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Abstract

As with organizational development, citizenship behavior should be central to the development and success of open professional virtual communities. An increasing literature emphasizes on predicting knowledge contribution behaviors in virtual communities (VC) from the extrinsic and intrinsic motivation or benefit perspectives. In line with the consumer behavior literature that distinguishes between hedonic and utilitarian shopping values, we classify these motivations or benefits of knowledge sharing into either hedonic or utilitarian. We propose and test a theoretical model in which hedonic value and utilitarian value are operationalized as formative second-order constructs and examine their effects on members' satisfaction with sharing knowledge and citizenship behaviors in an open professional VC. Data collected from 428 members of one VC provide support for the proposed model. The results help understanding how utilitarian value and hedonic value differ in their relationships with satisfaction and VCCB of knowledge contributors. Implications for theory and practice and limitations are discussed.

Keywords: Hedonic value, Utilitarian value, Open professional virtual community, Organizational citizenship behavior.

1. INTRODUCTION

An open professional virtual community (OPVC), which binds together a group of people who share common interests, goals, or practices and engage in social interactions through the Internet (Chiu et al. 2006), is an innovative way to create and share knowledge. In an online environment characterized by self-organization, weak-tie relationships, absence of a formal reward system, and technology-mediated communication, the performance of members' beneficial behaviors has been deemed critical to the effective and efficient functioning of open professional virtual communities (Kim et al. 2004; Yu and Chu 2007), and can be regarded as virtual community citizenship behavior (VCCB). Based on the literature that has validated the fundamental role of citizenship behavior and its potential constructive impact on organizational performance (e.g., Podsakoff and MacKenzie 1997), we propose that citizenship behavior should be central to the development and success of open professional virtual communities. A natural question then is: How can citizenship behaviors be promoted among community members when their interactions are mostly mediated by the Internet? With weak-tie relationships and under the condition that usually lacks extrinsic monetary rewards for knowledge contribution, stimulating individuals to participate and share knowledge in an OPVC is a difficult task (Chiu et al. 2006). Further, communication in a virtual community typically involves a large number of geographically distributed participants with different social backgrounds and perspectives and interacting without face-to-face cues. Then, the establishment of mutual understanding and the promotion of citizenship behaviors will be more difficult in such an environment than in physical organizations (Ma and Agarwal 2007).

In spite of these challenges, evidence suggests that individuals do engage in citizenship behaviors such as knowledge sharing (Yu and Chu 2007) and altruistic behavior (Wasko and Faraj 2000). This study aims to examine the role of the values derived from knowledge sharing in facilitating VCCB. Prior research indicates that there are numerous extrinsic motivations or benefits of knowledge sharing, ranging from enhancing reputation (Wasko and Faraj 2005), achieving mutual benefits (Kankanhalli et al. 2005; Wasko and Faraj 2005), to having career advancement (Hall 2001). Intrinsic motivations or benefits include achieving a sense of self-worth (Bock et al. 2005), obtaining enjoyment by helping others (Kankanhalli et al. 2005; Wasko and Faraj 2005), and having social affiliation (Bock et al. 2005; Chiu et al. 2006). In line with the consumer behavior literature that distinguishes between hedonic and utilitarian shopping values (e.g., Babin et al. 1994), we classify these motivations or benefits of knowledge sharing into either hedonic or utilitarian. We theorize that the key driver of citizenship behaviors in open professional virtual communities is perceived value — the benefits derived from the process and outcomes of knowledge sharing at the given cost of knowledge sharing (e.g., time and effort to codify knowledge). Perceived value has been shown to influence satisfaction, loyalty (patronage), and other important outcomes in the marketing literature (Jones et al. 2006). This study maintains that individuals' judgments of the hedonic and utilitarian values derived from knowledge sharing are related to VCCB both directly and indirectly through the mediation of satisfaction.

The role of value judgments is central to our theorizing. According to Vroom's (1964) expectancy theory, individuals have different sets of goals and will be motivated to perform certain acts if they conceive of a potential reward or outcome as valent. Thus, the values received from knowledge sharing in a virtual community should be related to the behaviors of its members, such as citizenship behaviors. Many organizational studies have investigated the antecedents of organizational citizenship behavior (OCB), including individual characteristics, task characteristics, organizational characteristics, and leadership characteristics (Podsakoff et al. 2000). There are also studies of the impacts of value for achievement (Neuman and Kickul 1998) and work value (Ryan 2002) on dimensions of OCB. However, very few studies have investigated the possible antecedents of VCCB comprehensively. One example is Yu and Chu's (2007) study that examined the effects of cohesiveness, affection similarity, and leader–member social exchange on OCB in online game communities. Nonetheless, they measured OCB with a one-factor (unidimensional) measure rather than a multi-dimensional latent construct approach. The different impacts of hedonic and utilitarian values derived from knowledge sharing on VCCB thus cannot be identified, leaving a knowledge gap unfilled. We propose and test a theoretical model in which hedonic value and utilitarian value are operationalized as formative second-order constructs and examine their effects on members' satisfaction with sharing knowledge and citizenship behaviors in an OPVC.

