WHAT DRIVES CUSTOMER ENGAGEMENT BEHAVIOR?
THE IMPACT OF USER PARTICIPATION FROM A SOCIOTECHNICAL PERSPECTIVE

Chang-Tang Chiang
Department of Information Management, Chinese Culture University
No. 55, Hwa-Kang Road, Yang-Ming-Shan, Taipei, Taiwan 11114
arthurctchiang@gmail.com

Ming-Hsien Yang
Department of Information Management, Fu Jen Catholic University
No. 510, Zhongzheng Rd., Xinzhuang Dist., New Taipei City, Taiwan 24205
mhyangfjuim@gmail.com

Tian-Lih Koo
Department of Accounting, Shih Chien University
No.70, Dazhi St., Zhongshan Dist., Taipei, Taiwan 10462
kootl@g2.usc.edu.tw

Chien Hsiang Liao [*]
Department of Information Management, Fu Jen Catholic University, Taiwan
No. 510, Zhongzheng Rd., Xinzhuang Dist., New Taipei City, 24205
jeffen@gmail.com

ABSTRACT

Recent studies have shown that using social media is a new way of promoting user participation and understanding potential user needs for a service firm. However, user participation via social media might produce synergistic and interactive effects, including issues of social interaction with members and technical interaction with social media. The purpose of this study is to examine the impact of user participation via social media on continuance intention and customer engagement behavior from a sociotechnical theory perspective. In total, 381 respondents were selected in the context of the social network brand community. The hypothesized associations were examined by using partial least squares-structured equation modeling. This study found that interaction with social members (social issues) mediates the association from social media (technical issues) to continuance intention. Additionally, continuance intention is positively associated with customer engagement behavior. These findings not only complement the theoretical arguments of sociotechnical theory but also enrich the understanding of the existing literature on relational marketing.

Keywords: User participation; Social media; Sociotechnical theory; Brand community; Human-computer interaction

1. Introduction

Customer participation has been indicated to be associated with competitive advantages for firms, for example, by uncovering customer demands [Chien & Chen 2010], improving customer loyalty [Chen et al. 2015], shortening production time to market [Fang 2008], and diminishing cycle time from production to consumption [Lundkvist & Yakhlef 2004]. Customer participation can be regarded as a new approach to product/service cocreation, which might cover idea generation, product testing, product support, and service process improvement [Nambisan 2002]. Prior studies have shown that customers have been transformed from a passive audience into active participants.

Therefore, stimulating customer participation is an important issue. According to the existing literature, continuance intention has been widely regarded as the key determinant of measuring the effectiveness of customer participation [Chiu et al. 2007; Liang et al. 2011; Vatanasombut et al. 2008]. Therefore, this study adopts this

---

[*] Corresponding Author

indicator to evaluate the outcome of customer participation. Continuance intention is defined as user intention to continue using the services and applications [Chiu et al. 2007] or the intention to maintain their relationship with a firm [Zeithaml et al. 1996]. In the field of marketing, continuance intention has been widely proven to provide several benefits for a firm, such as improving revenue, reducing the cost of customer retention [Rapp et al. 2013], and stimulating customer referrals [Schmitt et al. 2011]. It can also be treated as a manifestation of customer satisfaction or loyalty [Chen et al. 2012].

Strengthening customer participation through social media has also been a trend in recent years. Social media platforms (e.g., Twitter, Facebook, Instagram) have gradually become novel tools that allow customers to share their preferences and exchange information [Kaplan and Haenlein 2010]. Customers have shifted from being passive recipients of information to becoming active generators of information [Stewart & Pavlou 2002]. Most importantly, social media can be treated as an important tool or mechanism to enhance customer participation and further enable product or service cocreation between firms and customers [See-To and Ho 2014]. For instance, if a firm wants to create a new product or service for customers, social media can easily be used to obtain feedback and suggestions from them. Indeed, Rishika et al. [2013] also suggested that customer participation in a firm's social media efforts leads to an increase in the frequency of customer visits.

However, until now, customer participation has merely been treated as the degree (or frequency) to which the customer was involved in producing and delivering the service [Bendapudi & Leone, 2003], overlooking that customer participation was a process of human interaction. In other words, treating customer participation as a single indicator may oversimplify its possible impact. The quality of this interaction process may lead to a positive or negative impact on customers. To fill this gap in the literature, this study regards customer participation as a process that might involve social issues and technical issues from a sociotechnical perspective. That is, if the firm adopts social media to interact with its customers, customer participation might be affected by technical issues (e.g., social media itself) and social issues (e.g., social interactions with stakeholders). The purpose of this study is to examine the impacts of both issues on continuance customer participation and community behavior, which are manifested by continuance intention and customer engagement behavior, respectively. More specifically, sociotechnical theory (or perspective) indicates that an organization is a combination of social and technical systems [Trist 1981]. If an organization wants to achieve better business efficiency, it must rely on the fit between people and technology [Liao 2015]. In the context of this study, a technical system refers to the technical characteristics or capacity of social media, while a social system represents the relationships among customers, the brand, product, company, and other customers in social media [Habibi et al. 2014; McAlexander et al. 2002; Muniz & O'Guinn 2001]. In other words, this study proposes that customer participation can be regarded as the fit between social and technical systems captured from social media interaction. This fitness will be related to or reflected in organizational performance, which is in turn measured by continuance intention and customer engagement behavior. The specific research questions are as follows:

RQ1. *Will continuance intention (customer participation) be affected by technical and social issues?*
RQ2. *Will continuance intention lead to customer engagement behavior?*

2.   Theoretical foundation
2.1.   Sociotechnical theory

Sociotechnical theory refers to the interrelatedness of social and technical aspects of an organization. This theory emphasizes that organizational development and performance are dependent on the interaction between technology and human behavior in the workplace [Mumford 2006]. That is, the maximal performance of an organization results from the joint optimization of social and technical systems [Trist 1981]. The term 'social system' refers to human factors embedded in social groups, e.g., responsibilities, obligations, norms, social support, social interaction ties and perceptions, while 'technical system' indicates the hardware, software, personal expertise or techniques that help an organization transform productive resources into economic performance [Lee 2018]. For instance, information communication technology is usually regarded as the typical technical system, as it not only connects people in social groups but also drives the interaction among these groups to contribute to organizational profits [Kolb 2008]. The primary objective of the sociotechnical approach is to ensure that both human and technical factors reach congruence and coordination through IT implementation [Mumford 2006].

In the context of social media, the interaction between a customer and the firm can be interpreted as the combination of social and technical systems in sociotechnical theory. More specifically, the social system captures the customer's or the firm attitude, perception, adoption, and mutual relationship among social groups. In contrast, the technical system represents the processes, tasks, functions, and technology that are needed to fulfill customer needs [Lee et al. 2006]. This theory draws upon ideas from the sociotechnical tradition for uniquely studying information technology and its relationship with individuals and social collectives [Sarker et al. 2019]. Most

