INVESTIGATING THE ROLE OF NETWORK EXTERANLITIES AND PERCEIVED VALUE IN USER LOYALTY TOWARD A SNS SITE: INTEGRATING NETWORK EXTERNALITIES AND VTSL MODEL

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Abstract

As the number of SNSs increases, it is challenging for SNS providers to obtain and retain user loyalty toward a SNS site. By integrating both network externalities theory and VTSL (Value-Trust-Satisfaction-Loyalty) model, we propose a research model to investigate how perceived value derived from network externalities affects trust in SNS site and user satisfaction, which further lead to user loyalty. Data analysis was conducted using a total of 267 responses. The results show that perceived network size and perceived complementarity exert significant effect on functional, emotional, and social value. It is also shown that functional and social value influence positively on trust in SNS site, but emotional value is not related to trust. Functional and emotional value are found to be significant determinants of user satisfaction, however social value is not related to user satisfaction. User satisfaction is found to be a strong determinant of user loyalty. Given the findings, SNS providers need to increase network size and accommodate complementary services, applications, and supporting tools to obtain and retain user loyalty.

Keywords: Social Networking Service (SNS), Network externalities, Perceived value, Trust, Loyalty.

1 INTRODUCTION

As of February 2013, the number of SNS users worldwide has reached 1.2 billion, and that of Facebook users is expected to exceed 1 billion in 2013 (eMarketer, 2013). Myspace had been a dominant SNS provider until the end of 2008, but Facebook, with its superior SNS platforms and service portfolio, took over the SNS market and became the leading SNS provider. Although Google has competed against Facebook with Google plus, which is differentiated in connection with its core resources of search engine, YouTube, and map service, over the past few years, the number of SNS users is absolutely small compared to Facebook.

What enables the late mover Facebook to win the competition with the leading company Myspace in the SNS market, and remain competitive in intense competition with Google plus, Pinterest, etc.? Facebook's sustainable competitiveness seems to originate from obtaining and retaining user loyalty. Obtaining and retaining user loyalty is the essense of increasing firm's profitablity and sustaining firm's competitiveness (Yee et al., 2010). Users with high loyalty tend to repurchase, revisit, and reuse products or services, not to easily switch into other attractive products and services put on the market. They have also tendency to have positive affectivity and attachment to products and services, and to recommend them to other persons (Andreassen & Lindestad, 1998; Gerpott et al, 2001). Seen from Facebook's performance to date, Facebook holds a lot of users who have high attitudinal and action loyalty. The process that user's loyalty to a SNS site is formed can be explained by the VTSL (Value-Trust-Satisfaction-Loyalty) model (Cazier et al., 2006; Deng et al., 2010; He et al., 2012; Karjaluoto et al., 2012). Once users perceive diversified values in SNS site, they put their trust in SNS, and such trust will increase user satisfaction, ultimately making users have loyalty toward SNS. SNS providers are required to set off risk perceived by users in SNS in order to obtain and retain user loyalty, and to provide users with various values differentiated from other SNS sites. However, there have been less attention on examining how user loyalty is built and retained using the VTSL model in SNS context, morever, there have been few studies investigating on what are key determinants of perceived value that plays a crucial role in building and retaining user loyalty toward a SNS site in a direct and indirect way.

SNS is a typical two-sided market where complementary services are provided for a range of customer groups including user group, content provider group, solution provider group, and advertiser group. Direct and indirect network externalities play a huge role in business success in the two-sided market. SNS users perceive that as the size of SNS user network to which they belong becomes larger, they can build a relationship with more people and share more information (direct network externalities). In addition, as SNS users pleasantly communicate with more acquaintances and express themselves with diversified solutions, services, and contents, they perceive that they can enjoy benefits (indirect network externalities) such as building up social self-concept or self-image (Lin & Lu, 2011; Lin et al., 2011; Zhou & Lu, 2011). Consequently, network externalities play a pivotal role in generating a variety of values perceived by SNS users. In turn, perceived value derived from network externalities has direct and indirect impact on trust in SNS site, user satisfaction, and user's loyalty. In recent, a few studies began to empirically investigate how network externalities influence beliefs variables of TAM and perceived interactivity, which leads to satisfaction, or loyalty, or continuance intention to use in micro blog and mobile instant messaging service (Pontiggia & Virili, 2010; Lin et al., 2011; Lin & Lu, 2011; Zhou & Lu, 2011; Zhao & Lu, 2012). However, the overall value perceived by users derived from network externalities was not addressed from a multi-dimensional and perceived value perspective in their study. In addition, the role of network externalities in generating perceived vlaue has not been completely examined from the perceived value perspective in SNS context. The relationships between network externalities and VTSL model have not also been completely investigated in SNS context.

Thus, the purpose of this paper is to examine empirically how network externalities impact perceived value, and how perceived value derived from network externalities further influences trust, satisfaction and user loyalty toward a SNS site by integrating network externalities and VTSL model.