2. CONCEPTUAL FOUNDATION AND RESEARCH MODEL

2.1 Knowledge Contributions in Virtual Communities

Knowledge is the key to sustaining a virtual community. Knowledge contribution is of vital importance to a virtual community, enabling it to accumulate resources and to grow in the future. Accordingly, an increasing literature emphasizes on predicting knowledge contribution behaviors in virtual communities from the extrinsic and intrinsic motivation or benefit perspectives. For instance, research by Kankanhalli et al. (2005) examine and confirm the impact of both extrinsic benefits (e.g. reward, identification, and reciprocity) and intrinsic benefits (e.g. knowledge self-efficacy and enjoyment in helping others) on electronic knowledge repositories usage by knowledge contributors. In studies of electronic networks of practice, Wasko and Faraj (2000) consider challenge and fun derived from problem solving and enjoyment in helping others as intrinsic motivations for individuals to contribute knowledge.

In addition to knowledge contribution, other voluntary and beneficial behaviors are also critical for the success and development of a virtual community (Kim et al. 2004) such as helping others, provide positive word-of mouth to promote the community, and actively engaging in the community by

frequently joining the discussion and encouraging others to express opinions. Theses beneficial behaviors help develop a positive image of a community and sustain its longevity (McWilliam 2000) as well as benefit the entire community by enhancing its operational effectiveness. As these behaviors are voluntary acts in nature and are a matter of personal choice, they hence are synonymous with citizenship behaviors (i.e. OCB) (Organ 1988). As noted, existing empirical studies have verified that benefits (acting as motivators) play an important role underlying knowledge contribution in virtual communities. Currently, it remains unclear to what extent benefits are strong enough to stimulate members' beneficial behaviors to advance the community. Consequently, this study seeks to bridge the gap.

2.2 Dimensionality of OCB

Organ (1988) defined OCB as "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization" (p.4). Accordingly, we define virtual community citizenship behaviors (VCCB) as a member's beneficial behaviors that in the aggregate promote the effective functioning of the virtual community. Several taxonomies of OCB like behaviors have been proposed. Based on Organ (1988) and Van Dyne et al.'s (1994) taxonomies of OCB, we identified a five-dimensional VCCB framework, including (1) altruism (voluntary behaviors that help others with a work-related problem), (2) conscientiousness (discretionary actions beyond the minimum requirements of the organization), (3) civic virtue (responsible, constructive participation, and involvement in the political process of an organization), (4) loyalty (allegiance to and promotion of the organization), and (5) advocacy participation (behaviors targeted at other members of an organization to enhance individual performance).

Loyalty through positive word-of-mouth and advocacy participation through motivating other members enhance the effective operation and advancement of virtual communities (Kim et al., 2004), and thus they are included in our VCCB framework. Sportsmanship (willingness to tolerate the inevitable inconveniences without complaining) and courtesy (willingness to tolerate the inevitable inconveniences without complaining), two dimensions of Organ's (1988) OCB framework, are not included in our VCCB framework because they contribute less to the effective functioning and success of open professional virtual communities. Obedience (respect for rules and policies) and social participation (interpersonal and social contact with other organizational members), two dimensions of Van Dyne et al.'s (1994) OCB framework, overlaps with altruism, civic virtue, and conscientiousness of Organ's OCB framework (LePine et al. 2002), and thus considering them as VCCB dimensions will lead to construct muddiness. In addition, social participation is analogous to social interaction which is considered as a component of hedonic value, and functional participation (personally focused behaviors reflecting extra effort on the job, dedication to the job, and contribution to organizational effectiveness) in Van Dyne et al. (1994) overlaps with conscientiousness in Farh et al. (2001). Thus, both of them are excluded from our VCCB framework.

OCB is in its infancy of being explored in virtual community settings with few exceptions such as *online community voluntary behavior* (OCVB) by Kim et al. (2004), and OCB in the study of Yu and Chu (2007). A common theme underlying those recent studies applying OCB to virtual community is that they utilized either unidimensional (e.g. Yu and Chu 2007) or multi-dimensional (e.g. Kim et al. 2004) approach to measure OCB. The meta-analysis of LePine et al. (2002) on the nature and dimensionality of OCB reveals that most of the dimensions are highly interrelated. They suggest that when OCB is the focal construct of interest, OCB should be conceptualized as a latent construct. A more recent meta-analysis conducted by Hoffman et al. (2007) suggests that the latent construct approach allows for estimating the relationship between the communality among OCB dimensions (i.e., reflective model) and other variables, thus representing a more accurate estimation of the relationship between OCB and other variables. To the best of our knowledge, no studies on citizenship behaviors in virtual communities have utilized the second-order approach. To fill the gap, this study treats VCCB of knowledge contributors as a reflective second-order construct with five first-order dimensions and explores its antecedents and importance in an OPVC.

2.3 Antecedents of VCCB

Traditional literature on OCB has been conducted primarily within co-located organizations where there are strong-tie relationships among individuals and prescribed role requirements for individuals. Recent studies have applied diverse antecedents of OCB from organizational contexts to virtual communities and empirically investigated their predicting effects on VCCB-like behaviors (cf. Yu and Chu 2007; Kim et al. 2004). In sum, a common thread underlying their studies is that the majority of the antecedents of VCCB-like behaviors is mechanistically adopted from organizational literature without proper reconciliation (Grover et al., 2008) and may be determined by either convenience or a desire to retain their significant relationships with OCB here.

