities, the results indicated that the posting activity stimulant is not the same as the viewing activity stimulant. In an attempt to investigate the antecedents to eWOM, community identification is represented by two constructs, cognitive-based and affect-based trust. Affect-based trust has a stronger relationship with the information-giving intention than the information-seeking intention [Yeh and Choi 2011]. In general, viewers are less optimistic and less positive than posters [Nonnecke et al. 2006]. It is assumed that the type of user, either viewer or poster, plays an important role in the relationship between motivational factors and the intention to participate in virtual communities. As discussed earlier, both viewers and posters are part of the virtual community, but posters are usually positioned closer to the center of the online group. Posters are driven by social capital, since posting is, by definition, establishing a form of social capital [Nahapiet and Ghoshal 1998]. In addition, posters are motivated by reputation, the direct results of posting and responses of viewing. From the perspective of social exchange theory, posters perceive a positive outcome after considering all of the rewards and costs. Compared to viewers, posters make more efforts in the virtual community, and it is reasonable to predict that rewards and reputation have stronger effects on posters' participation than viewers' participation in the virtual community. Hence the hypothesis as follows:

H11: User type will moderate the effect of reward, reputation, and social capital factors on the intention to participate in virtual communities; the relationships between factors and intention to participate in virtual communities will be stronger for posters than for viewers.

3. Data Collection

The data were collected from a virtual community named FunP established in 2007. It is a well-known Web 2.0 service with most of its users from Taiwan, and is dedicated to sharing opinions on various topics such as politics, economics, culture, sports, entertainment, society, and so on. FunP established a mechanism to rank posters based on either their posting frequencies and/or the responses to their postings from other users. In general, users with a higher ranking are considered to have better reputations in this virtual community. The site also operated an award system in which users could accumulate points in exchange for free gifts. Points could be awarded by either posting or reading articles, and posting could receive more points than viewing. The list of free gift recipients was announced frequently so that all users could acknowledge them.

FunP was ranked in the top 30 among the virtual communities in Taiwan [Lo et al. 2010]. A survey from the users of a single web service provides this study with a clear classification for types of users, viewers and posters. In order to collect enough data from active users, a banner with a hyperlink connecting to a web survey was posted on its homepage for approximately one month and a mechanism was designed so that the banner would also be triggered whenever users are posting. To stimulate user participation in the survey, 100 randomly selected respondents were offered a gift certificate equivalent to the amount of $4, and another 30 randomly selected respondents were offered a theater ticket equivalent to the amount of $10 that could be redeemed at the largest chain theater in Taiwan. The first page of the questionnaire explained the purpose of this survey and ensured confidentiality.

After excluding 165 invalid questionnaires for various reasons, a total of 364 valid samples were available for analysis, yielding an effective rate of 68.8 percent. Invalid samples included incomplete questionnaires, answers with patterns, and respondents with less than four weeks of tenure or visiting the site only occasionally. An initial analysis of the data resulted in removing the respondents with tenure of one to three months for several reasons. First, this group of samples, more specifically viewers with tenure of one to three months, has several questions answered in the questionnaire significantly different from other samples. Second, discussions with several viewers of the site revealed that viewers with tenure of less than three months could still turn into posters in the future, and it is very likely viewers will stay unchanged after three months. Last, posters with the same tenure, one to three months, were also removed to have consistent profiles for both viewers and posters. The remaining data are based on a total of 293 samples.

The demographic information of the respondents indicate that the viewing users (lurkers or passive users) and the posting users (active users) have approximately the same proportions of all of the characteristics such as gender, occupation, age, and membership, respectively. In general, males outnumber females (57.5%, 42.7%, respectively); one-third of the respondents are students (35.5%); and the ratio of users with membership to users without membership is approximately 1.5 (60.8%, 39.2%, respectively). The profile of the sample basically matches expectations, with a higher proportion of male, student, and younger users. Note that most of the users in this study fall into the age range of 15 to 35. This distribution is similar to another survey [Riegner 2007]. The number of users

of Web 2.0-related sites decreases as age increases. Young users below 20 in this study account for a relatively lower proportion (12.9%) than expected, possibly because of cultural differences. For example, pre-college students in Asia have more homework and have limited access to computers. In addition, most of the demographic data of respondents resembles that of active online populations [Lin 2008].

4. Results and Analysis

4.1. Model Validation

Multi-item, five-point Liker scale items were used to measure the constructs in the model. Although pre-existing scales and items from the literature were applied wherever appropriate, some items were revised or added to suit the context of this study. Scales were developed based on the review of the most relevant literature as illustrated in Table 1. To ensure that face validity, defined as the degree to which respondents judge that items are appropriate to the targeted construct, and is consistent with content validity, the following iterative evaluation process was implemented [Zaichkowsky 1985]. A focus group interview (FGI), consisting of three posters and three viewers who are the users of the case company, was conducted to qualify each item as "clearly representative", "somewhat representative", or "not representative" of the construct of interest. An item without a high level of consensus observed among the participants was removed from further analysis [Lichtenstein et al. 1990].