importantly, the theory is also suitable to interpret customer participation in social media. For instance, Wan et al. [2017] use the sociotechnical systems perspective to investigate user motivation to donate to content creators in social media. Following this idea, the proposed research model is shown in Figure 1. The literature on related concepts will be reviewed as follows.
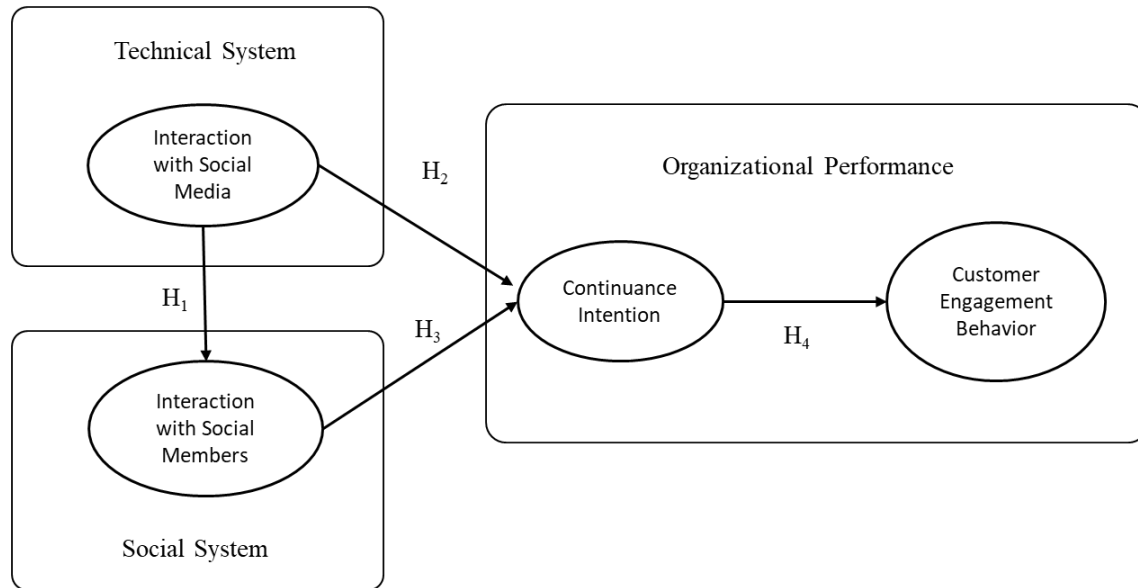

Figure 1. Research model

2.2.   Technical system: Interaction with social media

The technical system emphasizes the relationship between people and technology and includes the characteristics of information technology, personal expertise and required knowledge. In this study, social media (e.g., Twitter or Facebook) refers to information technology, so when users interact with social media, it involves technical issues based on sociotechnical theory. During social interaction via social media, this study proposes that three characteristics could be captured as technical systems that provide users with abilities or system functions to facilitate further interactions, including (1) competence to use social media, (2) feedback on using social media, and (3) playfulness when users engage in social media. These three characteristics are elaborated as follows.

Competence refers to one's belief in his or her ability to succeed in specific situations or to complete tasks [Bandura 1986]. In the field of information systems, self-efficacy is similar to the concept of competence. It has been widely used to measure individual belief in the ability to perform an action such as the use of a computer, web technology, or social media [Bandura 1986; Gangadharbatla 2008; Shih 2006]. For example, individuals with higher self-efficacy for web technology typically are more confident in their ability to successfully understand, navigate, contribute, and evaluate online content [Gangadharbatla 2008]. Most importantly, one's competence or self-efficacy is strongly related to task performance. Shih [2006] found that individuals with higher computer competence would have higher outcome expectations in computer-related tasks than those with lower competence. Although competence is generally regarded as a personal belief or ability, it is associated with the outcomes of interactions between people and social media according to the perspective of sociotechnical theory. Therefore, we treat competence as a technical system measuring whether consumers are able to use social media. It is defined as the degree to which a user perceives his or her ability to use social media.

Feedback on using social media is also an important characteristic of a technical system. Reputation is an important personal unique asset that drives users to achieve and maintain status within a social network [Wasko & Faraj 2005]. According to social exchange theory, user participation in social interaction results from an expectation that will lead to social rewards such as approval, status, and respect [Blau 1964]. Most importantly, positive feedback from a social network is a key motivation for users to pursue current status and future achievement [Oreg & Nov 2008]. In the context of social media, feedback consists of reviews or comments from other users. Other users might give feedback in various ways, such as text, images, videos, or forwarding provided by the social media platform. The more positive feedback received from other users is, the higher the reputation or approval is that the contributor will obtain [Chen et al. 2011; Laroche et al. 2012]. In this study, feedback is defined as the degree to

which overall information is received from other users in the social community, including the number of replies, likes, and shares.

Playfulness represents the enjoyment of the experience while users engage in social media. In addition to competence and feedback, hedonic motivations have been proven to be able to motivate user participation in online activities [van der Heijden 2004]. Hedonic motivations can be measured as personal pleasure, playfulness, and emotional experience [Lowry et al. 2015]. Indeed, prior studies suggest that users are more willing to use information technology while the entertainment or playfulness element is incorporated into it [Baek et al. 2011; Kamis et al. 2008; Venkatesh et al. 2012]. That is, the playfulness of information technology is strongly related to usage. To apply this notion to the context of social media, this study regards playfulness as one of the technical systems influencing the usage of social media and user participation.

2.3.   Social system: Interaction with social members

With the advance of information technology, social media has become an increasingly popular tool to create social interaction among people. Social media allows users to exchange information quickly and conveniently [Kaplan & Haenlein 2010], as with Facebook, Twitter, and Line software. Most importantly, firms have begun to use it to communicate with customers and manage customer relationships in the brand community [Ansari et al. 2011; Habibi et al. 2014; Kuo & Hou 2017; Laroche et al. 2012], and it might provide some benefits. Customers could not only receive new information from the community but could also actively participate in the firm's activities and increase the possibility of value cocreation with the firm [Laroche et al. 2012]. For the firm, social media enable it to interact with customers, thus making the firm better able to understand customer needs or preferences for a product or service, thereby producing a more acceptable product [Sashi 2012]. Therefore, social media play a critical role in facilitating interactions between customers and the firm. To clearly emphasize their commercial applications, social media hosted by a firm to interact with customers in the brand community is defined as a social network brand community (SNBC) in this study. For example, the popular SNBCs include Apple Support Community by Apple, PlayStation Community by Sony, and My Starbucks Idea by Starbucks.

Muniz and O'Guinn [2001] denote that the brand community is a specialized, nongeographically bound community that is structured according to social relations among brand admirers. Following this definition, McAlexander et al. [2002] suggest that the brand community should be customer-centric and could be divided into four relational dimensions: (1) customer to offering (product or service), (2) customer to company, (3) customer to brand, and (4) customer to other customers. More specifically, the customer-to-product relationship captures customers' feelings about the product they own, such as product satisfaction and preference. The customer-to-brand relationship measures the brand-related values for customers, such as perceived brand value or brand loyalty. The customer-to-company relationship captures the feelings customers have about the organization that sponsored the event. This dimension reflects the company concern for customers, e.g., the company cares very much about its customers. The customer-to-others relationship represents the feelings customers have about other customers, such as sharing similar interests with other members. To carefully examine different aspects of the brand relationship in an SNBC, this study adopts the measurement as described by McAlexander et al. [2002] as an interaction with these social members.

2.4.   Organizational performance: Customer engagement behavior and continuance intention

In an era of emphasizing the power of the customer, marketing managers and scholars have become interested in consumer engagement behavior (CEB) as a rational dimension of consumer participation [Mohammad et al. 2020; van Doorn et al. 2010]. Vivek et al. [2012] defined consumer engagement as the intensity of an individual's participation in the organization offerings and activities initiated by either the customer or the organization. Kim et al. [2013] argue that CEBs are composed of persistent activities, attitudes and intrinsic motivations as well as other characteristics such as positive affect, feedback, novelty, and interactivity. More specifically, CEB captures influencing behaviors through referrals and word-of-mouth, as well as customer participation in product development [Kumar et al. 2010]. This concept is similar to influencing and codeveloping types of CEBs mentioned by Jaakkola and Alexander [2014]. Following these concepts or definitions by Kumar et al. [2010], this study proposes that CEB is defined as proactive, durable, and valuable behaviors that contribute to a brand community for value cocreation beyond a transaction. Moreover, this study uses recommendations, information sharing, and providing product or service improvements for the measurement of CEB.

Furthermore, continuance intention refers to a user's intention to continue using the product or service [Chiu et al. 2007]. In the context of this study, user participation is focused on member interaction in an SNBC. Thus, continuance intention is defined as a user's intention to continue using an SNBC. More specifically, continuance intention includes not only revisiting the community [Huang & Shih 2019; Liang et al. 2011] but also actively participating in community activities [Jang et al., 2008]. In this study, we treat CEB and continuance intention as organizational or activity performances affected by social and technical systems from a sociotechnical perspective.