2   THEORECTICAL BACKGROUND AND HYPOTHESES

The research model was established based on intensive literature review (see <Figure 1>). We modified the VTSL (value, trust, satisfaction, loyalty) model suggested by Deng et al. (2010), He et al. (2012) and Karjaluoto et al. (2012), and combined network externalities and VTSL model to propose the research model and hypotheses. Deng et al. (2010) established the hypotheses that perceived value consisting of monetary value, functional value, emotional value, and social value predicts SNS user satisfaction. In addition, the hypotheses on the relationship among trust in SNS site, user satisfaction, and user's loyalty are established. Those hypotheses in our study are roughly consistent with Deng et al. (2010)'s research hypotheses, however, the relationship between perceived value and trust in SNS site was not hypothesized in the study of Deng et al. (2010). We established the hypothesis on the relationships between perceived value and trust in SNS site based on previous studies (Harris & Goode, 2004; He et al., 2012; Karjaluoto et al., 2012).

To complement the previous studies (Pontiggia & Virili, 2010; Lin et al., 2011; Lin & Lu, 2011; Zhou & Lu, 2011; Zhao & Lu, 2012), and examine perceived value derived from network externalities in an integarted and comprehensive way from the perceived value perspective, we proposed that network size and perceived complementarity are likely to have positive effect on functional, emotional, and social value. The proposed research model which is shown in Figure 1 addresses several research gaps.
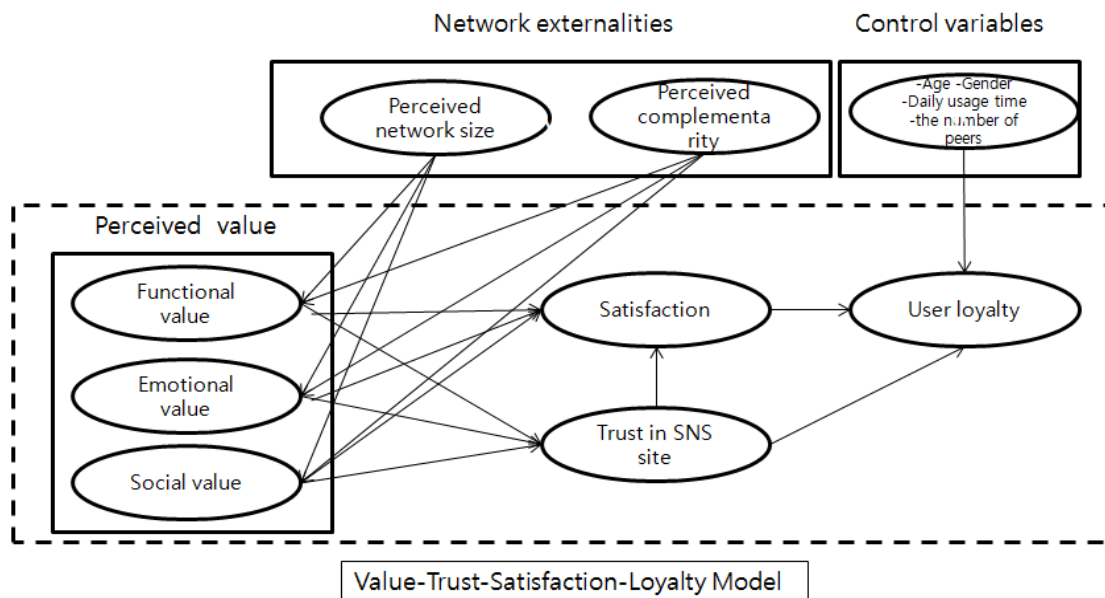

Figure 1.   Research model

2.1   VTSL (Value-Trust-Satisfaction-Loyalty)

2.1.1   *Trust in SNS site, User Satisfaction and User Loyalty*

Customer loyalty is purchaser's overall belief or devotion to product, service, brand and corporation (Oliver, 1999). Core marketing strategy in the service industry is to maximize customer retention by increasing customer loyalty (Reichheld, 1993). Generally, the core components of customer loyalty are satisfaction, recommend, and repurchase. Also, loyalty is classified into four: cognitive loyalty of preferring the brand to other alternatives with regard to the information of brand attributes, affective loyalty to be formed based on satisfactory experiences when product or service was used, conative loyalty of actually desiring to repurchase by positive influence on product or service, and action loyalty of repurchasing without considering the competitive brand and product as an alternative (Oliver, 1999). Cognitive loyalty is based on information about the product or brand whereas affective

loyalty includes attachment to and feelings of one brand. Affective loyalty is stronger than cognitive loyalty. Also, conative loyalty leads to immersion in a brand, inducing repurchase (Andreassen & Lindestad, 1998; Gerpott et al, 2001). Customer loyalty enhances corporate reputation and reduces costs to induce new customers, and increase repurchases of products and services, resulting in increasing corporate profit (Fornell, 1992).