Table 1: Content Validity

Construct	Adapted from	Items*
Satisfaction (SAT)	Hong et al. [2006]; Collier and Bienstock [2006]	2(4)
Altruism (ALT)	Kankanhalli et al. [2005]; Jarvenpaa and Staples [2000]	2(3)
Enjoyment (JOY)	Van der Heijden at al. [2003]; Hassanein and Head [2007]	3(4)
Trust (TRU)	Ratnasingam [2004]; Casalo et al. [2008]	3(3)
Reputation (REP)	Wasko and Faraj [2005]; Hsu and Lin [2008]	2(3)
Reward (REW)	Bock et al. [2005]; Cho et al. [2007]	2(3)
Structural (STR)	Dholakia et al. [2004]; Kim et al. [2007]; Chiu et al. [2006]	3(4)
Cognitive (COG)	Chiu et al. [2006]; Wasko and Farja [2005]	2(4)
Reciprocity (REC)	Wasko and Faraj [2005]; Judge at al. [1997]	2(4)
Identification (IDE)	Kankanhalli et al. [2005]; Dholakia et al. [2004]; Martin et al. [2013]	3(4)
Intention to participate (INT)	Bagozzi and Dholakia [2006]	2(3)

*Item numbers after content validation (initial item number)

To further validate the measurement model, two types of validity were examined, convergent validity and discriminant validity. As suggested [Hair et al. 2010], confirmatory factor analysis was first conducted to assess the measurement model. Initially, an exploratory factory analysis (EFA) was used to purify the measures with a total of 39 items, which were reduced to 26 once items with low loadings and high cross loadings were eliminated.

Common method variance (CMV) is a potential problem when conducting a survey to collect data [Podsakoff et al. 2003]. Remedies applied to single source studies can be categorized into two groups and this study falls into the category involving remedies that statistically detect and/or control for CMV after the data have been collected [Craighead et al. 2011]. According to one study [Malhotra et al. 2006], the most commonly used statistical remedy was Harman's single-factor test [Harman 1976]. This test examines whether the majority of the variance can be explained by a single factor. When limiting the number of factors extracted in exploratory factor analysis (EFA) to just one, the variance explained by one factor accounts for 25.11% of the model. Therefore, the data not showing a significant CMV problem were available for further analysis.

Composite reliability is analogous to the Cronbach alpha indicator [Bagozzi and Yi 1988], whereas the average variance extracted (AVE) estimates the amount of variance captured by a construct's measure relative to random measurement error [Fornell and Larcker 1981]. Estimates of composite reliability above 0.7 and AVE above 0.5 are considered supportive of internal consistency [Bagozzi and Yi 1988]. Composite reliability value for the scales in Table 2 indicates uniformly high reliabilities ranging between .84 and .93. They all passed the recommended lower limit of 0.7.

Table 2: Summary of Measurement Scales

Construct and Measures
Satisfaction (SAT) Composite reliability=.87
SAT1: In general, I am pleased with the service experience on this site.
SAT2: I am satisfied with the services this site provided.
Altruism (ALT) Composite reliability=.93
ALT1: Participation in this site is a way of helping others
ALT2: I enjoy helping others in this site
Enjoyment (JOY) Composite reliability=.90
JOY1: I found my visit to this site enjoyable
JOY2: I found my visit to this site interesting
JOY3: I found my visit to this site pleasant
Trust (TRU) Composite reliability=.86
TRU1: I believe my privacy will be protected when visiting this website
TRU2: I believe this website would not make use of my personal information
TRU3: I believe this website would not reveal my personal information to others
Reputation (REP) Composite reliability=.91
REP1: I earn respect from others by participating in this site
REP2: Participating in this website would enhance my personal reputation in this virtual community
Reward (REW) Composite reliability=.93
REW1: I am attracted by the free gifts offered in this website
REW2: Accumulating points in this website is important to me
Structural capital (STR) Composite reliability=.84
STR1: Participating in this website will enhance my relations with other members*
STR2: Participating in this website will help me make new friends
STR3: Participating in this website will help me make friends with common interests
Cognitive capital (COG) Composite reliability=.85
COG1: How long have you been visiting this website?
COG2: Users in this website use understandable communication patterns during discussions
Reciprocity (REC) Composite reliability=.90
REC1: I know that other members* will help me, so it's only fair to help other members*
REC2: I believe that someone would help me if I were in a similar situation
Identification (IDE) Composite reliability=.87
IDE1: I feel a sense of belonging toward this website
IDE2: It is important for me to be considered as a member of this website
IDE3: I expect to remain in this virtual community for a long time
Intention to participate (INT) Composite reliability=.88
INT1: I have the intention to interact with other users
INT2: I will continuously visit this website

Note:

- Composite reliability is calculated based on passive users, active users, and the entire data set, respectively. However, the item reliabilities of passive and active users do not show significant difference and only the results calculated based on the entire data set are presented.
- *: Although the case website has requested its users to sign on as members, the "members" used in questionnaires represent common users. I have ensured that the respondents understand the differences.

The factor loadings of each item ranging from 0.63 to 0.90 are shown in Table 3. According to the suggested guideline [Comrey 1973], loadings of 0.45 to 0.54 are considered fair, 0.55 to 0.62 are considered good, 0.63 to 0.70 are considered very good, and above 0.71 are considered excellent. With the exception of two loadings in the range of very good, all the others were in the range of excellent. I also checked the loadings of each item and no significant cross-loadings among constructs were observed. Next, convergent validity was assessed by examining composite reliability and average variance extracted from the measures [Hair et al. 2010].

