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ABSTRACT

This study aims at investigating users' purposes for social virtual worlds which are thriving and emerging social cyberspaces; and introducing an alternative method (i.e., a means-end approach) to analyze users' purposes. The data from a web-based questionnaire were analyzed by a means-end approach (Olson and Reynolds, 1983) which produces users' purpose structure consisting of individual purposes and their hierarchical relations. The results showed that people come to social virtual worlds for satisfying their social and hedonic needs and for escaping from real world constraints as do virtual community members and gaming virtual world players; they also pursue unique activities, such as creating virtual objects and selling them. On the other hand, by clarifying relations among purposes, the mean-ends approach provided a richer explanation about users' purposes than prior research which just offers separate purposes of social cyberspace users.

Keywords

Virtual worlds, social virtual worlds, means-end analysis, users' purpose.

INTRODUCTION

Recently a new type of virtual worlds (VWs) stressing social interactions and users' empowerment has appeared, namely social virtual worlds (SVWs) (e.g., *Second Life*, *There.com*). Massive multiplayer online games (MMOGs) or gaming virtual worlds (GVWs), such as *World of Warcraft*, are characterized by a pre-defined structure and quest-driven behaviors, whereas SVWs have emergent structures which are created by users under minimum constraints (Juul, 2005). SVWs offer their users an opportunity to determine their experiences in the worlds for themselves (Dreyfus, 2008), and this autonomy makes the worlds places filled with diverse activities such as socialization, learning, virtual business sprout, entertainment, and so on. The increased number of users reflects popularity of SVWs: for instance, *Second Life*, one of popular SVWs, announced that its subscribers exceeded 10 millions as of the end of 2007 (Secondlife.com, 2008). The amount of real-money trading in SVWs has also exponentially been increasing: for example, user-to-user transactions were estimated 1.2 million dollars per day in *Second Life* in early 2007 (Gardiner, 2007). In addition to quantitative growth of SVWs, their potential as a marketing channel and a collaboration tool has attracted the attentions of managers and researchers. Also, regarding SVWs as a future platform for e-learning, many educational organizations have been increasingly using SVWs.

Despite renowned interest in SVWs, there is currently little empirical research on SVWs, particularly on users' perceptions and behaviors in SVWs. SVWs' distinctive characteristics may cause users to access and behave in such environments differently than in other cyberspaces, such as text-based virtual communities and even GVWs. The initial step to study SVW users may be a question of 'why do people come to SVWs?'; that is, users' purpose for logging in SVWs. Knowledge of these purposes would benefit businesses that are considering the strategic use of SVWs, as well as SVW operators in terms of attracting and retaining more users, and also the researchers that are begging to investigate the nature of SVW users.

This study employed a means-end approach, which is considered an effective method for eliciting people's purpose structure (i.e., purposes and their relations) when they approach an object or an event (Olson and Reynolds, 1983). Prior studies, which investigate users' purposes for virtual communities (Ridings and Gefen, 2004) and GVWs (Bartle, 2003; Yee, 2006), produce sets of separate individual users' purposes but offered little explanation about the relations among them. Studies of relations among purposes, or a purpose structure, can provide more information about users' goal-oriented Behavior than those of isolated purpose (Pieters et al., 1995). Because it can clarify goal structure, a means-end analysis is expected to offer richer

information about users' purposes for SVWs. This study thus contributes to research on cyberspace users, in terms of offering a methodological novelty, and demonstrates an empirical study of an emerging cyberspace.

THEORETICAL BACKGROUND

Users' Purposes for Social Cyberspace

Users' purposes for SVWs may be analogous to motivations for joining virtual communities (VCs) and playing GVWs. VCs are cyberspaces in which people communicate and form networks of personal relationships (Rheingold, 1993). SVWs that support 3D interfaces and real-time avatar interactions can be differentiated from conventional VCs that depend on asynchronous text-based interactions. Nevertheless, because of the *social* nature, SVWs are usually considered an extension of VCs. Prior studies note that *information exchange*, *social relations*, *psychological support*, and *entertainment* are common goals for joining VCs (Bressler and Grantham, 2000; Hagel and Armstrong, 1997; Wellman et al., 1996). Bartle (2003) classifies GVW users into four types according to their goals: *socializers*, *explorers*, *achievers*, and *controllers*. Socializers attempt to form groups and complete shared objectives; explorers seek new places in a GVW; achievers pursue the gradual accumulation of wealth and reputation in GVWs; and controllers want to compete with and defeat others. Yee (2006) empirically examined Bartle's GVW user typology through an exploratory factor analysis, and proposes a new framework that consists of three overarching goals: *achievement*, *socializing*, and *immersion*. Each overarching purpose is composed of sub-motivations. Achievement includes advancement, mechanics, and competition; socializing includes relationships and teamwork; and immersion includes discovery, role-playing, customization, and escapism.