Customer loyalty is one major driver of success in e-commerce (Reichheld & Schefter, 2000). e-Loyalty is customer loyalty to website or service in Internet- and web-based business environment, and connected with user's behavioural reaction of continuing revisit to the site, as well as customer attitude of having an affirmative talk about the site to his or her acquaintances (QI & FU, 2011). e-Loyalty is mostly influenced by cumulative or overall satisfaction. Compared to transaction-specific satisfaction, overall satisfaction reflects customer's cumulative impression of service provider's service formed by multiple interactions with the service provider (Yang & Peterson, 2004; Tsai & Pai, 2012), and cumulative satisfaction is a major determinant of user loyalty (Yang & Peterson, 2004; Tsai & Pai, 2012). That is, usually high overall satisfaction consolidates existing customer's loyalty, reduces price sensitivity to protect the existing customer, and decreases further transaction costs to reduce failure cost (Fornell, 1992). Several empirical studies support the relationship between user satisfaction and user loyalty in online services (Chang & Chen, 2008; Deng et al., 2010; Zhou & Lu, 2011; Chen, 2012). In light of the preceding discussion and findings, user loyalty to SNS will increase as long as users get overall satisfaction out of SNS services including instant response service, uploading pictures, interactive games, browsing other's page and customizability, and so on (Pai & Arnott, 2012). Accordingly, we hypothesize.

H1. SNS user satisfaction will have a positive impact on user loyalty.

Trust is a willingness to rely on an exchange partner in whom one has confidence (Moorman et al., 1993, p. 82). Trust is confidence in exchange partner's reliability and honesty (Morgan & Hunt, 1994). Trust can be divided into trust among individuals, trust between individual and organization, and trust between individual and object (website etc.) (Gefen & Straub, 2004). Trust contributes to decrease complexity to be incurred in uncertain environments by cutting down matters required to be considered in a given condition such as information exchange and transactions (Lewis & Weigert, 1985). Particularly, trust plays a more critical role in decreasing risk and complexity in websites or e-Commerce where activities are done without face-to-face encounter (Gefen et al., 2003). Several studies demonstrate that trust have a positive effect on user satisfaction (Lee & Chung, 2009; Deng et al., 2010) and user loyalty (Park & Kim, 2003; Pitta et al., 2006, Kim et al. 2009) in online services like e-commerce, mobile banking, mobile instant message, etc. Trust in SNS, which is capable of real-life connection by disclosing one's profile and sharing one's interests and activities with others real time, will be more influential to increase customer satisfaction than any other Internet services. Unless user trust in SNS site is formed while there is huge risk to be perceived by the user such as infringement of privacy and personal information leaks, SNS site will have much difficulty in satisfying customers and obtaining loyalty. Accordingly, we hypothesize.

H2. Trust in SNS site will have a positive impact on user satisfaction.

H3. Trust in SNS site will have a positive impact on user loyalty.

2.1.2   *Perceived Value, Trust in SNS site, and Users Satisfaction*

Perceived value is overall evaluation of utilities of the product or service given to customer, which depends upon consumer's perception (Parasuraman & Grewal, 2000; Lu et al., 2010). Perceived value may appear at various stages of purchase or repurchase (Sweeney & Soutar, 2001), and therefore, it may be incurred prior to purchase or use of the product or service, and plays a pivotal role in determmining an intention of customer relationships in the company (Tai, 2011). Perceived value is

divided into functional value (price and quality), social value, and emotional value (Sweeney & Soutar, 2001), or it is also divided into utilitarian value, intellectual value, and hedonic value (Sheth et al., 1991; Babin et al., 1994; Holbrook, 1994; Rintamaki et al., 2006). Functional value refers to performance or utility of product or service that the customer perceives (Cheng et al., 2009), which is composed of monetary value and quality (Sweeney & Soutar, 2001). Emotional value refers to utility to be derived from emotion or affective state that product or service generates (Sweeney & Soutar, 2001), which reflects pleasure, fun, and enjoyment (Turel et al., 2007). According to the study of Holbrook (1994) and Sheth et al. (1991), emotional value develops as product or service arouses customer's feelings. Previous experience and aesthetic pleasure in product or service, or fun to be perceived while using product or service will create emotional value (Karjaluoto et al., 2012). Social value refers to utility that customers perceive when they can reinforce social approval, social image, and social self-concept while using product or service (Bearden & Netemeyer, 1999; Karjaluoto et al., 2012).

Several empirical studies indicate that perceived value is a major predictor of online trust (Harris & Goode, 2004; Cazier et al., 2006; He et al., 2012; Karjaluoto et al., 2012). Functional value, monetary value, emotional value, and social value are proven to play a critical role in building trust in wireless telecommunication service (Karjaluoto et al., 2012). It is revealed that perceived value is a significant predictor of brand trust and customer satisfaction (He et al., 2012). In light of this, user trust in SNS site will be established when the user will perceive values as diversified as the user can set off perceived risk. In addition, prior empirical studies reveal that perceived value has a positive and significant effect on user satisfaction in online services (Yang & Peterson, 2004; Kuo et al., 2009; Deng et al., 2010; He et al., 2012). Functional value and emotional value are found to be a significant factor influencing user satisfaction (Deng et al., 2010). Accordingly, we hypothesize.