3. Hypothesis development

3.1. The linkage from technical system to social system

According to sociotechnical theory, a firm's development or performance relies on the fit between social and technical systems, including interactions with social members and technology [Liao, 2015]. Although social and technical systems might interact with each other, this study proposes that technical systems will affect social systems, particularly if users exploit social media technology for contact with social members. In the context of an SNBC, users need to be familiar with the technical functions of social media to enable interaction with other members and improve social interaction. Based on the literature reviewed in the previous section, if a technical system possesses the characteristics of *competence*, *feedback* and *playfulness*, it will enable users to use social media or system functions to reply to other members' opinions. Indeed, people who have high competence or self-efficacy will be likely to perform related behaviors [Bandura 1986]. Additionally, Hsu et al. [2007] suggest that users' self-efficacy has a positive effect on their knowledge-sharing behavior. Because online social interaction with social media requires technology competence and more proactive and autonomous behavior, this study proposes that users with high social media competence will positively influence interactions with other members.

Similarly, a social media application (e.g., an SNBC) possesses feedback and playfulness mechanisms that will be positively associated with usage and will further improve user interactions with other social members. More specifically, prior studies have shown that users obtain reputation or approval when they receive positive feedback and responses from others [Chen et al. 2011; Hennig-Thurau et al. 2004]. This might increase their continuance intention to interact with other members. Moreover, perceived playfulness has strong effects on interesting tasks [Moon & Kim, 2001], and it has been proven to be associated with user behavioral intentions and actual usage [Hsu & Chiu 2004; Webster & Martocchio 1992].

Recent findings in intrinsic motivation and self-efficacy research indicate that playfulness [Hsu & Chiu 2004a; Moon & Kim 2001; Webster & Martocchio 1992] and computer self-efficacy [Agarwal et al. 2000; Compeau & Higgins 1995; Venkatesh & Davis 1996] also play important roles in determining a user's behavioral intentions and actual usage. Based on the discussion above, this study expects that interactions with social media captured by competence, feedback, and playfulness will positively affect interactions with social members.

H1: *Interaction with social media positively affects interaction with social members.*

3.2. The linkage from the technical system to continuance intention

Competence or self-efficacy is strongly related to satisfaction and task performance because people with high self-efficacy deal more effectively with difficulties and persist in the face of failure, are therefore more likely to achieve expected outcomes and thereby derive satisfaction from tasks [Liu et al. 2010]. Moreover, Luarn and Lin [2005] suggest that perceived self-efficacy has a positive effect on behavioral intention. In this vein, this study predicts that the higher the social media competence users have, the higher the continuance intention they might have for using an SNBC. In addition, loyalty intention and behavioral intention seem to act as a kind of positive feedback for the group of employees [Salanova et al. 2005]. Additionally, Demerouti et al. [2001] suggest that performance feedback is a predictor of engagement behavior. If an SNBC could establish a positive feedback mechanism, members would receive feedback as approval from others when they share information. This mechanism would motivate the members to keep sharing information and increase their continuance intention to use an SNBC. Furthermore, prior studies also suggest that perceived playfulness will contribute significantly to user satisfaction [Webster et al. 1993], users' intent to reuse a website [Lin et al. 2005], and continuance intention for e-learning [Roca & Gagne´ 2008]. According to the discussion, this study proposes that the interaction with social media measured by competence, feedback, and playfulness will positively affect a member's continuance intention.

H2: *Interaction with social media positively affects continuance intention.*

3.3. The linkage from the social system to continuance intention

For the interaction with social members, it seems reasonable to argue that a strong member relationship will lead to behavioral intention. According to the literature on marketing, the relationship with customers is a strong predictor of behavioral intentions [Choi et al. 2004; Cronin et al. 2000]. The rationale is that maintaining enduring relationships with customers will contribute to the development of relational marketing, thereby enhancing loyalty intention and word-of-mouth [Hennig-Thurau et al. 2002]. Thus, this study predicts that the strong relationship with social members in an SNBC will positively influence a member's continuance intention.

H3: *Interaction with social members positively affects continuance intention.*

3.4. Linkage from continuance intention to customer engagement behavior

In the context of the online brand community, CEB is more accurate than purchase behavior for explaining the consequences of relationship quality because the online community may not involve actual purchase behaviors. For a brand community, CEB exhibits more proactive and valuable behaviors that contribute to value cocreation beyond

the transaction. As mentioned in the second section, recommendations, information sharing, and providing product or service improvements are three key concepts of CEB [Kim et al. 2013; Kumar et al. 2010; Verleye et al. 2014].

Most importantly, loyalty intention or continuance intention can be regarded as attitudinal antecedents of engagement behaviors [Hirschman 1970]. If a customer has a strong continuance intention to participate in an SNBC, he or she might exhibit CEBs to the brand community. More specifically, he or she might deliver positive word of mouth to friends, provide suggestions for products and services, and share information or answer questions to other members. In this vein, this study proposes the following hypothesis:

H4: *Continuance intention positively affects customer engagement behavior.*

4. Methods

4.1. Measurement

The study conducted an online questionnaire survey to test the research hypotheses. To fit the context of social media, the measures of the proposed model were adapted from prior studies. The proposed model consists of four constructs. For the interaction of social media, the questionnaire items regarding competence, feedback, and playfulness underlying the interaction of social media were adapted from the 4 items of Shih [2006], 3 items of Ko [2013], and 3 items of Xu et al. [2013], respectively. Underlying the interaction of social members, four subconstructs for customer-to-product/service, customer-to-brand, customer-to-company, and customer-to-customer were adapted from the 16 items of Habibi et al. [2014] and Shen et al. [2010]. Furthermore, six items of continuance intention were adopted from the measures of Liang et al. [2011] and Ku et al. [2013], and five items of CEB were developed from the concept of CEB by Kumar et al. [2010]. Five-point Likert scales were used for all items, anchored by strongly disagree (1) and strongly agree (5).

4.2. Data Collection

To validate our constructs, a pilot test was conducted with 173 respondents. Among these respondents, 19 were excluded because their responses contained many missing values or because they had never used an SNBC before. The response rate was 89%. The results of the pilot test showed that the composite reliability (CR) of continuance intention was less than the threshold (.7). More specifically, we initially used three items developed by Liang et al. [2011] to measure continuance intention. However, the factor loadings of two items were less than .7 in the pilot test, leaving only one item for continuance intention. To improve the reliability of continuance intention, two original items were excluded, and another three items of continuance intention developed from Ku et al. [2013] were added to the questionnaire. The detailed questionnaire items are addressed in Appendix A.

Table 1. Descriptive statistics

Characteristics	Percent	Characteristics	Percent
Gender		Occupation	
Male	62%	Service	25%
Female	38%	Student	18%
Marriage		IT	16%
Single	46%	Other	10%
Married	54%	Finance	9%
Age		Public service	7%
Below 19	2%	Manufacture	6%
20-29	26%	SOHO	5%
30-39	34%	Homemaker	4%
40-49	30%	Communication	1%
50-59	6%	Education	
Above 60	2%	High school	9%
		Junior college	13%
		University	58%
		Master	20%

A total of 427 respondents were selected from an online survey in Taiwan. Forty-six respondents were excluded because they had never used an SNBC, leaving 381 valid respondents. The response rate was 89.2%. Among these respondents, 38% were female, 62% were male, 54% were married, and 46% were single. The majority of respondents were between 30 and 39 (34%) years old; 58% of respondents had a 4-year university degree, and 25% reported that their occupations were in the service industry. Table 1 shows the descriptive statistics of the 381 respondents.

Due to the research context, an examination of internet usage behavior is necessary. Table 2 shows that 33% of respondents always use the internet and 33% use the internet for 1~3 hours per day. Additionally, 81% of respondents reported that they had used the internet for more than 7 years. Regarding the social media platforms, Facebook dominates the usage of social media (66%), and consumer electronics are the most popular brand community (25%). In the dataset, 27% respondents note that they have more than 4 years of experience using an SNBC. Regarding the SNBC specialty, 36% of respondents replied that their communities were highly specialized.