Table 3: Factor Analysis and Construct

	SAT	ALT	JOY	TRU	REP	REW	STR	COG	REC	IDE	INT
SAT1	**0.77**	0.15	0.02	0.03	0.06	0.07	0.28	0.14	-0.09	0.20	0.04
SAT2	**0.79**	0.02	0.17	0.04	0.16	0.20	0.18	0.11	-0.01	0.12	0.03
ALT1	0.09	**0.87**	0.19	0.07	0.07	-0.05	0.12	-0.01	-0.02	0.16	0.08
ALT2	0.06	**0.90**	0.13	0.11	0.08	0.04	0.08	0.05	-0.07	0.14	0.03
JOY1	0.04	0.17	**0.74**	0.25	0.10	0.06	0.12	0.06	-0.03	0.25	0.16
JOY2	0.04	0.17	**0.85**	0.09	0.17	0.08	0.08	0.12	-0.01	0.15	0.05
JOY3	0.17	0.07	**0.78**	0.08	0.19	0.23	0.11	0.02	-0.02	0.13	0.14
TRU1	0.16	0.01	0.08	**0.83**	0.23	0.00	0.14	0.08	0.02	0.05	0.00
TRU2	0.13	0.17	0.22	**0.74**	0.11	0.08	0.04	0.18	-0.04	0.13	0.08
TRU3	0.27	0.04	0.07	**0.72**	-0.07	0.15	-0.07	0.06	-0.16	0.12	0.30
REP1	0.05	0.15	0.21	0.08	**0.68**	0.18	0.17	0.15	-0.07	0.26	0.15
REP2	0.08	0.04	0.22	0.10	**0.74**	0.04	0.21	0.14	0.03	0.19	0.29
REW1	0.12	-0.01	0.15	0.12	0.24	**0.82**	0.10	0.05	0.00	0.02	0.21
REW2	0.13	0.00	0.14	0.07	0.11	**0.88**	0.14	0.07	-0.04	0.09	0.10
STR1	0.21	0.08	0.13	0.11	0.16	-0.07	**0.71**	0.03	-0.04	0.17	0.25
STR2	0.24	0.08	0.08	-0.01	0.14	0.17	**0.84**	0.05	0.06	0.09	0.05
STR3	0.05	0.08	0.10	0.05	0.11	0.16	**0.87**	0.15	0.07	0.11	0.04
COG1	0.05	-0.03	0.14	0.07	0.16	0.13	0.15	**0.88**	0.02	0.05	0.09
COG2	0.30	0.10	0.02	0.29	0.18	-0.02	0.05	**0.72**	-0.07	0.15	0.14
REC1	0.00	0.01	0.03	-0.09	0.02	0.07	0.11	0.02	**0.90**	-0.02	-0.06
REC2	-0.08	-0.10	-0.07	-0.02	-0.05	-0.11	-0.03	-0.04	**0.90**	-0.02	0.04
IDEN1	0.17	0.09	0.03	0.04	0.04	-0.06	0.18	0.08	-0.05	**0.76**	0.12
IDEN2	0.10	0.11	0.05	0.16	-0.09	0.08	0.11	0.03	0.02	**0.81**	-0.06
IDEN3	0.08	0.20	0.07	0.10	0.14	0.17	0.05	0.10	-0.03	**0.66**	0.16
INT1	0.19	0.11	0.14	0.18	0.16	0.18	0.18	0.07	-0.01	0.09	**0.80**
INT2	0.21	0.01	0.27	0.18	0.28	0.26	0.15	0.28	0.00	0.06	**0.63**

I verified the discriminant validity by examining the square root of the average variance extracted as recommended [Fornell and Larcker 1981]. The results in Table 4 show that the square root of the AVE for each construct is greater than the correlation shared between the construct and other constructs in the model. Since few correlations are relatively high, I also examined the multicollinearity among constructs. The variance inflation factor (VIF) values for all of the constructs are acceptable with a range of (1.05-1.89). The average variance extracted for the constructs in the measurement model ranges between .67 and .87, higher than the recommended level of 0.5.

Table 4: Correlations among Constructs and Average Variance Extracted

Construct	AVE	Construct										
		SAT	ALT	JOY	TRU	REP	REW	STR	COG	REC	IDE	INT
SAT	0.77	0.88										
ALT	0.87	0.24	0.93									
JOY	0.75	0.33	0.44	0.87								
TRU	0.67	0.56	0.27	0.40	0.82							
REP	0.77	0.36	0.25	0.48	0.34	0.88						
REW	0.87	0.35	0.09	0.39	0.27	0.44	0.93					
STR	0.76	0.45	0.27	0.33	0.19	0.40	0.30	0.87				
COG	0.75	0.30	0.07	0.32	0.35	0.44	0.34	0.32	0.86			
REC	0.83	-0.12	-0.13	-0.12	-0.17	-0.10	-0.09	-0.01	-0.06	0.91		
IDE	0.69	0.40	0.40	0.25	0.37	0.20	0.27	0.34	0.32	-0.12	0.83	
INT	0.79	0.55	0.19	0.44	0.40	0.53	0.42	0.34	0.45	-0.12	0.34	0.89

The diagonals represent the square root of average variance extracted (AVE) and off-diagonals are the correlations among constructs.