Strictly speaking, in virtual communities the voluntary and reciprocal nature of participation is not based on formal incentives and reward schemes, but on an implicit understanding of common interest and mutual values perceived by individuals from participating in the community (Ellis et al. 2004). "Value is the key to community life" (Wenger et al. 2002), even though perceived values may be different for each individual, and may not be immediately or directly provided by the community (Ellis et al. 2004). This suggests that additional attention should be given to perceived values as predictors of VCCB in virtual communities.

A considerable amount of research (e.g. Wasko and Faraj 2005; Bock et al. 2005; Kankanhalli et al. 2005) has documented the significant role of benefits in facilitating members' knowledge sharing in virtual communities. Additionally, Wenger et al. (2002) have implied the needs for members to be explicit about the values they derived from engagement to boost their voluntary participation to the community. However, scant attention has been paid to the impact of benefits on VCCB. Accordingly, this study complements that of recent VCCB studies by considering those critical benefits as components in forming the antecedents of VCCB, i.e. utilitarian and hedonic value.

2.3.1 Satisfaction

Researchers have empirically examined various organizational factors influencing, so organizational practices can be tailored to foster it, including job satisfaction (Fassina et al. 2008), perceived organizational support, and organizational commitment (Organ and Ryan 1995). Job satisfaction is among the most robust attitudinal predictor of OCB (Organ and Ryan 1995). When employees feel satisfied with their jobs, employees will display citizenship behaviors to reciprocate the support or benefit (e.g., positive work experiences) provided by their organization or colleagues (Bateman and Organ 1983).

In this study, satisfaction refers to a pleasurable or positive emotional state resulting from the appraisal of one's knowledge sharing experience in the virtual community. Satisfaction is an affective response known to be associated with intense states of arousal that lead to focused attention on specific targets and may therefore impact ongoing behavior. The satisfaction gained from connecting and interacting with other members within the virtual community enhances members' desire of participation (Dholakia et al. 2004). In addition, satisfied individuals are more likely to affectively and normatively commit to the relationship with others and engage in behaviors that will maintain a healthy relationship, such as providing help or accommodating others' needs. Ma and Agarwal (2007) show that an individual's satisfaction with the virtual community leads to loyalty and yields greater knowledge contribution.

H1: Individuals' satisfaction with the knowledge sharing experience is positively related to their VCCB.

2.3.2 Utilitarian and Hedonic Value

Perceived value has been defined as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml 1988, p. 14). In other words, perceived value is a trade-off between perceived benefits and perceived costs (sacrifices). Value is the outcome of evaluation process (Zeithaml 1988). Researchers view personal shopping value as the outcome of shopping experience (Babin et al. 1994). Shopping values are derived from both the extrinsic and intrinsic benefits provided by shopping activities (Babin et al. 1994). Accordingly, this

study considers perceived value from the benefit perspective and defines it as the perceived benefits of knowledge sharing experience.

Prior studies indicate that the values motivating consumers to engage in retail shopping include both utilitarian and hedonic dimensions (Babin et al. 1994). Research examining shopping motivations has long focused on the utilitarian aspects of shopping experience, which has been described as functional, task-related, and rational (Batra and Ahtola 1991). Utilitarian value reflects the conscious pursuit of the expected consequences (Babin et al. 1994) and concern with whether or not a product acquisition related mission is accomplished (Batra and Ahtola 1991). Because traditional, utilitarian product acquisition explanations may not fully reflect the totality of shopping experience, researchers has further suggested the importance of hedonic value of shopping (Babin et al. 1994). Hedonic consumption designates "those facets of consumer behavior that relate to the multisensory, fantasy and emotive aspects of one's experience of products" (Hirschman and Holbrook 1982, p. 92). Following the consumer behavior literature that distinguishes between hedonic and utilitarian shopping values, we classify the values deriving from knowledge sharing into either hedonic or utilitarian.

Satisfaction judgments are formed by evaluating the outcomes of behavior (e.g., product/service usage) and cognitive interpretation and related process (e.g., expectancy-disconfirmation) (Oliver 1993). Disconfirmation is the degree to which performance exceeds, equals, or falls short of an individual's expectations, resulting in positive, zero, and negative disconfirmation, respectively (Oliver and Swan 1989). Cadotte et al. (1987) defines perceived performance as customers' perception of how product performance fulfills their needs, wants, and desires. According to Cadotte et al.'s (1987) definition, the intrinsic (e.g., playfulness) and extrinsic (reputation) benefits of knowledge sharing behavior are individuals' perception of how knowledge sharing fulfills their needs, wants, and desires, and thus can be considered as perceived performance or outcomes of knowledge sharing. Therefore, utilitarian and hedonic values of knowledge sharing have impacts on individuals' satisfaction with the knowledge sharing experience.

According to social exchange theory (Blau 1984), voluntary actions of individuals are motivated by the returns they are expected to bring and typically do in fact bring from others. Equity theory (Adams 1965), an extension of social exchange theory, theorizes that individuals seek a fair balance between input (favors given) and output (favors received) and become satisfied and motivated whenever they feel their inputs are being fairly rewarded. Therefore, we posit that a knowledge contributor become satisfied and motivated to perform more voluntary actions when they receive expected values from other members of the virtual community or the knowledge sharing experience itself. Prior research has shown that utilitarian and hedonic values have positive effects on customer satisfaction and loyalty (Jones et al. 2006). Organizational studies (Muse et al. 2008) also show that perceived usefulness or value of work-life benefits is positively related to OCB.