5. Results

Before examining the proposed model, this study tested the nonresponse bias as described by Armstrong and Overtons [1977]. We divided the dataset into two groups and compared the demographic variables between early and late respondents using the F-test [Thompson & Phua 2005]. The results show that the p-value is .207 for age (χ^2 = 7.188, df = 5), .277 for SNBC specialty (χ^2 = 5.101, df = 4), .144 for experience using an SNBC (χ^2 = 6.849, df = 4), .403 for average hours of internet usage per day (χ^2 = 4.204, df = 4), and .137 for internet usage history (χ^2 = 6.985, df = 4). According to the results, these two groups have no significant differences in sample demographics. In addition, this study used the T-test to examine the difference in survey responses between the two groups. The results show that there are no significant differences in competence (T = 1.287; P > .05), playfulness (T = 1.020; P > .05), feedback (T = 1.257; P > .05), customer-to-product (T = .889; P > .05), customer-to-brand (T = .769; P > .05), customer-to-company (T = .822; P > .05), customer-to-other customers (T = .586; P > .05), continuance intention (T = -.118; P > .05) and CEB (T = .811; P > .05). Both results indicate that there is no nonresponse bias problem in this study.

Furthermore, this study uses partial least squares-structured equation modeling (PLS-SEM) to test the research hypotheses because it is suitable for predicting the structure model and aims to maximize the explained variance of dependent variables [Henseler et al. 2009]. Moreover, PLS-SEM is explicitly recommended for models of the second-order latent construct, and the proposed model is composed of several second-order constructs.

To evaluate the proposed model for both first-order constructs and second-order constructs, this study adopts the two-step procedure of evaluation [Hair et al. 2012; Henseler et al. 2009]. That is, we assess the measurement model first and then further examine the structural model. Additionally, this study conducts a comparative analysis of the second-order factor model with first-order models following the approach by Lu and Ramamurthy [2011].

Table 2. Internet and SNBC usage

Characteristics	Percent	Characteristics	Percent
Average hours of internet usage per day		History of internet usage	
Less than 1 hour	5%	Less than 1 year	1%
1~3 hours	33%	1~3 years	3%
3~5 hours	15%	3~5 years	7%
5~8 hours	14%	5~7 years	8%
Always connected	33%	More than 7 years	81%
Online brand community*		Social media	
Consumer electronics	25%	Facebook	66%
Other	16%	Google+	14%
Beverage	12%	Line	13%
Media	11%	Other	5%
Food	8%	Instagram	2%
Shopping	7%	Yahoo	1%
Car	7%	Experience using an SNBC	
Clothes	6%	Less than 1 year	15%
Grocery	3%	1 ~2 years	25%
Finance	2%	2 ~3 years	18%
Shoes	2%	3 ~4 years	15%
Book	1%	More than 4 years	27%
SNBC specialization			
Very low	6%		
Low	10%		
Average	38%		
High	36%		
Very high	10%		

Note: * Online brand community was an open question, and one of the authors coded the industry.

5.1.   The Measurement Model
    The measurement model should fit the requirements of reliability, internal consistency, convergent validity, and discriminant validity [Henseler et al., 2009]. The reliability of questionnaire items is used to check whether the loading of each item on its latent construct is higher than the recommended threshold of .5 [Hair et al., 2006]. Internal consistency is evaluated by the composite reliability scores for each latent construct. The composite reliability scores are interpreted in a similar way to Cronbach's α (threshold value is .7). The AVE (average variance extracted) indicates the level of convergent validity, and the generally acceptable cutoff value is .5. Discriminant validity is conducted in two parts. Following the statement by Fornell and Larcker [1981], the AVE of each latent construct should be higher than the construct's highest squared correlation with any other latent construct. Second, each indicator's loading should be higher than all of its cross-loadings with other latent variables.
    The analysis results of the measurement model are shown in Table 3 and Table 4. The results indicate that the Cronbach's α of each construct is higher than .9, the AVE of each construct is greater than .6, and the factor loading of each construct is greater than .7. Overall, the reliability and validity of the measurement model are supported.

5.2.   The Structural Model
    This study uses SmartPLS 2.0 software to test the structural model by using a bootstrap resampling technique. Based on the results in Figure 2, the interaction with social media is positively associated with the interaction with social members (β = .685; P < .001), indicating that H1 is supported. Contrary to our expectation, the interaction with social media does not have a positive impact on continuance intention (β = .050; P > .05), while the interaction with social members has a significant effect on continuance intention (β = .702; P < .001). Therefore, H3 is supported, while H2 is not supported. We suspect that there might be a mediation effect among the interaction with social media, interaction with social members, and continuance intention. In this vein, we adopt Baron and Kenny's [1986] approach for testing the mediation effect, including (a) performing regression with a dependent variable on the independent variable; (b) performing regression with a mediator on the independent variable; and (c) performing regression with a dependent variable on both the mediator and the independent variable. While the path coefficient for the independent variable in step (a) is significant, the coefficient is insignificant in step (c), meaning the mediator has a complete mediation effect (Baron & Kenny, 1986). The results of the mediation test are shown in Figure 3. The results show that the coefficient of the interaction with social media is not significant when incorporating the interaction of social members as the mediator. It reveals that the interaction with social members has a complete mediation effect among the variables.

Table 3. AVE, CR, Cronbach's α, and Correlations

	AVE	Composite Reliability	Cronbach's Alpha	Interaction with Social Media	CEB	Interaction with Social Members	Continuance Intention
Interaction with Social Media	0.632	0.945	0.936	**0.795**			
CEB	0.781	0.934	0.905	0.631	**0.884**		
Interaction with Social Members	0.627	0.962	0.957	0.685	0.699	**0.792**	
Continuance intention	0.911	0.976	0.967	0.531	0.660	0.736	**0.954**

Note: The (bold) diagonal elements represent the square root of AVE.
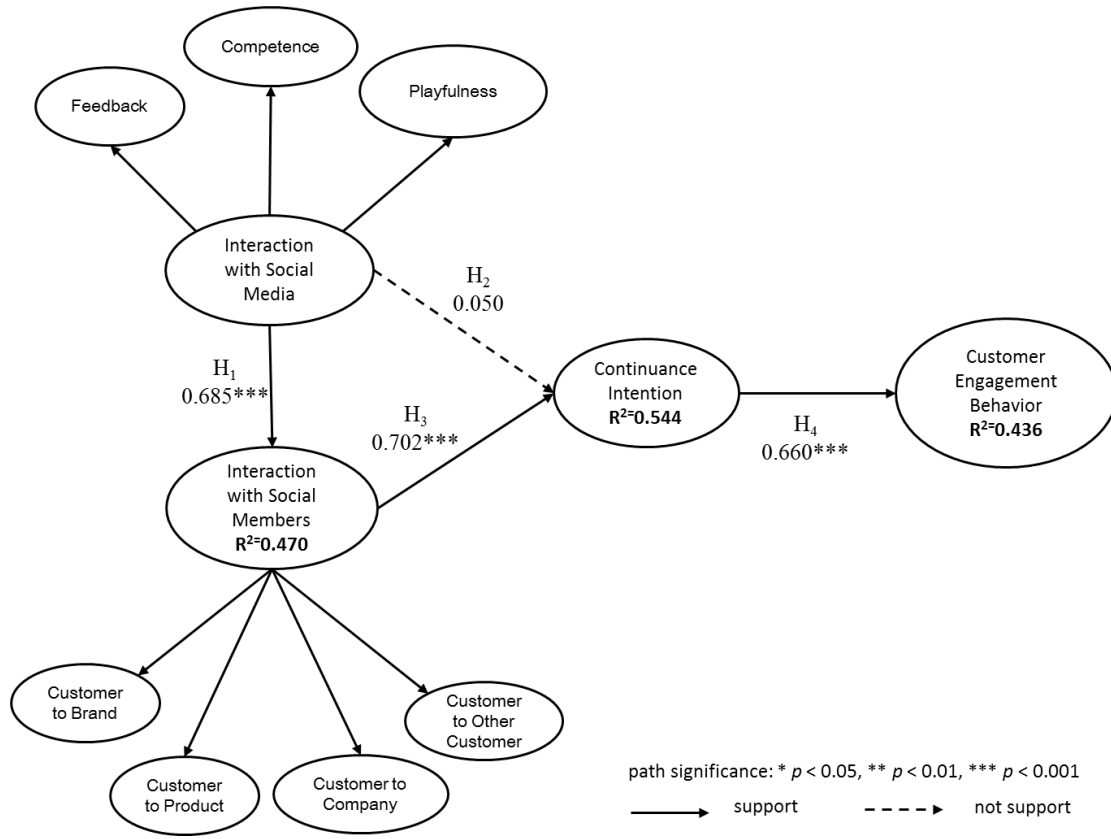
Figure 2. Results of the proposed model