H4. Perceived value will have a positive impact on trust in SNS site.
    H4a: Functional value will have a positive impact on trust in SNS site
    H4b: Emotional value will have a positive impact on trust in SNS site.
    H4c: Social value will have a positive impact on trust in SNS site.

H5. Perceived value will have a positive impact on user satisfaction.
    H5a: Functional value will have a positive impact on user satisfaction.
    H5b: Emotional value will have a positive impact on user satisfaction.
    H5c: Social value will have a positive impact on user satisfaction.

2.2 Network externalities and perceived value

Network externalities mean that utility the user gains from product or service becomes larger with the increased number of persons who use the product or service (Katz & Shapiro, 1985). Varian (2006) defined network externalities as a special kind of externalities that some people's utility of specific products depends upon the number of others who consume the product (Top et al., 2011). Accordingly, once the size of user network reaches critical mass, benefits from network externalities will increase, which makes more users crowd into user network (Lin & Bhattacherjee, 2008). Network size and perceived complementarity are core factor of inducing network externalities (Top et al., 2011). Network size is connected with direct network externalities that in the network of consumer side, benefits of users belonging to the network increase with the increased number of network users.

On the contrary, perceived complementarity means indirect network externalities that the higher the diversity and availability of complementary goods and services provided in the network of supplier site is, the more the utilities perceived by the user are. Namely, availability of complementary products or services in the network influences the benefit or value perceived by the user for the products or services (Lin et al., 2011). For example, the value of Internet portals counts heavily on the availability of various contents such as movies, musics, games, and services like blog, interactive bulletin, mobile SNS, e-mail, instant messenger and so forth. Thus indirect network externalities are significantly related with user perceptions of the value of Internet portal. In turn, increase in network size depends

heavily on the variety and availability of complementary goods or services in the market. Having high complementarity derived from an existing or new service or application may gain a larger user base (Hwang & Oh, 2009).

Some previous studies demonstrated that network externalities are key determinants of perceived benefits such as perceived beliefs and perceived interactivities in online context (Hwang & Oh, 2009; Pontiggia & Virili, 2010; Lin & Lu, 2011; Lin et al., 2011; Zhou & Lu, 2011; Zhao & Lu, 2012). It is found that network size has a significant effect on perceived usefulness whereby it is not related to perceived enjoyment (Lin & Lu, 2011). Perceived complementarity plays a pivotal role in enhancing both usefulness and enjoyment perceived by users. However, network size positively influences perceived usefulness whereas it is not associated with perceived enjoyment (Zhou & Lu, 2011). Synchronization value is positively affected by perceived critical mass, and autarky value is positively influenced by availability of complementary goods in e-service context (Lin et al., 2011). Perceived network size and complementarity exerts strong influence on perceived playfulness and connectedness in micro blogging service (Zhao & Lu, 2012).

In light of the preceding discussion and findings, perceived beliefs and benefits derived from network externalities can be functional value, emotional value, and social value from the perceived value perspective (Sheth et al., 1991; Sweeney et al., 2001). Such phenomenon will be shown to be similar in SNS. A social networking service is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections (Wikipedia, 2012). Social networking sites allow users to share ideas, activities, events, and interests within their individual networks (Wikipedia, 2012). Thus, benefits or values perceived by SNS users differ from perceived network size and availability of complementary goods and services available on SNS site that they use. SNS users will perceive that they can form social relationship with more people and share more information and ideas necessary for their life and job performance in a easy and convenient way as long as there are a lot of SNS users and diversified SNS services. In addition, they will perceive that the more the existing installed bases of users and services available in SNS are, the more the opportunities of real time sharing their interests, activities, and pleasure are, and furthermore, the chances of expressing themselves, feeling the social existence, and realizing the social self-concept such as building up their image. Thus, it seems that both network size and perceived complementarity are major significant determinants of functional value, emotional value, and social value. Accordingly, we hypothesize.

H6. Perceived network size will have a positive impact on perceived value.
   H6a: Perceived network size will have a positive impact on functional value.
   H6b: perceived network size will have a positive impact on emotional value.
   H6c: perceived network size will have a positive impact on social value.

H7. Perceived complementarity will have a positive impact on perceived value.
   H7a: Perceived complementarity will have a positive impact on functional value.
   H7b: Perceived complementarity will have a positive impact on emotional value.
   H7c: Perceived complementarity will have a positive impact on social value.