A second way to evaluate convergent and discriminant validity is to examine the factor loading of each indicator. Factor loadings and cross-loading were calculated and presented in Table 3. Each indicator has loading

larger than the value of 0.6 and higher than the construct of interest than on any other factor [Chin 1998]. In sum, the results of content validity, convergent validity, and discriminant validity enable this study to proceed to estimations of the regression models.

4.2. Empirical Results

Latent constructs for which multiple items are available are combined into one indicator according to the partial disaggregation model [Bagozzi and Edwards 1999]. In contrast to models for which every item is a separate indicator, this yields models with fewer parameters to estimate, and better ratios of cases to parameters, while reducing measurement errors to a certain extent.

To distinguish viewers from posters, a question was asked to identify what type of user the respondents considered themselves to be. Out of 293 effective samples, 116 were posters, accounting for 39.6 % of the total sample. The intention to participate in a virtual community was tested for viewers and posters, respectively, using regression analysis. Regression has been widely applied to study various topics [Shenkar and Li 1999; Karniouchina et al. 2009], and the results are shown in Table 5. Due to the small number of samples, only *p* value less than 0.05 (one or two asterisks) is considered significant.

Table 5: Regression Results for Viewers and Posters, Respectively

		Viewers		Poster		Coefficient difference (poster-viewer)	
		Standardized Coefficient	*t* value	Standardized Coefficient	*t* value	Standardized Coefficient	*t* value
	Gender	0.06	0.88	0.03	0.41		
	Age	0.06	1.03	-0.04	-0.59		
	Avg./day	-0.05	-0.69	0.00	0.04		
	Membership	0.00	0.02	0.05	0.67		
	Frequency	-0.04	-0.50	-0.07	-0.86		
	Avg./visit	-0.07	-0.93	-0.08	-0.98		
H1	Satisfaction	-0.04	-0.50	-0.02	-0.11	0.05	0.17
H2	Altruism	0.04	0.50	0.06	0.82	-0.03	-0.14
H3	Enjoyment	0.26	3.16**	-0.02	-0.23	-0.71	-2.24*
H4	Trust	0.23	3.11**	0.18	2.09*	-0.11	-0.43
H5	Reputation	0.12	1.29	0.21	2.11*	0.33	0.85
H6	Reward	0.14	1.86*	0.24	3.04**	0.37	1.31
H7	Structural	0.25	3.12**	0.18	2.11*	-0.13	-0.46
H8	Cognitive	0.14	1.97*	0.24	2.47**	0.18	0.52
H9	Reciprocity	-0.04	-0.57	0.14	1.86*	0.17	1.80*
H10	Identification	-0.04	-0.44	-0.04	-0.54	-0.13	-0.10
	R^2	0.51		0.48		0.56	
	Adjusted R^2	0.45		0.41		0.53	
	F	8.57**		6.84**		18.00**	

Note: **: $p < 0.01$; *: $p < 0.05$;

Along with the ten factors to be tested, six demographic variables including gender, age, average online time per day (avg./day), membership, frequency of visiting the site, and average time per visit (avg./visit) are included in the regression models as control variables. To test the differences between the two corresponding coefficients for each factor, a dummy variable, 1 for poster and 0 for viewer, was introduced to the regression model. In addition to the ten variables, the dummy variable multiplies each variable generating ten more variables. Testing the coefficients of these ten added variables in the regression model is equivalent to testing the differences of the corresponding coefficients. Since the control variables are insignificant for the regression models of viewer and poster, they are excluded from the coefficient difference test and moderating analysis. Results are shown in the two rightmost columns in Table 6.

All of the regression models are significant at 0.01, and the difference between R^2 and adjusted R^2 indicates no over-fitting problem for the number of independent variables. Regression models for viewer and poster intentions explain 51 and 48 percent of the variance, respectively. Both of the R^2 are significant at the 0.01 level. For viewers, H3a, H4a, H6a, H7a, and H8a are supported. Enjoyment, trust, rewards, structural capital, and cognitive capital have a significantly positive effect on viewers' intention to participate in the virtual community. H1a, H2a, H5a, H9a and H10a are not supported. Satisfaction, altruism, reputation, reciprocity capital and identification capital have no

significant relationship with the participation intention of viewers. Variables showing significant effects on the posters' intention are trust, reputation, reward, structural capital, cognitive capital, and reciprocity, which support hypotheses H4b, H5b, H6b, H7b, H8b and H9b. H1b, H2b, H3b and H10b are not supported, indicating that satisfaction, altruism, enjoyment, and identification have insignificant relationships with the posters' intention to participate in the virtual community. Note that both viewers and posters behave in a similar way with respect to the variables of satisfaction, altruism, trust, reward, structural capital, cognitive capital, and identification. Reward, structural capital, cognitive capital, and trust are all positively significant while satisfaction, altruism, and identification are insignificant. Enjoyment and reciprocity have divergent results for viewers and posters. For the test of coefficient differences, two are significant at 0.05. The coefficients of reciprocity are significantly higher for posters than for viewers, and the coefficient of enjoyment is significantly higher for viewers than for posters.