All prior studies which investigate users' purposes in living in cyberspaces provide sets of separate purposes without addressing the relations among those purposes. Although the prior studies recognize that purposes do not suppress each other (i.e., a user may have multiple purposes) (Bartle, 2003; Yee, 2006), they overlook how purposes are connected. As a result, the prior studies provide just a set of fragmented purposes in using cyberspaces. In order to compensate the weakness, this study employs a means-end analysis which shows a purpose structure which consists of purposes and their relationships.

Means-End Analysis

A means-end analysis posits that product or service attributes represent the means by which consumers achieve benefits and important personal values (i.e., ends) (Gutman, 1982; Olson and Reynolds, 1983). In other words, a means-end analysis is an approach for discovering the important meanings that consumers ascribe to a product or service's attributes (Voss et al., 2007). The analysis assumes that consumer knowledge is hierarchically organized by levels of abstraction (Reynolds et al., 1995), and focuses on a product or service's meanings at three levels of abstraction: *attributions*, *consequences*, and *values*. Attributes refer to a product or service's physical or observable properties: consequences are the benefits attained by the attributes; and values imply highly abstract motivation that guides usage behavior (Klenosky, 2002). An attribute-consequence-value chain is usually expressed by a hierarchical map, which consists of nodes (i.e., attributes, consequences, and values) and relationships among them.

A means-end analysis typically depends on a laddering interview technique. Even though means-end chain studies that employ a laddering interview technique usually use the traditional way as stated above, some studies employ a modified laddering technique. The main modification appears to be a way to decide the level of abstraction and a technique for data collection. Employing network theory (see Scott, 1991), some studies calculate the abstractness of each element (concept) and use it to determine the position of the element in a hierarchical map instead of a strict specification of three levels of abstraction (i.e., attributes, consequences, and values) (Bagozzi and Dabholkar, 1994; Pieters et al., 1995; Capozza et al., 2003). This revised method allows researchers to know the relationships of elements without having to conduct additional work to classify elements into three levels. One critique of the laddering technique is that an answer frequently does not correspond to the question (e.g., a consequence or value answer to the attribute question). Studies that employ network theory reduce this limitation because each element has a level according to its abstractness without any label (e.g., attribute) in the revised method. On the other hand, instead of in-depth interviews, some studies use questionnaires: a technique developed by Walker and Olsen (1991) (e.g., Botschen and Hemetsberer, 1998; Pieters et al., 1995; Voss et al., 2007). The advantage of a questionnaire version is that respondents themselves decide when they finish the laddering process, which may make respondents feel pressure (Botschen and Hemetsberer, 1998). In addition, compared to the in-depth interviews, a questionnaire version is a cost-effective method for data collection (Botschen et al., 1999).

METHODOLOGY

Data Gathering

The target SVW for this study was *There* (www.there.com), which is a SVW equipped with a 3D environment. The reason why we chose *There* was that it is closer to our definition of SVWs in terms of users' autonomy (i.e., diverse user activities including creating and selling virtual objects), and it has recently grown rapidly in terms of the number of registered members. The number of its members is over one million as of early 2008. In *There*, a member has a personal avatar that represents oneself. A member can manipulate his or her personal avatar's face, hair, and body and put it into clothes. Also, a member can create 3D objects (e.g., chair, building, waterfall) using developer program, and perform virtual tasks with them or sell them to other members. Controlling their personal avatars, members enjoy synchronous chatting at the park or on the beach, dancing at night club, or taking a buggy in *There*. Fifty-four Thereians, which *There* users call themselves, responded to our web-based survey or a questionnaire-based laddering technique. During two weeks, we recruited Thereians to participate in the web-based survey by randomly sending solicitation messages (i.e., *There* messenger) that included the web-survey address. Participation in this study was voluntary. The respondents were heterogeneous in demographics.