Table 4: Second-order factor loadings

Construct	Item	CEB	Continuance intention	Interaction with social media	Interaction with social members
Playfulness	PL1	0.59	0.51	**0.78**	0.61
	PL2	0.63	0.52	**0.81**	0.61
	PL3	0.62	0.54	**0.79**	0.66
Feedback	AF1	0.53	0.36	**0.79**	0.45
	AF2	0.57	0.36	**0.82**	0.48
	AF3	0.53	0.32	**0.73**	0.51
Competence	AP1	0.54	0.40	**0.79**	0.51
	AP2	0.61	0.44	**0.82**	0.54
	AP3	0.59	0.34	**0.84**	0.48
	AP4	0.54	0.32	**0.78**	0.45
Customer-to-Brand relationship	CB1	0.53	0.61	0.47	**0.79**
	CB2	0.51	0.58	0.47	**0.79**
	CB3	0.61	0.65	0.48	**0.82**
Customer-to-Company relationship	CC1	0.67	0.51	0.56	**0.75**
	CC2	0.63	0.47	0.52	**0.77**
	CC3	0.60	0.52	0.54	**0.79**
	CC4	0.58	0.58	0.46	**0.78**
Customer-to-Other customers relationship	CO1	0.64	0.56	0.60	**0.79**
	CO3	0.68	0.58	0.64	**0.73**
	CO4	0.66	0.54	0.61	**0.71**
Customer-to-Product relationship	CP1	0.62	0.64	0.55	**0.87**
	CP2	0.60	0.65	0.55	**0.86**
	CP3	0.59	0.62	0.53	**0.84**
Customer engagement behavior	EB1	**0.74**	0.53	0.58	0.50
	EB2	**0.82**	0.61	0.52	0.66
	EB3	**0.80**	0.47	0.61	0.62
	EB4	**0.76**	0.42	0.65	0.50
	EB5	**0.83**	0.63	0.56	0.70
Continuance intention	CI1	0.66	**0.95**	0.50	0.70
	CI2	0.68	**0.97**	0.50	0.72
	CI3	0.63	**0.96**	0.47	0.68
	CI4	0.65	**0.94**	0.52	0.69

Moreover, the results show that continuance intention has a positive effect on CEB (β = .66; P < .001), supporting H4 as expected. In the whole model, the explained variances (R^2) of interaction with social members, continuance intention, and CEB are 47%, 54.4%, and 43.6%, respectively. This implies that the variables we incorporated into the study have explanatory power for dependent variables. In addition, this study adopts a 'marker variable' to test for the presence of common method variance (CMV). Lindell and Whitney [2001] propose that if observed relationships among variables measured using the same method are affected by noncongeneric CMV, the variance can be identified and partially explained by using a proxy (i.e., marker variable). A marker variable can be chosen post hoc from existing study variables by selecting the one with the smallest observed correlation with those variables or is theoretically unrelated to other scale in the questionnaire [Simmering et al. 2015]. Therefore, we choose 'average hours of internet usage per day' as a marker variable because it is theoretically unrelated to other constructs. Following the six-step procedure for controlling for CMV when using PLS-SEM [Rönkkö &Ylitalo 2011], the results show that the path coefficients in the model are almost the same and only vary slightly (see Appendix B), indicating that there is no concern of CMV in this study.
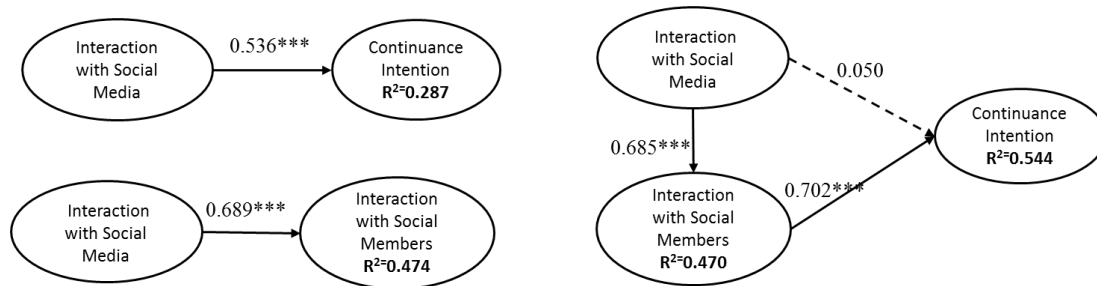
Figure 3. Mediation test

5.3.   Comparative Analysis

This study conducts a comparative analysis of the second-order model with first-order models based on the five steps by Lu and Ramamurthy [2011]. The steps include: (1) Model 1, a first-order one-factor model on which all the measure items were loaded; (2) Model 1A, a constrained first-order model that sets the correlations between the factors to one; (3) Model 2, an uncorrelated first-order model that sets the correlations between the factors to zero; (4) Model 3, a freely correlated first-order model that allows the correlations between the factors to be freely estimated; and (5) Model 4, a second-order model. The fit indices of the five models are presented in Tables 5 (for the interaction with social media) and 6 (for the interaction with social members). The results show that the model fit of the second-order construct is (or close to) the highest value. Treating these constructs as second-order constructs is suitable for the research model.

Table 5: Model fits for the interaction with social media

	χ^2	(df)	$\chi^2/(df)$	NFI	CFI	GFI	AGFI
Model 1: first-order one-factor model	995.78	35	28.45	.71	.72	.63	.42
Model 1A: constrained first-order three-factor model	611.44	35	17.47	.82	.83	.78	.65
Model 2: uncorrelated first-order three-factor model	1031.02	35	29.46	.70	.70	.71	.54
Model 3: freely correlated first-order three-factor model	521.03	32	16.28	.85	.86	.82	.69
Model 4: second-order factor model	174.55	32	5.46	.95	.96	.91	.84

Table 6: The model fits for the interaction with social members

	χ^2	(df)	$\chi^2/(df)$	NFI	CFI	GFI	AGFI
Model 1: first-order one-factor model	1434.07	65	22.06	.71	.72	.58	.41
Model 1A: constrained first-order four-factor model	516.06	65	7.94	.88	.91	.84	.77
Model 2: uncorrelated first-order three-factor model	1241.26	65	19.10	.75	.76	.67	.54
Model 3: freely correlated first-order three-factor model	297.27	59	5.04	.94	.95	.90	.84
Model 4: second-order factor model	354.65	61	5.81	.93	.94	.89	.83

6.   **Discussion and implications**

This study provides several theoretical and practical implications. First, this study extends sociotechnical theory to the study of social media and customer participation. This study contributes to providing a different perspective for treating customer participation, which enriches the related literature. The empirical results also suggest that technical and social systems have direct or indirect impacts on customer participation and behavior. Theoretical implications deliver a signal that when future researchers apply information technology to interact with users, they should consider both technical and social issues in the research model. In practice, firms should allocate equal resources to strengthen technology use and relationships with social members, e.g., providing a more convenient message or reminder function via social media to stimulate member interaction.