The moderator effect in multiple regression is represented by a compound variable formed by multiplying the independent variable with the moderator variable, which is included in the regression equation. The interaction term in multiple regression is commonly used to test the significance of moderators either in the study of information systems [Kankanhalli et al. 2005; Joreskog and Sorbom 1996; McKeen et al. 1994] or other disciplines [Jehn et al. 1999; Voss et al. 2004]. The procedure first tests the relationship between dependent and independent constructs, and then tests the model with the additional interaction term. A significant change in explanatory power between the two steps, which can be measured by the increase of the sum of the squared regression and can be assessed by examining the significance of *F* value, indicates the presence of moderating effects.

Table 6: Results of the Regressions for Testing Moderating Effects

Step 1		
	Standardized Coefficient	*t* value
Type	0.25	5.99**
Satisfaction	-0.04	-0.82
Altruism	0.04	0.93
Enjoyment	0.11	2.16*
Trust	0.19	3.92**
Reputation	0.17	2.99*
Reward	0.17	3.56**
Structural	0.16	3.28**
Cognitive	0.18	3.58**
Reciprocity	0.01	0.30
Identification	-0.03	-0.54
R^2	0.542	
Adjusted R^2	0.524	
F	31.040**	
Step 2		
Interaction term		
Type*Reputation	0.14	0.35
Type*Reward	0.45	1.65*
Type*Structural	0.07	0.23
Type*Cognitive	0.20	0.61
Type*Reciprocity	0.18	1.87*
Type*Identification	-0.26	-0.93
R^2	0.552	
Adjusted R^2	0.525	
F	20.518**	
R^2 change	0.010	
F for the R^2 change	6.625**	

**: $p < 0.01$; *: $p < 0.05$

Table 6 summarizes the results for testing the main effect of the independent constructs on the dependent variable, which is the intention to participate. I tested the relationship between dependent and independent constructs in step 1 and included the additional interaction terms in step 2. A dummy variable 'Type', 1 for poster and 0 for

viewer, was introduced to the regression model. Most of the variables are significant in the main effects test in step 1 except for satisfaction, altruism, reciprocity capital, and identification capital. Reciprocity and identification are included in the moderator analysis because they present important research implications for both posters and viewers. In the second step, in which the interaction terms test the moderating effects, two moderating effects are significant: the significantly positive relationships between reward and participation behavior, and the relationship between reciprocity and participation behavior are stronger for posters. These results are consistent with the coefficient difference test presented in Table 5 where coefficients of reward and reciprocity are higher in the regression model for posters than for viewers. Along with the significance of the type of user in the main effect regression, the hypothesis of H11 is mostly unsupported, viz., that user type will moderate only the effect of reward on the intention to participate in virtual communities. Although the moderating effect of user type on reciprocity is significant with t=1.86, the insignificance of reciprocity at step 1 greatly reduce its credibility of moderating the effect test at step 2.

5. Conclusions and Discussion

5.1. Conclusions

The tests of the hypotheses are summarized in Table 7. I should note that there are several limitations to this study, requiring further examination and additional research to be discussed later. First, this study surveyed users only on a website. Second, this research assumes that viewers and posters are two different types of users, and distinguishing viewers from posters is by a self-answered question, not by substantial evidences such as the count of posting. Third, users' behaviors are measured by their intention, not by their actual behaviors.

Table 7: Summarized Results of the Hypotheses Tests

Hypotheses		Results	
		Viewer (a)	Poster (b)
H1	Satisfaction is positively associated with a higher level of participation	Not supported	Not supported
H2	Altruism is positively associated with a higher level of participation	Not supported	Not supported
H3	Enjoyment is positively associated with a higher level of participation	Supported	Not supported
H4	Trust is positively associated with a higher level of participation	Supported	Supported
H5	Reputation is positively associated with a higher level of participation	Not supported	Supported
H6	Rewards are positively associated with a higher level of participation	Supported	Supported
H7	Structural capital is positively associated with a higher level of participation	Supported	Supported
H8	Higher cognitive capital is positively associated with a higher level of participation	Supported	Supported
H9	Norm of reciprocity is positively associated with a higher level of participation	Not supported	Supported
H10	Identification is positively associated with a higher level of participation	Not supported	Not supported
H11	User type will moderate the effect of factors on the intention to participate in virtual communities	Mostly not supported	

In addition to the objectives mentioned in the introduction section, this work was also motivated by a research [Wasko and Faraj 2005] that investigated how the individual motivations and social capitals affected users' behavior on an electronic network that is equivalent to social network sites in this research. By taking their work as the foundation, this study broadened the scope and included more variables in the models. Although the context and approaches are similar between this research and that of Wasko and Faraj's, several differences distinguish these two studies. First, Wasko and Faraj examined the factors affecting the behavior of knowledge contribution that was measured by respondents' message posting. In this study, both the posting and reviewing intentions by respondents were measured and included in the research models. Second, this study has several additional individual motivation variables, not considered in Wasko and Faraj's model, including satisfaction, enjoyment, trust, and reward. Third, in order to have more reliable results of the causal relationships between independent and dependent variables, this study included several demographic variables in the regression models including gender, age, average online time per day, membership, frequency of visiting the site, and average time per visit. Fourth, the samples of the web site in Wasko and Faraj's study were legal professionals and participation in the virtual communities was free. Based on a study [Chea and Luo 2008], the results of e-services free of charge may not be applicable to other services.