		Frequency	Percent
Age	18-24	10	18.6
	25-34	6	11.1
	35-44	13	24.1
	45-54	11	20.4
	55 or older	3	5.5
	No answer	11	20.4
Gender	Male	21	38.9
	Female	22	40.7
	No answer	11	20.4
Education	High school	11	20.4
	Community college	9	16.7
	Undergraduate	7	13.0
	Graduate	15	27.8
	No answer	12	22.2
Tenure	Less than 6 months	7	13.0
	6 months to 1 year	6	11.1
	1 year to 2 years	11	20.4
	Longer than 2 years	19	35.2
	No answer	11	20.4

Table 1. Demographics of Participants

A questionnaire consisted of three questions for a laddering analysis and five questions about demographic information. Based on prior laddering interview technique, we made three open questions probing purposes to use *There*: (1) we first placed the overarching question (What are your main three purposes for using *There*?); (2) then asked the downward question (What characteristics of *There* help you achieve each purpose?); (3) and finally asked the upward question (Why is each purpose important to you?). In our procedure, the overarching question corresponds to the consequence question of a traditional laddering technique; the downward question corresponds to the attribute question; and the upward question corresponds to the value question. As previously stating, because our focus is on the relationships of elements rather than to classification of them into attributes, consequences, and values, we used our own terms rather than those three labels. Also, based on our pilot study, we ordered three questions. In the pilot study, the most of our respondents answered their consequences or values instead of attributes to the attribute question (the downward question in our study). In this situation, we had difficulty continuing to probe because they already answer their highly abstractive purposes. For example, when we asked the attribute question (i.e., what characteristic makes There attractive to you?), many respondents answered just fun or meeting new people which corresponded to consequences or values rather than attributes. Thus, we had to ask again the attribute question (i.e., what characteristic of There help you achieve this purpose?). In order to conduct more effective web survey-based laddering procedure, we needed to modify a laddering procedure, and placed the overarching question at first.

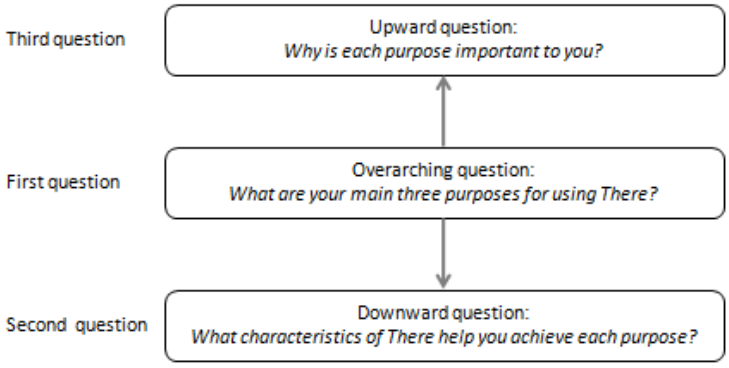

Figure 1. Laddering Interview Procedure

RESULTS AND ANALYSIS

Coding

For analysis, the responses from three probing questions were coded. One of the authors coded the data using an open coding procedure in which codes were not predetermined but rather emerged from the data. This resulted in 45 detailed codes present in the data. In cases where the data contained more than one topic, multiple codes were assigned. For example, "Thereians want to be sociable and have fun" was assigned two codes – *Social relations* and *Fun*. A second coder, the other author, independently re-coded the data using the set of codes identified by the first coder. The two raters were in agreement on 292 of the 363 codes assigned (Cohen's Kappa = 0.78), indicating an acceptable level of inter-rater reliability (Fleiss 1981). Inter-rater disagreements were then reconciled through discussion. Finally, associated codes were grouped into 11 topics, as shown in Table 2. This categorization was also verified by the same procedure as the detailed coding procedure (Cohen's Kappa = 0.91).

Generating a Purpose Structure

Responses to the three questions (the overarching question, the downward question, and the upward question) generated a means-end chain, or a ladder of meanings; that is, answers to the downward question pertain to a means for answers to the overarching question, and likewise answers to the overarching question correspond to a means for answers to the upward question. For example, if a subject responds *Technical features* to the downward question; *Social relations* to the overarching question; and *Amusement* to the upward question, two direct linkages are created: *Technical features* → *Social relations*, and *Social relations* → *Amusement*. We can also consider an indirect linkage; for instance, eliciting the linkage of *Technical features* → *Amusement* from the linkage of *Technical features* → *Social relations* → *Amusement*. Ultimately all linkages were summarized in an implication matrix which depicts the number of times each topic (code) leads to each other topic in responses (Klenosky, 2002). As can be seen in Table 2, each topic in the row leads to the other topics in the column. For instance, T5 (*Social relations*) led to T8 (*Escapism*) 2 times; T11 (*Technical features*) led to T10 (*Amusement*) 5 times.