2.3   Control variables

In addition to determinants of user's loyalty, this study controls the number of peers, because a previous study shows that the number of peers influences continuance intention to use SNS (Lin & Lu, 2011). As user loyalty encompasses continuance intention to use, the number of peers is likely to affect user loyalty. Further controls pertain to two demographic variables and one SNS usage varaible: age, gender, and daily average usage time of SNS.

3 DATA COLLECTION AND MEASUREMENT DEVELOPMENT

3.1 VTSL (Value-Trust-Satisfaction-Loyalty)

Several SNS researchers were asked to review the initial survey questionnaire before data collection. Subsequently, a pilot study was conducted in a college class and a graduate class. Survey questionnaire was finalized based on comments of SNS researchers and pilot study. And, survey data was gathered at four university campuses which are located in different cities and provinces such as Seoul, Chungnam and Kyunggi provinces, and Jeju Island in Korea. In addition, we use Facebook and email to collect survey data online. All survey responses were scrutinized and we removed invalid responses, including those with the same answers to all questions or with too many missing data. Consequently, a total of 267 valid responses were used to analyze reliability and validity, and to test hypotheses.

73 % of the respondents were female and 27% were male. Much more than half of the respondents were in their twenties (85.8%) and were university students (77.9%). 40.8% have used SNS for 1-2 years, and the frequently used SNS was Facebook (79.4%). 49.8% were those who using SNS less than one hour a day.

3.2 Measurement development

All measurement items employed five-point scales ranging with 1 representing "strongly disagree" and 5 representing "strongly agree". Perceived network size is measured with four items modified from Lin & Lu (2011) and Zhao & Lu (2012). While four items for measuring perceived network complementary were adapted from Lin & Lu (2011). Functional value was measured using a scale of four items revised from Chen & Hu (2010) and Lu & Hsiao (2010). Emotional value scale consist of four items modified from Deng et al. (2010) and Lu & Hsiao (2010), and social value was measured using a scale of four items based on Chen & Hu (2010) and Deng et al. (2010). The trust in SNS site was measured with five items modified from Karjaluoto et al. (2012). User satisfaction was measured with three items adapted from Casalo et al. (2010) and Zhao & Lu (2012). Finally, user loyalty scale consists of five items with two items measuring word-of-mouth, adapted from Casalo et al. (2010) and Chen & Hu (2010).

4 DATA ANALYSIS AND RESULTS

4.1 Assessment of Measurement model

Measurement and structural model of this study were assessed using the commercial software package AMOS rel. 16. Confirmatory factor analysis was conducted to test validity of each construct. The fit indices indicated that the measurement model fit was good: $\chi2/df$ was 1.859, the RMSEA was 0.057, GFI was 0.834, AGFI was 0.799, CFI was 0.918, TLI was 0.928, and NFI was 0.929 (Steiger & Lind, 1980). Convergent validity was assessed using three criteria. T values demonstrate that all standardized item loadings were significant at 0.001. The CRs ranged from 0.75 to 0.89 and the AVEs ranged from 0.53 to 0.75 except the AVE value of social value, demonstrating good convergent validity (Fornell & Larcker, 1981). Cronbach's alpha values ranged from 0.780 to 0.922 exceeding the 0.7 reference value, indicating good reliability (Nunnally, 1978).

Construct	Items	Standardized item loading	t-value	CR	AVE
Perceived network size	NS1	0.801	12.036	0.83	0.55
	NS2	0.735	11.139		
	NS3	0.696	10.567		

		NS4	0.731	-		
Perceived complementarity		NC1	0.629	-	0.76	0.53
		NC2	0.816	10.514		
		NC3	0.749	9.935		
		NC4	0.705	9.491		
Functional value		FV1	0.844	-	0.86	0.60
		FV2	0.89	17.082		
		FV3	0.778	14.497		
		FV4	0.557	9.419		
Emotional value		EV1	0.845	-	0.92	0.74
		EV2	0.799	15.935		
		EV3	0.917	20.135		
		EV4	0.873	18.459		
Social value		SV1	0.645	10.367	0.79	0.48
		SV2	0.631	10.309		
		SV3	0.843	-		
		SV4	0.638	10.240		
Trust in SNS site		TS1	0.711	9.676	0.83	0.54
		TS2	0.786	10.526		
		TS3	0.777	10.464		
		TS4	0.659	-		
		TS5	0.723	9.916		
User satisfaction		US1	0.883	18.882	0.89	0.75
		US2	0.851	-		
		US3	0.844	17.467		
		US4	0.879	18.761		
User loyalty		UL1	0.845	12.807	0.81	0.56
		UL2	0.779	11.881		
		UL3	0.66	10.136		
		UL4	0.701	-		
		UL5	0.746	11.407		
Fit indices		χ^2= 916.648, DF = 493, CMIN/DF = 1.859, P value = 0.000, GFI = 0.834, AGFI = 0.799, IFI = 0.929, TLI = 0.928, CFI = 0.918, RMSEA = 0.057				

Table 1. Confirmatory factor analysis results

Shown in Table 2, all the correlation coefficients were less than square root of AVE, indicating that discriminant validity is adaptable (Fornell & Larker 1981).