Utilitarian value and hedonic value are proposed as formative second-order constructs. The rationale for the proposed formative constructs is twofold. First, any of the underlying dimensions of utilitarian and hedonic value can singlehandedly or in some combination cause the perception of utilitarian and hedonic value. Second, the underlying dimensions of the utilitarian and hedonic value are not highly correlated. Therefore, a formative model is proposed to accurately and parsimoniously capture the multidimensional nature of utilitarian and hedonic value. In this study, utilitarian value refers to the functional, instrumental, and practical values derived from the knowledge sharing experience. Utilitarian value derived from knowledge sharing includes reputation, reciprocity, career advancement, and reflective learning. Unlike most OCB studies that focus on the exchange between employees and employers, individuals' voluntary behavior in virtual communities and satisfaction with the knowledge sharing experience is due to the receipt of both extrinsic benefits as well as intrinsic benefits derived from the knowledge sharing experience itself and an exchange or interaction between members.

Utilitarian Value

Individuals forgo ownership or power of knowledge with the expectations of realizing their interests and gaining utility via social exchange (Coleman 1994).

• One possible utility that an individual can receive from knowledge sharing is the perception that knowledge sharing enhances his/her reputation in the virtual community (Wasko and Faraj 2005). According to Lerner and Tirole's (2002) explanation of motivations of open source programmers, reputation is driver of voluntary efforts in community setting. As emphasized by research on prosocial behavior in virtual environment, individuals help others not only for reputation (Wasko and Faraj 2005) but also for future reciprocation.

• Reciprocity refers to the expectations that the individual's efforts in the virtual community will be fairly reciprocated (Wasko and Faraj 2005). According to social exchange theory (Blau 1964) and norm of reciprocity (Gouldner 1960), positive beneficial actions directed at individuals by other parties create an impetus for individuals to reciprocate in positive ways through their attitude and/or behavior. That is, reciprocity implies that a knowledge contributor who receives help or knowledge from other members in the virtual community as the return to his favors given will be satisfied with the knowledge sharing experience and engage in VCCB.

• Career advancement refers to degree to which an individual believes sharing his knowledge will positively affect his career in the future (Sharrat and Usoro 2003). In a survey examining why people participate and share knowledge in electronic communities of practice, some participants indicate that the community is an important resource to enhance standing in the profession, to establish a reputation that will hopefully translate into a job, or even to generate clients for consulting business (Wasko and Faraj 2000). Career advancement is indeed an effective incentive in motivating knowledge sharing (Hall 2001).

• Boyd and Fales (1983) described reflective learning as "the process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective" (p.100). Such a process not only improves critical thinking skills but also contributes to the development of new knowledge (Boyd and Fales 1983). We theorize that those individuals able to develop a new perspective or have better understanding of the discussed topics or issues through a reflective process are more likely to be satisfied with the knowledge sharing experience and have an increased desire to share knowledge, and also to develop the tendency to perform citizenship behaviors.

H2: Utilitarian value is positively related with VCCB.

H3: Utilitarian value is positively related with individuals' satisfaction with the knowledge sharing experience.

Hedonic Value

In this study, hedonic value reflects the multisensory, fantasy, emotive, and enjoyment-related values derived from the knowledge sharing experience. Hedonic value derived from knowledge sharing includes playfulness, social interaction, self-worth, challenge, and community attachment.

Playfulness refers to the extent to which sharing knowledge is perceived to be personally enjoyable and fun. Individuals are self-determining and intrinsically motivated in knowledge sharing when they are interested in it or enjoy doing it (Deci and Ryan 1985). Prior research indicates that individuals participate in online communities and help others because helping others is enjoyable and brings satisfaction (Wasko and Faraj 2000). Gagné and Deci (2005) argued that employees' interests in activities (i.e., intrinsic motivation) yield job satisfaction and OCBs.

Social interaction refers to the extent to which knowledge sharing leads to online interactions and relationships between an individual and other members. Bock et al. (2005) argued that individuals who believe their mutual relationships with other members in virtual communities can be improved through their knowledge sharing are likely to have positive feeling toward knowledge sharing. Bowler and Brass (2006) show that social network ties between employees (e.g. strength of friendship) are positively related to performance of interpersonal citizenship behavior.

Self-worth refers to the sense of one's own value an individual gets by sharing knowledge with other members. Korman (1970) hypothesized that "all other things being equal, individuals will engage in and find satisfying those behavioral roles which maximize their sense of cognitive balance or consistency" (p. 32). As a self-concept based motivational theory, self-perceived value (e.g., self-esteem) has been found to be related to citizenship behavior (Van Dyne et al. 2000).

Challenge refers to the opportunity to share knowledge in a way that allows individuals to stretch their abilities just a little further than they had before (Csikszentmihalyi 1990). Individuals are moved to act for fun and challenge when intrinsically motivated (Ryan and Deci 2000). According to Csikszentmihalyi's (1990) flow theory, when the knowledge sharing activity appropriately challenges knowledge contributors so that they have flow experience, which leads to satisfaction and motivation to continue sharing knowledge.