Second, this study reveals that interaction with social members has full mediation between interaction with social media and continuance intention. One plausible explanation is that the interaction of a social member (i.e., the social system) yields more importance than social media does because it is directly concerned with user experience and user participation in an SNBC. The interaction with social media (i.e., the technical system) plays a supporting role. That is, the more technical system support there is, the better the interaction is between members. Most importantly, better interaction with social members will lead to higher member continuance intentions. The finding

reveals that if organizational performance is concerned with socially related indicators (e.g., continuance intention or CEB), the social system will become the main control system, while the technical system will be a supporting system.

Third, although the technical system is not a main control system, it still plays the role of stimulating the interaction of members. Playfulness is one of the key elements for improving the interaction with members in an SNBC. An online brand community manager can post interesting and funny content in the form of text, picture, or video, thereby attracting users to participate. Additionally, we recommend that a manager could design game-based activities or marketing campaigns to invite online users. Likewise, for competence, although technology is well developed now, interactive activity in social media should be designed to be as friendly as possible, thus enabling the use of social media without any entry barriers. The third element is feedback. During user participation, the brand community manager should provide an appropriate feedback mechanism to encourage user interaction. Taking Facebook as an example, the like button on Facebook, text replies, and image support are all types of feedback mechanisms. In addition to direct feedback from the manager, feedback from other members also fosters participation by posters and inspires them to engage in the community.

Fourth, the findings indicate that members' continuance intentions of using an SNBC are significantly associated with CEBs. Although continuance or loyalty intentions have been commonly treated as a consequence of the customer relationship [Bowden 2009; van Doorn et al. 2010; Vivek et al. 2012], this study proposes that CEB is more suitable to the context of the online brand community than to continuance intention because the former reflects relational values and cocreative behaviors with members. This finding suggests that when a firm aims to encourage engagement behavior, increasing customer loyalty intention seems to be necessary. The finding also enriches our understanding of the existing literature on relational marketing.

Finally, the interaction with social members, which this study proposed, contains four aspects of relational dimensions. The findings reveal that these four dimensions all contribute to the development of members' continuance intentions. This is similar to the statement of Labrecque et al. [2013] and indicates that the customer has become more powerful today and should be conceptualized using various dimensions. This finding suggests that business managers should realize this concept and maintain different dimensional customer relationships. Ignoring any one of the relational dimensions might result in a 'ripple effect,' thus destroying the other relational dimensions and brand loyalty at the same time.

7. Conclusion and limitations

This study contributes to the examination of associations between user participation and both continuance intention and CEB from the perspective of sociotechnical theory. The findings suggest that both technical and social systems have positive impacts. However, in the context of relational marketing, the social system is the primary means to promote members' continuance intentions because it is directly involved with user experience and user participation. Comparatively, the technical system is a supporting system designed to enhance the social system. Although this study provides several implications, there are two limitations that should be noted. First, the research context is the online community. The offline environment and environmental factors are excluded in this study, which limits the research scope. Moreover, customer affective factors are omitted in this model. For example, prior studies indicate that the antecedents of continuance intention and engagement behavior involve personal affective factors [Bowden 2009; Day 1969; Hennig-Thurau et al. 2002; Oliver 1980]. This study encourages future researchers to extend our model and incorporate more effective indicators into the research model.

REFERENCES

Agarwal, R., V. Sambamurthy, V. and R.M. Stair, "Research report: The evolving relationship between general and specific computer self-efficacy – An empirical assessment," *Information Systems Research*, Vol. 11 No. 4:418-430, 2000.

Armstrong, J.S. and T.S., Overton, "Estimating nonresponse bias in mail surveys," *Journal of Marketing Research*:396-402, 1977.

Ansari, A., O., Koenigsberg, and F. Stahl, "Modeling multiple relationships in social networks," *Journal of Marketing Research*, Vol. 48 No. 4:713-728, 2011.

Baek, K., A. Holton, D. Harp and C. Yaschur, "The links that bind: Uncovering novel motivations for linking on Facebook," *Computers in Human Behavior*, Vol. 27 No. 6:2243-2248, 2011.

Baron, R. M. and D.A. Kenny, "The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations," *Journal of Personality and Social Psychology*, Vol. 51 No. 6:1173-1182, 1986.

Bandura, A. Social foundations of thought and action: A social cognitive theory, Prentice-Hall, Inc., 1986.

Bendapudi, N. and R.P. Leone, "Psychological implications of customer participation in co-production," *Journal of Marketing*, Vol. 67 No. 1:14-28, 2003.

Blau, P. M. Exchange and power in social life, Transaction Publishers, 1964.

Bowden, J.L.H. "The process of customer engagement: a conceptual framework," *The Journal of Marketing Theory and Practice*, Vol. 17 No. 1:63-74, 2009.

Chen, J., H. Xu, and A. B. Whinston, "Moderated online communities and quality of user-generated content," *Journal of Management Information Systems*, Vol. 28 No. 2:237-268, 2011.

Chen, S.C., D.C. Yen and M. I. Hwang, "Factors influencing the continuance intention to the usage of Web 2.0: An empirical study," *Computers in Human Behavior*, Vol. 28 No. 3:933-941, 2012.

Chen, S. C., C. Raab, and S. Tanford, "Antecedents of mandatory customer participation in service encounters: An empirical study," *International Journal of Hospitality Management*, Vol. 46:65-75, 2015.

Chien, S. H. and J. J. Chen, "Supplier involvement and customer involvement effect on new product development success in the financial service industry," *Service Industries Journal*, Vol. 30 No. 2:185-201, 2010.

Chiu, C.M., C.S. Chiu, and H.C. Chang, "Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention," *Information Systems Journal*, Vol. 17 No. 3:271-287, 2007.

Choi, K.S., W. H. Cho, S. Lee, H. Lee and C. Kim, "The relationships among quality, value, satisfaction and behavioral intention in health care provider choice: A South Korean study," *Journal of Business Research*, Vol. 57 No. 8:913-921, 2004.

Compeau, D. R. and C. A. Higgins, "Computer self-efficacy: Development of a measurement and initial test," *MIS Quarterly*, Vol. 19 No. 2:189-211, 1995.

Cronin, J. J. Jr., M. K. Brady and G. T. M. Hult, "Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments," *Journal of Retailing*, Vol. 76 No. 2:193-218, 2000.

Demerouti, E., A. B. Bakker, F. Nachreiner and W. B. Schaufeli, "The job demands–resources model of burnout," *Journal of Applied Psychology*, Vol. 86 No. 3:499-512, 2001.

Fang, E. "Customer participation and the trade-off between new product innovativeness and speed to market," *Journal of Marketing*, Vol. 72 No. 4:90-104, 2008.

Fornell, C. and D.F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, Vol. 18 No. 1:39-50, 1981.

Gangadharbatla, H. "Facebook me: Collective self-esteem, need to belong, and internet self-efficacy as predictors of the iGeneration's attitudes toward social networking sites," *Journal of Interactive Advertising*, Vol. 8 No. 2:5-15, 2008.

Habibi, M.R., M. Laroche and M.O. Richard, "The roles of brand community and community engagement in building brand trust on social media," *Computers in Human Behavior*, Vol. 37:152-161, 2014.

Hair, J. F., W.C. Black, B.J. Babin, R.E. Anderson and R.L. Tatham, Multivariate Data Analysis (Vol. 6), Upper Saddle River, NJ: Pearson Prentice Hall, 2006.

Hair, J.F., M. Sarstedt, C.M. Ringle and J.A. Mena, "An assessment of the use of partial least squares structural equation modeling in marketing research," *Journal of the Academy of Marketing Science*, Vol. 40 No. 3:414-433, 2012.

Hennig-Thurau, T., K.P. Gwinner and D.D. Gremler, "Understanding relationship marketing outcomes an integration of relational benefits and relationship quality," *Journal of Service Research*, Vol. 4 No. 3:230-247, 2002.