Construct	Mean	Standardized deviation	NS	NC	FV	EV	SV	TS	US	UL
NS	4.0693	.82283	**.74**							
NC	3.8914	.75587	.652**	**.73**						
FV	3.6348	.77864	.405**	.447**	**.78**					
EV	3.3549	.87184	.372**	.430**	.564**	**.86**				
SV	3.1901	.66721	.267**	.368**	.429**	.590**	**.69**			
TS	3.1715	.71489	.290**	.347**	.554**	.457**	.463**	**.73**		
US	3.5852	.85069	.444**	.481**	.571**	.736**	.550**	.535**	**.86**	
UL	3.5401	.79793	.486**	.477**	.485**	.648**	.489**	.501**	.730**	**.75**

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)
Diagonal elements represent the square root of variance shared between the constructs and their measures, the off-diagonal elements are the correlations among the constructs.

Table 2. Discriminant validity analysis resutls

4.2 Assessment of structural model

AMOS rel. 16 was employed to test structural model. The fit indices indicated that the research model fit was good: χ^2/df was 1.933, RMSEA was 0.059, GFI was 0.809, AGFI was 0.777, CFI was 0.901, TLI was 0.891, and NFI was 0.902 (Steiger & Lind, 1980). The results of testing the hypotheses are as follows.

First, user satisfaction had strong significant impact on user loyalty ($\beta=0.740$, $p<0.001$). Thus H1 is supported. Trust in SNS site influenced positively on user satisfaction ($\beta=0.313$, $p<0.01$) whereas it was not related to user loyalty ($\beta=0.047$, $p>0.1$). Thus, H2 was supported and H3 was not supported.

Second, Functional value ($\beta=0.258$, $p<0.001$) and social value ($\beta=0.260$, $p<0.01$) exerted a significant effect on trust in SNS site, but emotional value ($\beta=0.144$, $p>0.1$) was not related to trust in SNS site. Thus, H4a and H4c were supported, H4b was not supported. In addition, functional value ($\beta=0.157$, $p<0.01$) and emotional value ($\beta=0.503$, $p<0.001$) had a positive and significant effect on user satisfaction, but, social value ($\beta=0.084$, $p>0.01$) was not related to user satisfaction. Thus H5a and H5b were supported, H5c was not supported.

Third, functional ($\beta=0.274$, $p<0.001$), emotional ($\beta=0.226$, $p<0.001$), and social value ($\beta=0.115$, $p<0.1$) was influenced by network size. Thus, H6a, H6b, and H6c were supported. In addition, perceived complementarity had a significant effect on functional ($\beta=0.382$, $p<0.001$), emotional ($\beta=0.370$, $p<0.001$), and social value ($\beta=0.264$, $p<0.001$). Thus, H7a, H7b and H7c were supported.

Finally, user loyalty was affected by gender ($\beta=0.085$, $p<0.05$), daily usage time ($\beta=0.154$, $p<0.01$), and the number of peers ($\beta=0.182$, $p<0.001$), but age ($\beta=0.004$, $p>1$) was not related to user loyalty. The results of testing hypotheses are summarized in Figure 2.

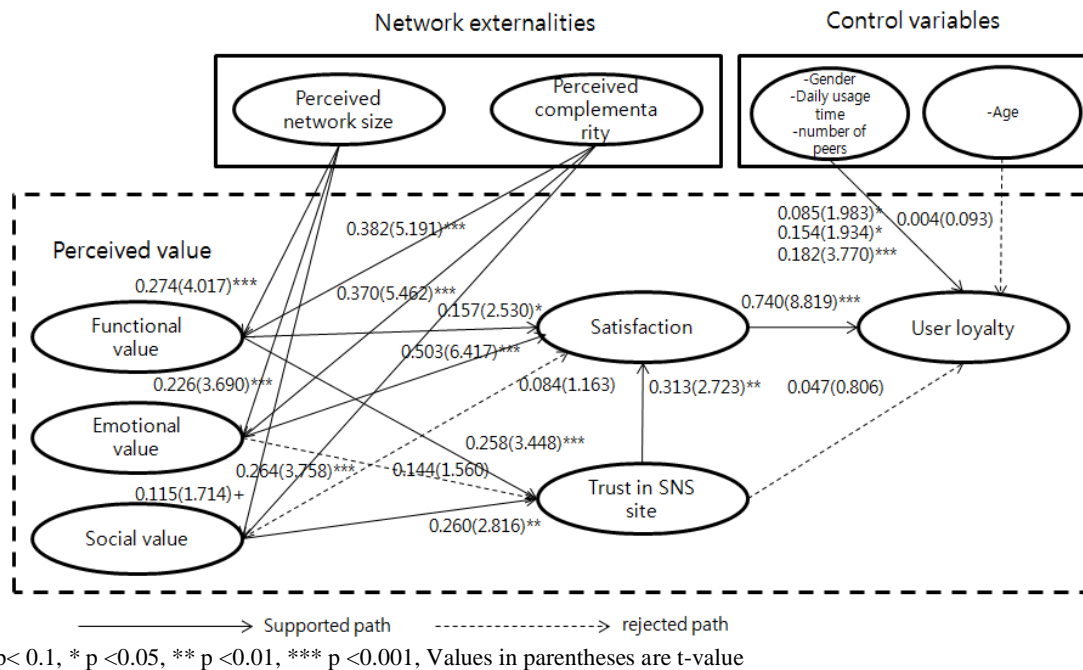+p< 0.1, * p <0.05, ** p <0.01, *** p <0.001, Values in parentheses are t-value