Community attachment refers to an individual's affective or emotional bond with other members and the virtual community itself (Theodori 2000). Wellman and Gulia (1999) argue that individuals having a strong attachment to an electronic group will be more likely to participate and provide assistance to others. Ryan et al. (2005) found that community attachment positively affected voluntary participation in a rural community. In a meta-analysis, Meyer et al. (2002) found that affective or emotional attachment to the organization was strongly related to positive work-related behaviors (e.g., OCB).

H4: Hedonic value is positively related with VCCB.

H5: Hedonic value is positively related with individuals' satisfaction with the knowledge sharing experience.

3. RESEARCH METHODOLOGY

3.1. Measurement Development

All measures of the study were adapted from existing measures. A pre-test was conducted involving twenty experts and senior members with knowledge sharing experience in diverse IT professional virtual communities to assess its logical consistencies, ease of understanding, and contextual relevance. Then, a pilot study with 158 knowledge contributors of the target open professional virtual community was also conducted to assess the reliability and validity of the instrument.

3.2. Survey Administration

The research model was tested with data collected from the members of a professional virtual community called Programmer Club. A banner with a hyperlink connecting to our Web survey was posted on the homepage of the Programmer Club and members with knowledge sharing experience were cordially invited to support this survey. The Web survey yielded a total of 428 complete and valid responses for data analysis. Table 1 lists the demographic information of the respondents.

3.3. Data Analysis

Data analysis utilized a two-step approach as recommended by Anderson and Gerbing (1988), including the analysis of the measurement model and testing the structural relationships among latent constructs. PLS (partial least squares,) was used to assess both the measurement model and the structural model because it allows latent constructs to be modeled as formative or reflective indicators as was the case with our model. PLS places minimal restrictions on measurement scales, sample size, and residual distribution (Chin and Newsted 1999).

Measure	Items	Freq.	Percent	Measure	Items	Freq.	Percent
Gender	Male	364	85.0	Gender	Female	64	15.0
Age	< 20	9	2.1	Education	High school	13	3.0
	20-24	76	17.8		College	55	12.9
	25-29	131	30.6		University	126	29.4
	30 ~	212	49.5		Graduate school	234	54.7
Member History (in years)	< 1	101	23.6	Usage of the virtual community per week (in hours)	< 1	142	33.2
	1-2	93	21.7		1-2	189	44.1
	2-3	89	20.8		3-5	67	15.7
	3-4	61	14.3		6-10	20	4.7
	4 ~	84	19.6		11 ~	10	2.3

Table 1.   Demographic Information of Respondents (N = 428)

3.3.1 Measurement Model

Second order constructs were approximated using the approach of repeated indicators suggested by Chin et al. (2003). The adequacy of the measurement model was evaluated on the criteria of reliability,

and convergent and discriminant validity. Reliability was examined using the composite reliability values. Table 2 shows that all the values were above 0.7, satisfying the commonly acceptable level. The convergent validity of the scales was assessed by two criteria (Fornell and Larcker, 1981): (1) all indicator loadings should be significant and exceed 0.7 and (2) average variance extracted (AVE) by each construct should exceed the variance due to measurement error for that construct (i.e., AVE should exceed 0.50). All items exhibited a loading higher than 0.7 on their respective construct, and all the AVEs ranged from 0.75 to 0.89, thus satisfying both the conditions for convergent validity.

Discriminant validity was assessed by two criteria. First, the loading of each measurement item on its assigned construct is larger than its loadings on any other constructs will be consider as having good discriminant validity (Chin 1998). Second, the square root of the AVE of a construct should be greater than the correlations between the construct and other constructs in the model (Fornell and Larcker 1981). Both criteria are met, demonstrating sufficient construct validity of the scales.

Constructs	Items	Composite Reliability	Mean (STD)	AVE
Reputation (RP)	3	0.90	5.07 (1.14)	0.75
Reciprocity (RC)	3	0.92	5.57 (1.00)	0.79
Career Advancement (CD)	3	0.94	4.88 (1.25)	0.83
Reflective Learning (RL)	3	0.95	5.60 (0.89)	0.87
Playfulness (PL)	3	0.95	5.97 (0.93)	0.87
Social Interaction (SI)	3	0.93	5.10 (1.16)	0.82
Self-Worth (SW)	3	0.96	5.64 (0.98)	0.88
Challenge (CH)	3	0.94	5.56 (1.05)	0.83
Community Attachment (CT)	3	0.93	5.09 (1.17)	0.82
Satisfaction (SA)	4	0.96	5.54 (0.98)	0.84
Altruism (AL)	3	0.92	5.70 (0.93)	0.80
Civic Virtue (CV)	3	0.94	4.84 (1.15)	0.85
Conscientiousness (CO)	3	0.91	4.95 (1.16)	0.78
Loyalty (LO)	3	0.96	5.19 (1.09)	0.89
Advocacy Participation (AP)	3	0.96	5.13 (1.09)	0.88

Table 2.   Descriptive Statistics of constructs

3.3.2 Structural Model
In PLS analysis, examining the structural paths and the R-square scores of endogenous variables assesses the explanatory power of a structural model. Figure 1 shows the results of structural path analysis. All paths exhibited a P-value less than 0.05. The significance of all paths was assessed with 500 bootstrap runs. All the standardized path coefficients that are statistically significant exceed 0.2, which is the suggested minimum standard by Chin (1998) for paths to be considered meaningful. Overall, the high degree of explained variance by the model in terms of R^2 is 62% for satisfaction and 71% for VCCB (Figure 1).