However, this study collected samples from a commercial social network site where the respondents represented regular users. Last, the samples needed to log into the system and therefore were all members of the web service in Wasko and Faraj's study. In contrast, membership of the samples in this study is a factor hypothesized to moderate the relationship between the independent factors and users' behavior intention.

By focusing on the users' behavior in virtual communities, this research is one of the few investigating both viewers and posters, and it compared and tested the differences of the behaviors from two type of users, posters and viewers. In addition, whereas most literature used nonprofit online service as the research target and their results might not be generalized to users of commercial online services, the samples of this study are regular users from a web site attracting users and collecting fees from advertisers. From a practical perspective, the results of this study provide better references for web service operators. Theoretically, the results showed that posters and viewers participate in a virtual community with different purposes in mind and their status of membership moderates one of the participating causes. I should also note that the web service providing samples for this study, FunP, lost its status as one of the top ranking websites in Taiwan a few years after the survey had been conducted in 2010 and closed its service in 2014 [FunP, 2014]. Therefore, the analysis of the results might explain why a VC could not sustain its operation and this detail will be discussed later in managerial implications. Below is a summary of the findings from this research.

Reward is the individual factor significant for both posters and viewers in their participating behavior, and it might serve as a salient motivator for knowledge contributors when the identification factor is weak [Kankanhalli et al. 2005]. Various types of reward systems are commonly observed for online services at their early development stage. However, it is usually not cost effective and certainly not a long-term solution for web service development.

Trust, another factor significant for both types of users, is the most important factor for a successful virtual community from the perspective of members as well as operators [Lee et al. 2000], and it is also positively related to the quality of knowledge sharing [Chiu et al. 2006]. Trust is an antecedent factor for participating in virtual brand communities [Casalo et al. 2008] and plays the same important role for any user to participate in a website on a continuous basis.

Satisfaction is insignificant for both types of users. The effect of satisfaction toward participation is likely mediated by other factors such as trust [Casalo et al. 2008] (correlation of 0.56 in Table 5), and the multicollinearity between satisfaction and other factors reduces its unique explanatory power for variance of the dependent variable. Reputation is the factor applied only for posters, since the posters collecting enough views for their postings would receive special titles online. Although reviewers can also receive recognition in FunP, it is not as strong as those received by posters.

Viewers are motivated by enjoyment, a factor that does not play an important role for posters' participation intention. One study concluded that VC members enjoy sharing knowledge with others to empower people to help themselves (altruism) and it is nice to feel like an expert (reputation) [Wasko and Faraj 2000]. The effect of enjoyment perceived by posters on their participation intention could be explained by altruism (correlation of 0.44 in Table 5) and reputation (correlation of 0.48 in Table 5) in the regression model. In addition, enjoyment was not mentioned by the FGI participants who strongly suggested that reputation and reward, the two significant individual factors in the regression model, are the drivers for posters' participating intention. On the other hand, viewers are driven by enjoyment because they enjoy reading multiple articles on a single topic, particularly when such articles present different, or even opposed points of view. Perceived enjoyment is an important factor predicting the intention to use a pleasure-oriented information system [Van der Heijden 2004], and perhaps the lack of ability to create a fun experience for its posters is one of the reasons FunP failed to stay in operation.

Reward is the most significant predictor for posters' participation intention, and its impact on viewers' intention is significant, but the least among the significant factors. Prior studies had controversial results regarding the role of reward in participating in VCs. Several studies [Bock and Kim 2002; Bock et al. 2005; Cho et al. 2007], under the settings of interacting within organizations, had extrinsic rewards negatively associated with knowledge sharing. However, in another study investigating students' behavior in virtual projects, its results, indicating reward as the strongest factor positively associated with knowledge sharing [Zhang et al. 2009], were consistent with those of this study. User attitude toward the VCs might explain the differences. In an organizational setting, users might perceive their participation in the VCs as an obligation, and enjoying helping others was usually one of the strong predictors for participating in VCs [Kankanhalli et al. 2005; Wasko and Faraj 2005]. In this study, users joined the VC voluntarily and the switching costs were relatively low. Their behaviors were driven by reward, while altruism had little effect on their participating intention.

Altruism is another individual factor without substantial impact on either type of user participation. A previous study showed that a higher sense of belonging can increase the participation of helping others when the group need is emphasized [Fisher and Ackerman 1998]. The measure of altruism (3.1 and 3.2 for the first and second questions,

respectively) and identification (3.2, 3.3, and 3.3 for the first, second, and third questions, respectively), representing the sense of belonging, are relatively low compared to other measures. When users do not feel they are part of the community, they tend not to have a strong intention to help others. This also explains why H10 is the hypothesis unsupported for viewers and posters alike. The case company was established relatively recently, and it is very likely still at an early stage of development. Its users have not established a strong sense of belonging toward this virtual community, and therefore identification is irrelevant to the participation intention.