Hennig-Thurau, T., K.P. Gwinner, G. Walsh and D.D. Gremler, "Electronic word-of-mouth via consumer-opinion platforms: What motivates consumers to articulate themselves on the Internet?," *Journal of Interactive Marketing*, Vol. 18 No. 1:38-52, 2004.

Henseler, J., C.R. Ringle and R.R. Sinkovics, "The Use of Partial Least Squares Path Modeling in International Marketing,'' *Advances in International Marketing*, Vol. 20:277-319, 2009.

Hirschman, A.O., Exit, voice, and loyalty: Responses to decline in firms, organizations and states, CAM: Harvard University Press, 1970.

Hsu, M.H., T.L., Ju, C. H. Yen and C. M. Chang, "Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations," *International Journal of Human-Computer Studies*, Vol. 65 No. 2:153-169, 2007.

Huang, H-Y. and S-P. Shih, "Remaining current social network sites: An unconscious and conscious perspective," *Journal of Electronic Commerce Research*, Vol. 20 No. 2: 118-140, 2019.

Igbaria, M., S. Parasuraman and M.K. Badawy, "Work experiences, job involvement, and quality of work life among information systems personnel," *MIS Quarterly*, Vol. 18 No. 2:175-201, 1994.

Jaakkola, E. and M. Alexander "The role of customer engagement behavior in value co-creation: A service system perspective," *Journal of Service Research*, Vol. 17 No. 3:247-261, 2014.

Jang, H., L. Olfman, J. Koh and K. Kim, "The influence of online brand community characteristics on community commitment and brand loyalty," *International Journal of Electronic Commerce*, Vol. 12 No. 3:57-80, 2008.

Kamis, A., M. Koufaris and T. Stern, "Using an attribute-based decision support system for user-customized products online: an experimental investigation," *MIS Quarterly*, Vol. 32 No. 1:159-177, 2008.

Kaplan, A. M. and M. Haenlein, M. "Users of the world, unite! The challenges and opportunities of Social Media," *Business Horizons*, Vol. 53 No. 1:59-68, 2010.

Kim, D., "Under what conditions will social commerce business models survive?," *Electronic Commerce Research and Applications*, Vol. 12 No. 2:69-77, 2013.

Kim, Y.H., D.J. Kim and K. Wachter, "A study of mobile user engagement (MoEN): Engagement motivations, perceived value, satisfaction, and continued engagement intention," *Decision Support Systems*, Vol. 56:361-370, 2013.

Kolb, D.G., "Exploring the metaphor of connectivity: Attributes, dimensions and duality," *Organization Studies*, Vol. 29 No. 1:127-144, 2008.

Ko, H.C., "The determinants of continuous use of social networking sites: An empirical study on Taiwanese journal-type bloggers' continuous self-disclosure behavior," *Electronic Commerce Research and Applications,* Vol. 12 No. 2:103-111, 2013.

Ku, Y.C., R. Chen and H. Zhang, "Why do users continue using social networking sites? An exploratory study of members in the United States and Taiwan," *Information & Management*, Vol. 50 No. 7:571-581, 2013.

Kuo, Y. F. and J. R. Hou., "Oppositional brand loyalty in online brand communities: perspectives on social identity theory and consumer-brand relationship," *Journal of Electronic Commerce Research*, Vol. 18 No. 3: 254-268, 2017.

Kumar, V., L. Aksoy, B. Donkers, R. Venkatesan, T. Wiesel and S. Tillmanns "Undervalued or overvalued customers: Capturing total customer engagement value," *Journal of Service Research*, Vol. 13 No. 3:297-310, 2010.

Labrecque, L.I., C. Mathwick, T.P. Novak and C.F. Hofacker, "Consumer power: Evolution in the digital age," *Journal of Interactive Marketing*, Vol. 27 No. 4:257-269, 2013.

Laroche, M., M.R. Habibi, M.O. Richard and R. Sankaranarayanan, "The effects of social media based brand communities on brand community markers, value creation practices, brand trust and brand loyalty," *Computers in Human Behavior*, Vol. 28 No. 5:1755-1767, 2012.

Lee, J. "The effects of knowledge sharing on individual creativity in higher education institutions: socio-technical view," *Administrative Sciences*, Vol. 8 No. 2, 2018.

Lee, M. K., C.M. Cheung, K.H. Lim and C.L. Sia, "Understanding customer knowledge sharing in web-based discussion boards: An exploratory study," *Internet Research*, Vol. 16 No. 3:289-303, 2006.

Liang, T.P., Y.T. Ho, Y.W. Li and E.E. Turban, "What drives social commerce: the role of social support and relationship quality," *International Journal of Electronic Commerce*, Vol. 16 No. 2:69-90, 2011.

Liao, C.H., "Does organizational citizenship behavior add value to human interaction with e-services?," *Online Information Review*, Vol. 39 No. 4:485-504, 2015.

Lin, C.S., S. Wu and R.J. Tsai, "Integrating perceived playfulness into expectation-confirmation model for web portal context," *Information & Management*, Vol. 42 No. 5:683-693, 2005.

Lindell, M.K. and D.J. Whitney. "Accounting for common method variance in cross-sectional research designs," *Journal of Applied Psychology*, Vol. 86 No.1: 114-121, 2001.

Liu, J., O. L. Siu and K. Shi, "Transformational leadership and employee well-being: The mediating role of trust in the leader and self-efficacy," *Applied Psychology*, Vol. 59 No. 3:454-479, 2010.

Lowry, P.B., J. Gaskin and G.D. Moody, "Proposing the multi-motive information systems continuance model (MISC) to better explain end-user system evaluations and continuance intentions," *Journal of the Association for Information Systems*, Vol. 16 No. 7:515-579, 2015.

Lu, Y. and R. Ramamurthy "Understanding the link between information technology capability and organizational agility: An empirical examination," *MIS Quarterly*, Vol. 35 No. 4: 931-954, 2011.

Luarn, P. and H.H. Lin, "Toward an understanding of the behavioral intention to use mobile banking," *Computers in Human Behavior*, Vol. 21 No. 6:873-891, 2005.

Lundkvist, A. and A. Yakhlef, "Customer involvement in new service development: a conversational approach," *Managing Service Quality: An International Journal*, Vol. 14 No. 2/3:249-257, 2004.

McAlexander, J. H., J. W. Schouten and H. F. Koenig, "Building brand community," *Journal of Marketing*, Vol. 66 No. 1:38-54, 2002.

Mohammad, J., F. Quoquab, R. Thurasamy and M.N. Alolayyan, "The effect of user-generated content quality on brand engagement: The mediating role of functional and emotional values," *Journal of Electronic Commerce Research*, Vol. 21 No. 1: 39-55, 2020.

Moon, J-W. and Y-G. Kim, "Extending the TAM for a World-Wide-Web context," *Information & Management*, Vol. 38 No. 4:217-230, 2001.

Mumford, E. "The story of socio- technical design: Reflections on its successes, failures and potential," *Information Systems Journal*, Vol. 16 No. 4:317-342, 2006.

Muniz Jr, A.M. and T.C. O'guinn, "Brand community," *Journal of Consumer Research*, Vol. 27 No. 4:412-432, 2001.

Nambisan, S., "Designing virtual customer environments for new product development: Toward a theory," *Academy of Management Review*, Vol. 27 No. 3:392-413, 2002.

Oreg, S. and O. Nov, "Exploring motivations for contributing to open source initiatives: The roles of contribution context and personal values," *Computers in Human Behavior*, Vol. 24 No. 5:2055-2073, 2008.

Pavlou, P.A., "Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model," *International Journal of Electronic Commerce*, Vol. 7 No. 3:101-134, 2003.

Rapp, A., L.S. Beitelspacher, D. Grewal and D.E. Hughes, "Understanding social media effects across seller, retailer, and consumer interactions," *Journal of the Academy of Marketing Science*, Vol. 41 No. 5:547-566, 2013.