Typical means-end chain studies classify responses into attributes, consequences, and values and then produce a hierarchical structure of attributes → purposes → values. In order to mitigate classification errors, the current study employed an alternative method proposed by Bagozzi and Dabholkar (1994) and Pieters et al. (1995). Instead of classifying responses into three labels, this approach, which is based on network analysis (Scott, 1991), produces a hierarchical structure by comparing the number of times each element is mentioned as the means versus the end. The approach uses out-degrees and in-degrees in order to estimate abstractness of each element. Out-degrees of a particular element refer to the number of times the element serves as the source or origin (means) of linkages with other elements (i.e., the row sum of the element in an implication matrix), whereas in-degrees of the element indicate the number of times the element serves as the object or end of linkages with others (i.e., the column sum of the element in an implication matrix) (Pieters et al., 1995). Abstractness of an element is the ratio of in-degrees over in-degrees plus out-degrees of the element, and ranges from 0 to 1 (Pieters et al., 1995). Elements with high abstractness scores are regarded mainly as ends, while ones with low abstractness scores are thought of primarily as means. Based on the alternative approach, we created an implication matrix (see Table 3). Additionally, in order for informative analysis, this study calculated centrality of each element, which represents the degree to which the element has a

central role in the structure (Knoke and Burt, 1982). Centrality is calculated by dividing the ratio of in-degree plus out-degree of a particular element by the sum of all active cells in the implication matrix (the sum=167 in the current study).

Topics	*Codes*
T1. Addiction (removed)	Addiction/Hooked
T2. Creating	Creating virtual objects/Decorating own avatar or property/Creativity
T3. Educational tool (removed)	Educational tool
T4. Escapism	Escaping from reality/Free from disability
T5. Social relations	Social interaction/ Meeting people/Chatting/Social events/Dating Finding friendly users Having time with family or offline friends Helping people Worldwide availability/Interacting with diverse people
T6. Exploring	Exploring/Traveling/Adventuring/Walking around Lots of places/Large scale of the virtual world
T7. Financial	Economic freedom/Auction system Financial/Running a business/Making money
T8. Knowledge acquisition	Acquiring new ideas Doing research Improving practical skills (programming)
T9. Positive administration (removed)	Free membership Good administration of There.com Tutorial & class for training how to develop virtual objects
T10. Amusement	Fun/Enjoyment Gaming (paintball, spades) Movies/Music Relaxing/Reducing stress Something to do/Goofing off/Killing time Buggies
T11. Technical features	3D environment/Virtual reality/Graphic Human-like avatars' behavior Simple operation/ Easiness of navigation Teleport The map Voice/IM/Email (communication tools in *There*)

Table 2. Topics (Super codes) and Sub-codes

Abstractness	Centrality	Topics	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	Out-degrees
0.000	0.018	T1. Addiction										3		3
0.442	0.257	T2. Creating			3	4			4	5	1	5	2	24
0.800	0.060	T3. Educational tool								2				2
0.731	0.156	T4. Escapism		1			2					4		7
0.532	0.461	T5. Social relations		2	1	7		1		2	1	21	1	36
0.158	0.114	T6. Exploring		2			4					8	2	16
0.250	0.096	T7. Financial		7		2				1		2		12
0.722	0.108	T8. Knowledge acquisition			1	1	2					1		5
0.167	0.072	T9. Positive administration		3	2		3					1	1	10
0.725	0.413	T10. Amusement		1		2	12	1		1			2	19
0.195	0.246	T11. Technical features		3	1	3	18	1		2		5		33
In-degrees			0	19	8	19	41	3	4	13	2	50	8	167

* Out-degree: the number of times the element serves as the source or origin (means) of linkages with other elements
* In-degree: the number of times the element serves as the object or end of linkages with others
* Abstractness: (In-degrees) / (In-degrees + Out-degrees)
* Centrality: the degree to which the element has a central role in the structure. (In-degree + Out-degree) / the sum of all active cells