4. DISCUSSION AND IMPLICATIONS
This paper aims to shed light on the phenomenon of knowledge contributors' citizenship behaviors in open professional virtual communities. By operationalizing utilitarian and hedonic value as formative second-order constructs, this study contributes to our enhanced understanding of the over-arching effects of their underlying dimensions on knowledge contributors' satisfaction with knowledge sharing experience and VCCB. Overall, the study helps us gain a better understanding of how utilitarian value and hedonic value differ in their relationships with satisfaction and VCCB of

knowledge contributors.

4.1 Summary of Results

Overall, the results provide full support for the expected relationships among utilitarian value, hedonic value, satisfaction, and VCCB. The findings indicate that knowledge sharing invokes multiple value
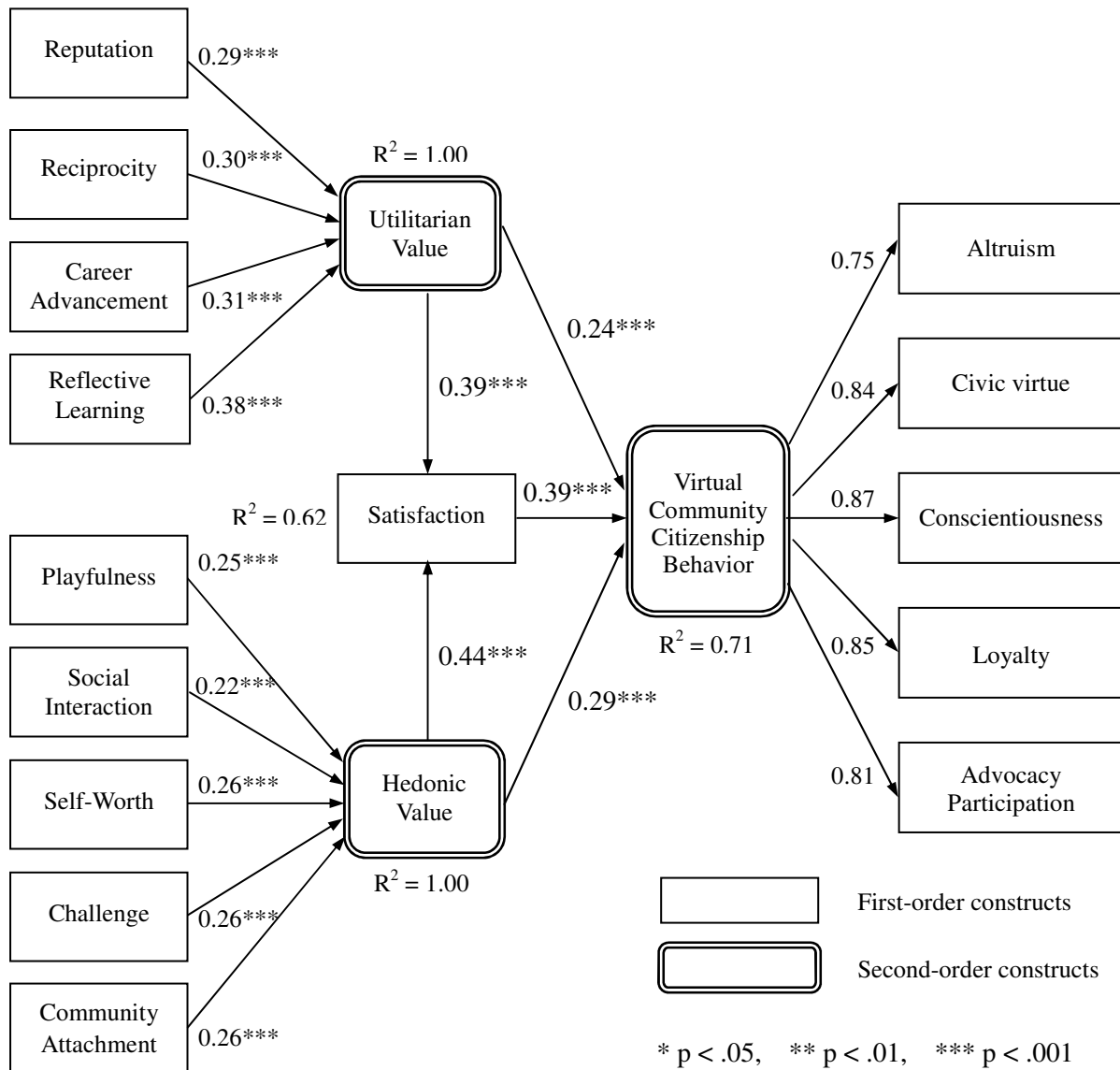