In addition to the individual factor of reward, structural capital and cognitive capital are significant factors related to the intention to participate regardless of whether users are viewers or posters. For structural capital, the results are similar to those of another study [Wasko and Faraj 2005], despite the slightly different measures applied. Cognitive capital has consistent results for viewers and posters. The longer users stayed in this VC, the stronger their intention to participate and the better their understanding of the communication patterns used in this VC. As for reciprocity, it affects the intention of posters, but not viewers, to participate. These results are very similar to those of another study [Cho et al. 2007] in which reciprocity had a significant effect on the intention to use knowledge-sharing mechanisms and had an insignificant effect on knowledge-sharing intention. Results for the impact of relational capital on users' participation intention partially conform to another study [Wasko and Faraj 2005) in which commitment, defined as a sense of commitment similar to identification in this study, tested insignificantly. This result seems to be consistent with the argument that relational capital may not develop in electronic networks due to a lack of shared history, high interdependence, frequent interactions, and co-presence [Cohen and Prusak 2001].

User type was tested significantly for moderating the relationship between participating intentions and reciprocity. However, this finding is not statistically sound, due to the insignificant reciprocity in the regression model (refer to Table 6). The relationship between participation intention and reward is stronger for posters than for viewers. In general, posters' intention of participation is highly affected by benefit and cost factors in which reward is a tangible benefit, explained by economic theory, and reciprocity is intangible benefits, explained by social exchange theory [Zhang et al. 2009].

Viewing and posting in this study are similar to receiving and giving information for eWOM research, respectively [Yeh and Choi 2011; Chu and Kim 2011]. The results of this study suggest that compared to receivers, senders are more affected by benefit and cost aspects including tangible factors like reward, and intangible factors such as reputation and reciprocity. However, this study did not specify what type of information was to be viewed and posted, while eWOM research focused only on information of products and the users, information senders and seekers are consumers of the products. Examples of studied online services include Amazon.com [Bao 2015; Bao and Chang 2014] and Gamespot.com [Yang et al. 2012]. Amazon.com and Gamespot.com are online services collecting revenue primarily by retailing or charging transactions, while FunP operated an advertising model by attracting advertisers with its high traffic flow. The operation of VC is more important in FunP than in Amazon.com and Gamespot.com. From the results of this study, it is possible that a sense of belonging toward the VC is vital, and perhaps this was the reason for the failure of FunP. On the other hand, quality and quantity of eWOM play important roles driving the intention of senders and receivers and eWOM has proved to be a two-way transaction between information seekers and senders [Bao 2015; Bao and Chang 2014]. Although some social factors also tested positive [Yeh and Choi 2011] and considered important motivations for sending and receiving eWOM [Berger 2014], social factors are more important for a VC-based online service like FunP than an e-commerce based web site like Amazon.com. A practical example is the acquiring of Atlaspost.com by Groupon.com in 2010 [Wee 2010]. Atlaspost.com was established in 2007 and was ranked among the top 20 VCs in Taiwan [Lo et al. 2010]. However, Groupon.com closed its VC service in 2011 after merging with Atlaspost.com [Lo 2011], because it did not provide substantial benefits to its primary service, group buying.

Although the results of this study could be applied to the research for eWOM, a difference between this study and those for eWOM, in addition to the revenue model (VC-based advertising model vs. e-commerce based model), requires further investigation. By asking individuals whether they were viewers or posters, and deleting samples with tenure of less than three months, posters and viewers in this study were separated and considered as two types of users. In contrast, users in eWOM literature could have multiple behaviors including seeking, passing, and sending information [Yeh and Choi 2011; Chu and Kim 2011; Kim et al. 2016].

5.2. Managerial Implications

Web operators should continue their reward system because it is the best way to motivate both viewers and posters. Nevertheless, the reward system requires a significant amount of resources and a company will not be able to match pace with the increase in users if it is to grow exponentially. Strengthening the sense of community builds loyalty among users and encourages them to revisit the site on a continuous basis, thereby reinforcing purchasing behavior [Thacher and George 2004]. The weak identification according to the survey indicates that the users of this

site still lack a sense of community. Offering offline activities which have a positive impact on user participation [Lin 2008], and making use of multimedia are suggested means of elevating a sense of belonging [Koh et al. 2007]. The initiation of offline activities is another unresolved issue concerning which activities can be activated by web operators or users. Utilizing multimedia seems to comply with the principle of Web 2.0 and will help the community grow on its own without additional resources, but offline activities are better controlled and monitored by web management.

Posters are motivated by reputation, and viewers seem to be affected, but not significantly, by the same factor. This implies that web management could develop a mechanism for its viewers to be recognized by other users. Although a possible reason is that viewers are attracted to becoming posters and enjoying an enhanced reputation, this case site had a mechanism for viewers to be recognized by others. The users who accumulate a large number of points by either posting or viewing could earn free gifts provided by this site. Their names are announced so that other users could recognize them. Although this might not be cost effective, website operators could apply this concept, while minimizing the amount of resources utilized. The significance of structural capital to users' participation intention indicates that web services should continue to enhance their platform facilitating the interaction of users. A more efficient way to categorize various topics of interest might be helpful, and broadening the range of topics could attract more new users and increase their interactions. In addition, initiating some offline activities should help build up structural capital, but expenses incurred need to be carefully monitored. The cognitive factor affects the participation intention of both viewers and posters. To ensure long-term users, a web service needs to focus on both current and new users. Although many newly developed web services use various ways to attract new users, keeping the current user is a key factor to continuously grow the website.