Table 3. Implication Matrix

The next step was to generate a hierarchical map according to the information in the implication matrix. In this stage, the important point was determining what linkages were included in a hierarchical goal map. Because inclusion of all linkages could decrease a map's usefulness and informativeness, we did not embrace all linkages and decided to employ a cutoff level (Reynolds and Gutman, 1988). Following Bagozzi and Dabholkar's (1994) method, we selected a cutoff of four, indicating that the included relations are counted at least four times. This cutoff level represented 30.0 % of the active cells and 64.1 % of the active linkages, which corresponds to a measure of variance (Gengler and Reynolds, 1995). According to the cutoff, T1 (*Addiction*), T3 (*Positive administration*), and T9 (*Educational tool*) were excluded because they had no linkage to satisfy the cutoff criterion.

The hierarchical map in Figure 2 offers a graphical summary of the means-end structure pertinent to using a SVW. In the map, the topics are placed relative to their abstractness scores. Accordingly, the more abstract a topic, the higher it is located in the map.

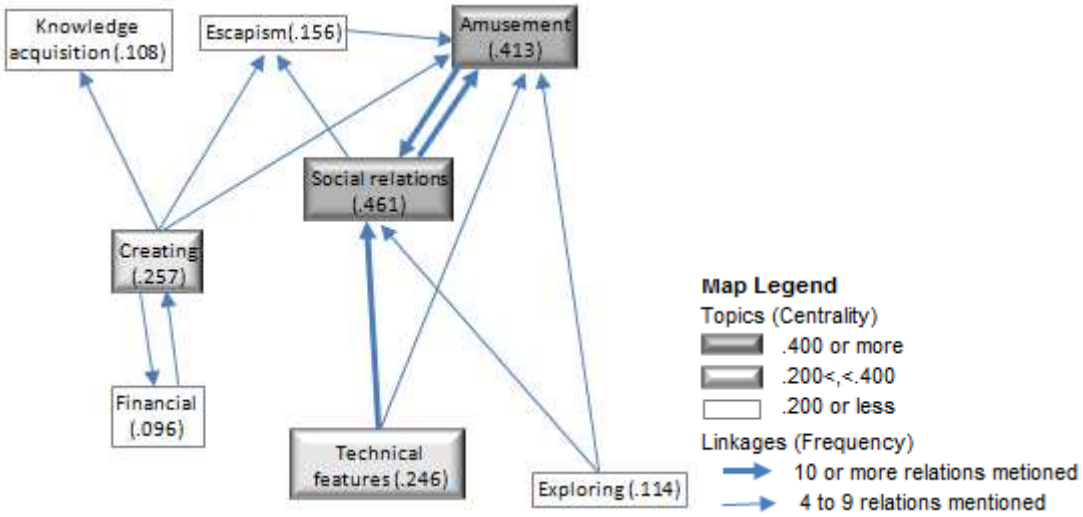

Figure 2. Hierarchical Purpose Structure for Social Virtual Worlds

DISCUSSION

A means-end analysis played an effective role in clarifying SVW users' purpose structure. The analysis is summarized in the hierarchical purpose map, which provides a quick and rich understanding of SVW users' purposes. The findings show that SVW users' purposes are usually overlapped with VC members' and GVW players' goals; yet they also have unique purposes. Compared to VC members, SVW users' purposes embrace VC members' purposes and further include distinctive ones, such as *Creation*, *Financial*, and *Exploring*. On the other hand, SVW users have differential purposes, or *Creation*, *Financial*, and *Knowledge acquisition*, from those of GVW players, and do not mention achievement, which is one of GVW players' goals. Accordingly, a SVW can be regarded as a novel cyberspace that allows users to engage in activities that are different from traditional VCs and GVWs. The specific findings are summarized below.

The results show that *Social relations* and *Amusement* are main goals for using SVWs from the viewpoint of abstractness and centrality, indicating that SVW users have goals that are similar to VC members and GVW players. *Social relations* correspond to VC members' major goal, and thus we can conclude that a SVW is another channel for expanding social relations, as are other social cyberspaces. *Amusement* is also mentioned as one of VC members' main goals. In the context of GVWs, Amusement is not explicitly stated as a goal (Yee, 2006); it can be considered an intrinsic goal in playing GVWs.