Figure1.   *Research model and its analysis results*

dimensions and that these value dimensions additively contribute to knowledge contributors' satisfaction with knowledge sharing experience and VCCB. Results supported hypotheses based on social exchange theory and equity theory. Knowledge sharing can be viewed as a citizenship behavior in open professional virtual communities. Although individuals' knowledge sharing behaviors are not directly rewarded by the virtual community, utilitarian and hedonic value received from knowledge sharing experience are strong enough to stimulate them to perform other behaviors that are beneficial to other members and the virtual community, i.e., citizenship behaviors. The measurement model verified two overall value dimensions (utilitarian and hedonic) in the OPVC environment, and more importantly, these value dimensions were operationalized at the benefit level rather than at the attribute level. The study found that knowledge contributors indeed perceived utilitarian and hedonic value to be important in their satisfaction with knowledge sharing experience and VCCB, though hedonic value was a stronger predictor than utilitarian value.

Consistent with prior research in management (Podsakoff et al. 2000), satisfaction is a strong attitudinal predictor of VCCB, with a path coefficient of 0.39. It suggests that individuals experience positive emotional states, or happy with their knowledge sharing experience, are likely to engage in other behaviors beneficial to other members and the virtual community except for knowledge sharing. The results also indicate that satisfaction plays a role of mediator on the relationships between utilitarian and hedonic value and VCCB. The finding is as expected that enhanced satisfaction ensuing from the utilitarian and hedonic value of knowledge sharing may in turn stimulate knowledge contributors to engage in citizenship behaviors out of a desire to reciprocate the feeling of satisfaction that they experience. Furthermore, the implication of this finding is that IS scholars have to focus attention on both the evaluative forces (hedonic and utilitarian value) and the relational forces (satisfaction) that drive citizenship behaviors.

This study shows that utilitarian value is a multifaceted construct consisting of four components or underlying dimensions: reputation, reciprocity, career advancement, and reflective learning. Reflective learning is the dominant utilitarian component, whereas the other three components are significant utilitarian benefits with nearly equal importance. Our findings suggest that developing a new perspective or have a better understanding of the discussed topics or issues through self-directed and reflective learning during the knowledge sharing process is a more important driver for knowledge contributors to engage in VCCB than receiving knowledge from other members when he or she is in need (reciprocity). Prior research indicates that the gained reputation capital extends one's profession (Stewart 2003) and ultimately is a means of enhancing a knowledge contributor's position in the job market (Lerner and Tirole 2002). Those authors' arguments help explain the finding that reputation and career advancement have nearly equal importance in forming utilitarian value.

Playfulness, self worth, challenge, and community attachment are the primary components in forming hedonic value, with weight ranging from 0.25 to 0.26, and social interaction is the next one (weight = 0.22). The results are consistent with Gupta and Kim's findings that building relationships with other members is not the prime motivator for members to participate in the virtual community. The impacts of challenge and community attachment on members' beneficial behaviors (e.g. knowledge sharing) has not received much attention in the professional virtual community literature. The results suggest that it is possible that members' participation is primarily for stretching their professional abilities and having their own online universe, and thus the pleasure deriving from performing optimally challenging tasks (e.g., knowledge sharing) and the felling of happiness when staying in the virtual community (i.e., community attachment) is stronger in stimulating VCCB than building relationships with other members (social interaction).

4.2 Implications for Theory
Altruism, civic virtue, conscientiousness, loyalty, and advocacy participation serve as manifest indicators of VCCB. This study reinforces previous findings on OCB that measures of the dimensions of citizenship behaviors are best viewed reflective indicators of a general citizenship behaviors factor. In addition, the mean values of the five dimensions of VCCB range from 4.84 to 5.70, suggesting that knowledge contributors do engage in citizenship behaviors in open professional virtual communities. Our findings imply that individuals perform knowledge sharing is likely to perform other beneficial behaviors (i.e., altruism, civic virtue, conscientiousness, loyalty, and advocacy participation) due to the values derived from the beneficial behavior.

From a descriptive standpoint, utilitarian and hedonic values represent additional key determinants of citizenship behaviors in open professional virtual communities that have been ignored in the literature. The integration of the underlying dimensions of utilitarian and hedonic value also results in a more descriptive model that better explain knowledge contributors' satisfaction and VCCB. In addition, the path coefficients ($\beta = 0.24$ and $\beta = 0.29$, respectively) implies that utilitarian and hedonic value are possibly among the most important sources of knowledge contributors' VCCB. The study extends the citizenship behavior literature from employee-organization relationships to member-virtual community relationships, helping to advance explanations about the potential of the underlying dimensions of utilitarian and hedonic value as triggers of VCCB. Our findings suggest that for online

organizations characterized with no formal wage and reward system, weak-tie relationships, technology-mediated communication, and no formally prescribed role requirements, values self-derived by individuals during performing beneficial behaviors and not directly provided by the online organizations are strong enough to stimulate individuals' citizenship behaviors.

Previous research (e.g., Bock et al. 2005; Kankanhalli et al. 2005; Wasko and Faraj 2005) has discussed the various benefits of knowledge sharing, but examined their individual effects on knowledge sharing behavior instead of the integrative effects. This study demonstrated the appropriateness of modeling utilitarian and hedonic value as formative second-order constructs. By modeling them as second-order constructs, we built a parsimonious model to examine the over-arching effects of their underlying dimensions on knowledge contributors' satisfaction and VCCB.