Figure 2.   Structural model test results

5   DISCUSSION

We examined the role of network externalities in value perceived by SNS users, and further investigated the relationship among perceived value, trust in SNS site, user satisfaction, and user's loyalty. The findings are as follows:

Firstly, the results show that all dimensions of perceived value are affected by perceived network size.

The result that network size influences functional value is consistent with the findings of previous studies (Slyke et al., 2007; Deng & Wang, 2010; Zhou & Lu, 2011). It can be interpreted that the larger the number of SNS users is, the more SNS users feel control over SNS. With increasing network size, more convenient and innovative facilitating conditions would be offered to make services and applications available on SNS site more easy to use (Zhou & Lu, 2011).

The result that emotional value is related to network size is inconsistent with Zhou & Lu (2011)'s findings, and is partially consistent with Lin & Lu (2011)'s study. The number of peers and enjoyment were confirmed to be related whereas there was no relationship between the number of members and enjoyment (Lin & Lu, 2011). However, Lin & Lu (2011) instated that there was gender difference in the relationship between the number of members and enjoyment. That is, female SNS users perceive more enjoyment with growing SNS users whereas male SNS users do not. In our study, network size was measured with both the number of SNS users and the numbers of peers or acquaintances, and many survey respondents were female. In light of this, our finding about the relationship between network size and perceived emotional value is consistent with the results from Lin & Lu (2011)'s study. Meanwhile, given the findings from Zhou & Lu (2011)' and our study, SNS users mostly communicate and share their interests and activities real time with peers of their acquaintances using SNS. It is seemingly that SNS users perceive emotion such as pleasure, enjoyment, etc. while organizing events, contacting and keeping up with their friends or acquaintances, and exchanging information about their interests, daily activities, and events with peers connected through social network. Also, SNS users perceive social values through social interaction with peers of their acquaintances and express themselves toward many and unspecified persons to enhance their image or social self-concepts.

Secondly, it is also shown that perceived complementarity is major significant determinant of functional value, emotional value, and social value. These findings are consistent with the conclusion of prior studies (Lin & Lu, 2011; Lin et al., 2011; Zhou & Lu, 2011; Zhao & Lu, 2012). Usually, SNS providers are competitively providing users with complementary services including personal information entry and opening, joining for friends and networking, sharing links, persons, places, and contents, and mobile service. Such complementary services enable users to share a variety of information and rapidly communicate, and also share daily activities and interests anywhere and anytime. With this, users perceive that they can efficiently obtain a variety of high-quality information. Also, applications, services, and supporting tools available in SNS platforms enable users to express themselves and enhance their image by uploading personal information they would like to show off, and to perceive social value like feeling the social existence through peers who immediately respond to their behavior. With this, SNS users can freely share their emotion through interpersonal network with complementary services, experience a range of complementary services to induce both functional value and social value and at the same time, perceive emotional value like pleasure and enjoyment. Therefore in SNS, perceived complementarity is the strong source of functional value, emotional value, and social value to be perceived by users.

Thirdly, it is shown that functional value and social value contribute to building trust in SNS site. The study of Karjaluoto et al. (2012) demonstrates that trust is influenced by perceived value consisting of functional value, monetary value, emotional value, and social value in wireless telecommunication service. Overall perceived value exerts positive impact on brand trust (He et al., 2012). Generally, the results of this study are consistent with prior studeies. However, the finding of this study that emotional value is not related to trust in SNS site is not consistent with the conclusion of Karjaluoto et al. (2012). This indicates that trust in SNS site will be formed only when users can more conveniently and efficiently use SNS, understanding of peers who form social relationship in SNS can be facilitated, and they perceive that they can manage their image or reputation well. It is deemed that the study result that emotion value is not related with trust in SNS site originates from the characteristic of respondents to questionnaire in this study. Most of the respondents are using Facebook, which is lack in supporting tools to support users' emotional expression, compared to Cyworld or Pinterest. If users can use skins or emoticons suitable for each situation like Cyworld and hold more tools to express their emotion in a diversified and frank way, emotional context and information shared among peers in SNS will become more reliable, and furthermore, trust in SNS site to help such emotional information

to be expressed and delivered well will be increased.