The most predominant relation is the link of *Technical feature* → *Social relations* → *Amusement*. This result indicates that various technical features (e.g., voice chatting, avatar interaction) help users expend social relations, which subsequently lead to amusement. Ultimately, considering the strong reciprocal feedback relation of *Social relations* and *Amusement*, users tend to aim at enjoyable social relations supported by technical features in SVWs. Both *Social relations* and *Amusement* are also supported by another topic of *Exploring*, which represents users' traveling to 3D spatial places where users come together for dancing or social events. Thus, *Exploring* is directly relevant to social communications. In addition, traveling to fantastic

places (e.g., exotic heaven) or real-like places (e.g., virtual New Orleans) may provide visitors with an experience that produce pleasure.

Escapism, which implies that users try to get out of their routine or constrained real-life environments (Hirschman, 1983), is one of the most abstract goals and corresponds to one of GVW players' goals. *Escapism* has a much higher position in the hierarchical goal map as the end of two intermediary goals (*Social relations* and *Creating*). Some users achieve the *Escapism* goal by making social relations in SVWs. To users with limited social activities (e.g., a disabled person, a housewife caring for four children), social interaction in SVWs can be a way to overcome their constraints in the real world, which eventually leads to positive feelings or amusement.

Creating is a goal that distinguishes VC members' goals from GVW players' goals. Despite the fact that not all SVWs enable their users to create virtual objects and even sell them, many SVWs do so. This behavioral autonomy is a unique characteristic of SVWs and is regarded as a central goal (3rd highest centrality). In particular, *Creating* has an important role of an intermediary goal that supports all three highest purposes in the hierarchical structure. By creating virtual objects, users have fun and improve their practical skills, such as computer programming. Also, by designing their avatars' appearances, which may be significantly different from their real appearances, or by creating imaginary virtual objects, they escape from constraints in real life.

Another point is that *Creating* has a reciprocal feedback loop with the *Financial* goal. Besides making virtual objects to satisfy their creative needs and imagination, users produce them partially with the intent to sell them in SVWs. Whether their intention is to gain self-contentment or do business, their creatures become fundamental contents of SVWs. VC research has stressed the importance of member-generated contents and further regarded them as a vital factor in VCs' success (Filipczak, 1998). However, according to prior studies, only 10 percent of members of one popular peer-to-peer sharing VC produced 87 percent of all contents (Adar and Huberman, 2000), and 4 percent of members in an open-source development VC produced 88 percent of new codes and 66 percent of code fixes (Mockus et al., 2000). Minor devotees produce almost all contents in pre-existing VCs, whereas SVW users consider the behavior for producing contents, or *Creating*, a central goal. Therefore, member-generated contents are more prominent in SVWs than in traditional VCs. Furthermore, transactional systems (e.g., virtual currency, virtual market for trading virtual objects) play some sort of incentive for users' creating behavior. SVWs' transactional systems can encourage users to create contents spontaneously without incentive systems supported by SVW providers. Thus, the combination of *Creating* and *Financial* has a strong self-sustaining function for SVWs. This finding provides current and future SVW providers with managerial insights: advancing a creating tool, reinforcing transactional systems, and guaranteeing secure transactions.

Knowledge acquisition is one of four of VC members' main goals (i.e., information exchange). *Knowledge acquisition* is, however, not a central goal to SVW users (the second lowest centrality), though it is one of the most abstract goals. Compared to *Social relations* and *Amusement*, *Knowledge acquisition* seems to be considered a minor goal in SVWs. This result may indicate that SVW users have focused on a social and entertaining goal up to now, rather than using SVWs for instrumental purposes.

LIMITATIONS

This study has the following three limitations. First, the study's samples may be biased in that the study surveyed users during a short term, and chose a convenient sampling method. The other potential bias with our data is that because the samples voluntarily responded the survey our results may be based on highly-motivated users' responses. Accordingly, the study has a limitation in fully generalizing the findings. Second, the study deals with only one type of SVW which supports 3D interfaces and endows users to create virtual object and sell them. Thus, the findings of the study should be re-examined on other SVWs, which have different environments, in future research. Furthermore, in order for further understanding of SVWs user goals, future research needs to compare them to users' purposes for other various social cyberspaces, such as conventional text-based VCs, social networking services, or weblogs.

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