4.3 Implications for Practice

Managers or hosts of virtual communities invest valuable time, effort, and resources in developing the platform of knowledge sharing, and thus would expect its long-term survival and success. Although knowledge sharing plays a critical role in the effective functioning of open professional virtual communities, this study suggests that managers or hosts of such communities should pay attention to broadly-defined beneficial behaviors, i.e., citizenship behaviors. Prior research addresses issues surrounding knowledge sharing in virtual communities from two major perspectives: social-psychological (e.g., Wasko and Faraj 2005) and IT-based (e.g., Ma and Agarwal 2007). Studies from these two perspectives have shown that extrinsic and intrinsic benefits and IT-based features are associated with online knowledge sharing. Although some components of the utilitarian and hedonic value are not directly provided by the virtual communities, this study suggest that managers or hosts can still use IT-based features to create or enhance utilitarian and hedonic value, which in turn will stimulate member citizenship behaviors.

Our findings suggest that playfulness is a stronger component in forming hedonic value than social interaction. From the perspective of a manager or host, the appropriate interpretation is that given the situational context of our sample, further increases in social interaction may be less potent than similar increases in playfulness of knowledge sharing. Developers and designers of virtual communities can create a more enjoyable knowledge sharing environment in different ways. First, they can incorporate innovative multimedia tools and techniques (e.g., video conferencing) to make the knowledge sharing process and the interaction between members more interesting and entertaining. Second, hosts or managers should develop strategies to promote interesting discussions. Finally, they should develop strategies to encourage interacting among members and forming relationships among members, which will enhance the playfulness of knowledge sharing in their virtual communities (Gupta and Kim 2007).

Creating and maintaining a set of core and experienced knowledge contributors plays an important role in developing and sustaining an OPVC (Wasko and Faraj 2005). Enhancing these core knowledge contributors' reputation, raising their sense of self-worth, and providing help to their career are the possible approaches. Many virtual communities use a reputation or ranking system to help individuals form their expert identity in particular areas. Forming expert identity by allowing members to submit video clips to introduce themselves and by generating profiles automatically from their past activities (Ma and Agarwal 2007) is also helpful to knowledge contributors' career advancement. Managers of the virtual communities can post information about job opportunities and outsourcing cases on the homepage and help top and well-recognized knowledge contributors get those job opportunities and outsourcing cases. This in turn leads to top knowledge contributors' satisfaction with their knowledge sharing experience and identification with the community and motivate them to continue to engage in citizenship behaviors. Inviting top knowledge contributors to serve as hosts is also one of the approaches to enhancing their sense of self-worth and also members' respect to them.

Managers of virtual communities can encourage reciprocity by using extrinsic motivators such as rewards for sharing knowledge. For example, some virtual communities provide a mechanism that

knowledge receivers can donate value-added points (VP) to knowledge contributors as a return of favors. Earning VP by contributing knowledge can be considered as an approach to forcing an individual to reciprocate the benefits he or she received from others, and thus can be viewed as an enforcement of social norms. The VP may represent knowledge contributors' status and reputation within the community and can also be changed into monetary rewards or exchanged gifts from the virtual community. When a member ran out of VP, he or she could buy VP from the community or contribute knowledge to earn VP.

The importance of reflective learning, and challenge has been largely ignored in prior virtual community research. The strong weights of reflective learning and challenge suggest that individuals not only participate in virtual communities to help other members by sharing knowledge but also expect to advance their own knowledge through reflective thinking and stretch their abilities. There are tools or approaches available to learning facilitator, including digital storytelling, reflective metaphors, reflective journals, e-portfolios, and reflective dialogue. Managers of virtual communities should develop strategies and provide tools that give knowledge contributors the opportunity to clarify and reflect their thinking, then to achieve deep learning and to rate the difficulty and the expertise level needed to respond to the posted questions. Members can use the expertise level information provided by the reputation and ranking system to check whether the difficulty level of the posted questions can appropriately challenges their expertise levels.

4.4 Limitations
We note that our findings have several limitations. First, whether our findings could be generalized to all types of professional virtual communities is unclear. Citizenship behaviors in open professional virtual communities might be different from that of professional virtual communities residing inside organizations and communities focusing on hobbies. Further research is needed to examine the generalizability of our findings. Second, the results may have been impacted by selection bias, since our sample comprises only current knowledge contributors. Individuals who already left the virtual community might have different perceptions about the influence of the various dimensions of utilitarian and hedonic value. Therefore, the results should be interpreted as only explaining VCCB of current knowledge contributors of virtual communities. Finally, as the data are cross-sectional, all the statistically supported relationships can only be viewed as tentative.

4.5 Future Research
The results should be interpreted as only explaining VCCB of all respondents. This study did not differentiate the motivational drivers of active knowledge contributors' (i.e., core or frequent contributors) VCCB from those of less active contributors (i.e., casual or infrequent contributors). Creation and maintenance of a set of core, centralized individuals with experience in the practice is critical to the development and sustainability of open professional virtual communities (Wasko and Faraj 2005). Therefore, an interesting area for future research is to examine motivational drivers of VCCB from the perspective of active knowledge contributors.

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The questionnaire is available from the authors upon request.