Trust is the most essential element of a web service and the value of a virtual community is dependent upon how the web operator is able to cultivate trust among the community's users [Porter and Donthu 2008]. Site management should be very careful when handling the personal information of its members. The usage of cookies is an important factor impacting user trust toward the website. Several suggestions are proposed, including a noticeable and understandable disclosure of cookie use, an option of deleting categories of cookies, and a note that the original domain cookies may be used by a third party [Miyazaki 2008]. Since the degree of participating intention motivated by trust is higher for posters than for viewers, the website management should direct its resources more on posters with respect to security so that their trust in virtual communities remains strong. Reciprocity is insignificant for posters possibly because they do not feel the need for receiving help from others at this site. The web operator can consider establishing a direct connection between content providers and receivers. For example, an area can be designated where users can post certain questions on topics of interest to be answered by other users.

Based on an interview with a practitioner, the case site was closed mainly because of insufficient revenues to continue its operation. However, it had difficulty earlier to attract users. When online advertising served as its revenue model, the inability to increase the number of users to a critical amount led to ultimate failure [Hagel III and Armstrong 1997]. Therefore, the results of this study might be able to provide some explanation to account for this. First, this site relied on reward as the most influential factor for posters and as a significant factor for viewers. However, the growth of advertising revenue is unlikely to compensate for the required sources needed for the reward system, while posters are motivated mainly by benefit and cost factors such as reputation, reward, and reciprocity. Second, both viewers and posters failed to establish a strong sense of belonging toward the site, and neither viewers nor posters were willing to participate because their behavior could help others. Furthermore, posters were not motivated by enjoyment, a factor usually found significant for knowledge sharing intention. It would be expected to observe that the posting would reach a steady state and viewers who were attracted by the contents would also be greatly affected with no significant increase. Consequently, the site would experience a shortage of cash flow forcing it to cease operation. When an online service relies heavily on the operation of its VC, attracting users is definitely a key factor at the initial stage of the website. However, monitoring users and making sure of the presence of a strong sense of belonging among users are also equally important issues.

5.3. Limitations and Future Research

Several limitations of this study indicate the need for further studies. First, although it is appropriate to survey users only on a website that is noticeably a representative of a VC, considering the purpose of this study and the measures needed to test the differences between the two types of user, an extensive survey on multiple web services should provide more convincing results. Second, this study assumes that viewers and posters are two different types of users affected by social and personal factors. However, the in-depth interviews with the posters indicate that a great percentage of posters were former viewers. It is still unclear why and how such a transformation takes place. It could be caused by external factors such as social norms or stress, or by certain internal characteristics that a person is more willing to share. Ridings et al. [2006] compared three groups, lurkers, infrequent posters and posters, and provided insights regarding their differences. Although the demographic data in this study shows no significant

difference between viewers and posters, a study indicated that they differed in several aspects [Nonnecke et al. 2006]. Posters feel their needs are better met, perceive more benefit, and feel a greater sense of membership. Lurkers have less respect for posters, and posters consider lurkers to be members more than lurkers themselves do. Becoming a member of an online community is different for posters and lurkers for 10 out of 14 reasons. Based on their results and this study, it is surmised that longitudinal data would be very useful in understanding how users change their states of visiting, how viewers remain unchanged, how viewers become posters, how posters maintain the same status, and how posters turn into viewers. Understanding these processes will greatly provide web service management with more insights regarding a sustainable VC.

Third, this study categorized users by self-answering regarding their participation intention, and not by substantial evidence such as the pages viewed and count of posting representing the actual behavior of viewers and posters, respectively. When zero posting indicates a viewer, the count of posting represents the strength of posting behavior. Results of the study could provide further recommendations to practitioners and contributions to VC research. Fourth, system factors such as usefulness and ease of use from a technology acceptance model [Davis 1989] were not considered in this study. By measuring the actual count of posting and adding the system factors, the results can more positively ensure the effects of factors on the users' viewing or posting behaviors.

Fifth, as mentioned previously, initiation of offline activities and their impact on user intention to participate could be another research issue requiring extensive study. Offline interaction was significantly related to posting activity [Koh et al. 2007]. Based on social presence [Fulk et al. 1990] and social identify theories [Hogg and Terry 2000], the researchers suggested that in order to stimulate members' posting behavior, the community leader should plan and encourage offline activities, and link offline to online activities. This study has observed two websites in Taiwan for their offline activities. One used a campus beauty contest to attract users, mostly viewers, and its traffic flow increased dramatically. Another one employed a different way of initiating offline activities. In fact, the site's offline activities were activated by their members, not by the web operators. After monitoring these two websites for over one year, it appeared that operator-initiated offline activities had only a short-term effect while user-initiated offline activities had a long-term effect on the development of the VCs. However, effectively initiating offline activities remains an unresolved issue and further studies are required to provide a theoretical background.

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