Fourthly, the results reveal that emotional value exerts a strong significant effect on user satisfaction (β=0.505, p<0.001), and functional value has a positive impact on user satisfaction. These findings are almost cositstent with the results of previous studies (Kuo et al., 2009; Deng et al., 2010). In constrast with what we expected, the role of social value in satisfying SNS user is not found in SNS. The results provide evidence that social value is not associated with user satisfaction in mobile instant mesasages (Deng et al., 2010). This indicates that SNS is aimed at functional and emotional utility for user like other Internet services. They rather recognize friends or peers they meet with in SNS as subject of small talk than realize their true selves and enhance their image and social self-concept in SNS. Therefore, SNS users do social interaction with other peers for small talk or real-life connection (Zhao & Lu, 2012), but it is seemingly that they do not perceive that their reputation, image, social self-concept, and self-impression are enhanced through social interaction. If users perceive that their self-image, self-impression, and social self-concept are enhanced by social interaction through SNS, then they will feel more satisfied with SNS services. Therefore, SNS provider needs to incorporate the sophisticated complementary services or applications into platforma to allow user to enhance his/her social self-concept.

Finally, the results dematrate that trust in SNS site has a positive impact on user satisfaction, and user satisfaction is a strong siginificant predictior of user loyalty. The results of this study are consistent with serveral previous studies on oline services. This indicates that the higher abilities, benevolenance, and integrity of SNS site is, the higher the user satisfaction at SNS site becomes. Furthermore, increased user satifaction enhances user's loyalty toward SNS site.

6 CONCLUSION

6.1 Implications

From a theoretical perspective, we extend research on user's loyalty toward SNS site by integrating network externalities with VTSL (Value-Trust-Satisfaction-Loyalty). More specifically, we examined perceived value derived from network externalities, and the relationships among perceived value, trust in SNS site, user satisfaction, and user's loyalty. Previous studies on the relationships between network externalities and perceived value are still insufficient. There exist a few studies on the relationship between two constructs in SNS context. Our empirical findings show that network externalities are major soruce of functional value, emotional value, and social value. Thus, this study expands the theoretical understanding of the impact of network externalities on values perceived by SNS users. In addition, the effect of perceived value on trust in SNS site and user satisfaction was investigated. As trust is one of major drivers in success of online services, and social captials like trust are key resource in SNS site, it is very important to examine how perceived value affects trust in SNS site. However, examining the relationships between two constructs has been ignored in SNS context. Fuctional value and social value are proven to be predictors of trust in SNS site, but emotional value is found not to be related with trust in SNS site. Given the results of this study and the findings of previous studies, the results of studies on the effect of emotional value on trust are not consistent, and therefore, further studies are required to be made to investigate their causal relationship in other contexts. In consequence, it is certain that this study contributes to the illustration of the role of fucnational value, emotional value, and social value in building trust in SNS site through empirical testing in a more systematic way.

Futhermore, the results of this study provide evidence that higher trust in SNS site leads to higer user satisfaction, and increased user satisfaction enhances user's loyalty toward SNS. These results indicate that trust and user satisfaction paly a critical role in enhancing user's loyalty toward SNS site. Seen from the discussions and findings mentioned above, this study filled several research gaps in the field of user's loyalty toward SNS by integrating network externalities and VTSL, and reestablished and tested the hypotheses on the relationships among network externalities, perceived value, trust, user satisfaction, and user loyalty.

On the practical side, it is likely that the results of this study offer strategic directions and managerial guidelines to SNS providers. SNS is a typical two-sided market in which multi-customer groups are interconnected through service platforms. Network externalities can also be two-sided: more usage by one group of customers increases the value of complementary services and applications to another distinct group of customers, and vice versa (Tunnard, 2012). The indirect network externalities that occur from the increased quality and availability of complementary applications and services are probably much more crucial for SNS users to perceive functional value, emotional value, and social value. Functional value and social value derived from network externalities exerted a significant effect on trust in SNS site. In addition, functional value and emotional value from complementary services influenced user satisfaction, further determining user loyalty. Thus, SNS providers should make every effort to increase network size and complementary services, applications, and supporting tools by acquiring or merging the distinguished firms, and strengthening partnerships with differentiated contents and solutions providers.

6.2   Limitations

There are some limitations in this study. There are difficulties in generalizing the findings of this study because many survey respondents are in their 20s and 30s and female, and this study only tested the proposed research model with a Korean sample. In addition, major moderators are not considered to identify the relationship between network externalities and perceived value. Personal characteristics such as self-efficacy, number of peers, and culture may be major factors to moderate the relationship between two constructs. Thus, further studies are required to be made to investigate the moderating effect of self-efficacy, demographic characteristics and culture on the relationship between network externalities and perceived value.

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