Rishika, R., A. Kumar, R. Janakiraman, R. and R. Bezawada, "The effect of customers' social media participation on customer visit frequency and profitability: An empirical investigation," *Information Systems Research*, Vol. 24 No. 1:108-127, 2013.

Roca, J.C. and M. Gagne´, "Understanding e-learning continuance intention in the workplace: A self-determination theory perspective," *Computers in Human Behavior*, Vol. 24 No. 4:1585-1604, 2008.

Rönkkö, M. and J. Ylitalo, "PLS marker variable approach to diagnosing and controlling for method variance," *32th International Conference on Information Systems, Shanghai*, 2011.

Salanova, M., S. Agut and J.M. Peiro´, "Linking organizational resources and work engagement to employee performance and customer loyalty: the mediation of service climate," *Journal of Applied Psychology*, Vol. 90 No. 6:1217-1227, 2005.

Sarker, S., S. Chatterjee, X. Xiao and A. Elbanna, "The sociotechnical axis of cohesion for the IS discipline: Its historical legacy and its continued relevance," *MIS Quarterly*, Vol. 43 No. 3: 695-719, 2019.

Sashi, C.M., "Customer engagement, buyer-seller relationships, and social media," *Management Decision*, Vol. 50 No. 2:253-272, 2012.

Schmitt, P., B. Skiera and C. Van den Bulte, "Referral programs and customer value," *Journal of Marketing*, Vol. 75 No. 1:46-59, 2011.

See-To, E. W. and K. K. Ho, "Value co-creation and purchase intention in social network sites: The role of electronic Word-of-Mouth and trust–A theoretical analysis," *Computers in Human Behavior*, Vol. 31:182-189, 2014.

Shen, Y.C., C.Y. Huang, C.H., Chu and H.C. Liao, "Virtual community loyalty: An interpersonal-interaction perspective," *International Journal of Electronic Commerce*, Vol. 15 No. 1:49-74, 2010.

Shih, H. P., "Assessing the effects of self-efficacy and competence on individual satisfaction with computer use: An IT student perspective," *Computers in Human Behavior*, Vol. 22 No. 6:1012-1026, 2006.

Simmering, M.J., C.M. Fuller, H.A. Richardson, Y. Ocal, and G.M. Atinc "Marker variable choice, reporting, and interpretation in the detection of common method variance: A review and demonstration," *Organizational Research Methods*, Vol. 18 No. 3: 473-511, 2015.

Stewart, D.W. and P.A. Pavlou, "From consumer response to active consumer: Measuring the effectiveness of interactive media," *Journal of the Academy of Marketing Science*, Vol. 30 No. 4:376–396, 2002.

Thompson, E.R. and F.T. Phua, "Reliability among senior managers of the Marlowe–Crowne short-form Social Desirability Scale," *Journal of Business and Psychology*, Vol. 19 No. 4:541-554, 2005.

Trist, E., The evolution of sociotechnical systems as a conceptual framework and as an action research program, in A. Van de Ven and W. Joyce (Eds.), *Perspectives on organization design and behavior*, Wiley, New York, 19-75, 1981.

van der Heijden, H., "User acceptance of hedonic information systems," *MIS Quarterly*, Vol. 28 No. 4:695-704, 2004.

van Doorn, J., K.N. Lemon, V. Mittal, S. Nass, D. Pick, P. Pirner and P.C. Verhoef, "Customer engagement behavior: theoretical foundations and research directions," *Journal of Service Research*, Vol. 13 No. 3:253-266, 2010.

Vatanasombut, B., M. Igbaria, A. C. Stylianou and W. Rodgers, "Information systems continuance intention of web-based applications customers: The case of online banking," *Information & Management*, Vol. 45 No. 7:419-428, 2008.

Venkatesh, V., J. Y. Thong and X. Xu, "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology," *MIS Quarterly*, Vol. 36 No. 1:157-178, 2012.

Verleye, K., P. Gemmel and D. Rangarajan, "Managing engagement behaviors in a network of customers and stakeholders evidence from the nursing home sector," *Journal of Service Research*, Vol. 17 No. 1:68-84, 2014.

Vivek, S.D., S.E. Beatty and R.M. Morgan, "Customer engagement: Exploring customer relationships beyond purchase," *Journal of Marketing Theory and Practice*, Vol. 20 No. 2:122-146, 2012.

Wan, J., Y. Lu, B. Wang and L. Zhao, "How attachment influences users' willingness to donate to content creators in social media: A socio-technical systems perspective," *Information & Management*, Vol. 54 No.7: 837-850, 2017.

Wasko, M.M. and S.S. Faraj, "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice," *MIS Quarterly*, Vol. 29 No. 1:35-57, 2005.

Webster, J., L. K. Trevino and L. Ryan, "The dimensionality and correlates of flow in human-computer interaction," *Computers in Human Behavior*, Vol. 9 No. 4:411-426, 1993.

Xu, J. D., I. Benbasat and R.T. Cenfetelli, "Integrating service quality with system and information quality: an empirical test in the e-service context," *MIS Quarterly*, Vol. 37 No. 3:777-794, 2013.

Zeithaml, V. A., L.L. Berry and A. Parasuraman, "The behavioral consequences of service quality', *Journal of Marketing*, Vol. 60 No. 2:31-46, 1996.

Appendix

Appendix A. Questionnaire items

Construct	Item	Source
Interaction with Social Media		
Competence	AP1: I can apply my skills and techniques in this SNBC.	
	AP2: I can leverage my innovation and judgment in this SNBC.	Adapted from
	AP3: I can apply my ability in this SNBC.	Shih [2006]
	AP4: I can apply my profession in this SNBC.	
Feedback	AF1: I know other's replies after posting.	Adapted from
	AF2: I can see my performance after posting.	Ko [2013]
	AF3: I know the influence from the company or others after posting.	
Playfulness	PL1: This __ SNBC is interesting.	Adapted from
	PL2: This __ SNBC is fun.	Xu et al. [2013]
	PL3: This __ SNBC is pleasant.	
Interaction with social members		
Customer-to-Product relationship	CP1: I love this branded product.	Adapted from
	CP2: I am proud of this branded product.	Habibi et al.
	CP3: This branded product is one of my favorite possessions.	[2014]
Customer-to-Brand relationship	CB1: I cherish the heritage of this brand.	
	CB2: If I were to replace the product, I would replace it with another product of the same brand.	Adapted from Habibi et al.
	CB3: This brand is of the highest quality.	[2014]
	CB4: I would recommend this brand to my friends.	
Customer-to-Company relationship	CC1: ___ company understands my needs.	
	CC2: ___ company cares about my opinions.	Adapted from
	CC3: I feel ___ company cares a lot about its customers.	Habibi et al.
	CC4: I feel ___ company takes my feedback seriously.	[2014]
	CC5: I feel ___ company shares information with me.	
Customer-to-Other customers relationship	CO1: I share similar values with other members of this SNBC.	
	CO2: I participated in this SNBC for the same purpose as other community members.	Adapted from Shen et al.
	CO3: I share similar interests with other members of this SNBC.	[2010]
	CO4: I share similar preferences with other members of this SNBC.	
Continuance intention	CI1: I intend to continue using this SNBC rather than discontinue its use.	
	CI 2: I plan to keep using this SNBC in the future.	
	CI 3: I will revisit this SNBC.	Adapted from
	CI 4: I intend to continue using this SNBC in the future.	Liang et al. [2011], Ku et al.
	CI 5[*]: My intention is to continue using this SNBC rather than using another SNBC.	[2013]
	CI 6[*]: If I could, I would like to discontinue my use of this SNBC.	
Customer engagement behavior	EB1: I spent a lot of time here.	Developed
	EB2: I tell my friends the information I get here.	from the
	EB3: I tell the firm what I need.	concept of CEB
	EB4: I reply to questions from other members.	by Kumar et al.
	EB5: I recommend this brand to my friends.	[2010]

Note: CI5 and CI 6 were deleted during the pre-test and CI 6 was a reverse question.

Appendix B. Test for common method variance (marker variable)

path significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

support ----▶ not support