Full length article

Assessing flow experience in social networking site based brand communities

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ABSTRACT

The sustenance of the Social Networking Site (SNS)-based brand communities relies on user retention and their active participation. Therefore, understanding the intrinsic aspects of user behavior in such communities is important for devising strategies to ensure user retention and active participation. Especially, information about the elements that induce flow experiences—the intrinsically enjoyable and immersive experiences—of users in SNS has become important for organizations that host online communities. In our empirical study, we chose to focus especially on SNS-based brand communities, as they are increasingly interesting from an organization-community interaction perspective, but they lack the instruments needed for measuring user experience. The present study addresses this gap by developing an instrument aimed at measuring the user's flow experience on SNS-based brand communities. A cross-sectional survey with 577 Facebook brand community users was carried out. The findings show that enjoyment, concentration, and social interaction are the components that constitute a user's flow experience. In addition to providing a valuable tool for business practitioners, the developed instrument offers several theoretical and practical implications for improving user experience of social media.

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1. Introduction

Social Networking Services (SNS) have brought about significant changes in the communication practices of individuals and organizations. However, the impact of SNS on the social as well as personal well-being of people has been relatively well studied (Dhir, Kaur, Lonka, & Nieminen, 2016; Dhir & Torsheim, 2016; Dhir, Pallesen, Torsheim, & Andreassen, 2016) compared to that on organizations. Recent research suggests that the use of SNS has made it possible to maintain continuous interaction among participants of an interest group or a company-hosted community (Kaur, Dhir, Chen, & Rajala, 2016b). In addition to this, SNS has begun to influence the communication patterns of organizations that need synchronous interaction across different time zones and geographical boundaries (Kaur, 2016a,b). The increasing number of

users on SNS is encouraging organizations to establish a presence in online communities. For example, a report by Infographics (2012) showed that 80% of the studied businesses were present on Facebook. Moreover, organizations understand the importance of involving users in organizational processes, especially when dealing with innovating new products and services (Buur & Matthews, 2008; Füller, Matzler, & Hoppe, 2008; Kaur, 2016a; Von Hippel, 2005). This research shows that presence on different SNS actually helps organizations to enhance brand attractiveness, thus promoting their offerings for potential users, establishing closer ties with existing customers, empowering customers by providing them with a platform to express their concerns, and gathering ideas and feedback (Lin & Lu, 2011). In other words, SNS-based brand communities appear to be lucrative platforms for practicing user-centric service innovation.

Brand communities in the online environment have a long and extensive research history. A brand community is defined as a "specialized, non-geographically bound community, … based on a structured set of social relations among admirers of a brand" (Muniz & O'Guinn, 2001). In comparison, SNS-based brand communities are a relatively recent concept as a specific case of brand

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communities established on social media platforms (Habibi, Laroche, & Richard, 2014b; Laroche, Habibi, Richard, & Sankaranarayanan, 2012), which have experienced tremendous growth in the past few years. The growing popularity of SNS-based brand communities has attracted researchers from a variety of disciplines. Most of the existing work is focused on brand loyalty, brand trust, and the characteristics of SNS-based communities (Habibi, Laroche, & Richard, 2014a; Kang, Tang, & Fiore, 2014; Laroche et al., 2012). Despite the popularity of SNS-based brand communities as a research subject, the crucial questions concerning user retention and active user participation remain unanswered.

The present study applies the theory of flow experience (Csikszentmihalyi & Csikszentmihalyi 1988; 1990) to investigate the open challenge of user retention and user participation faced by SNS-based brand communities. Flow theory is a popular theoretical framework which is defined as "*the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it*" (Csikszentmihalyi, 1990, p. 4). The existing research has shown flow theory to be a valuable framework for investigating user behavior (Chang & Zhu, 2012; Novak, Hoffman, & Yung, 2000). Moreover, the flow theory framework is considered especially relevant for examining voluntary user behavior (Csikszentmihalyi, 1990). In essence, user participation and continued use of SNS are forms of voluntary behavior. Prior research has suggested that flow experience can influence users' decisions associated with voluntary behavior such as continuation and loyalty intentions among users in different contexts (Chang & Zhu, 2012; Hsu & Lu, 2004; Zhou, Li, & Liu, 2010). Hence, an understanding of the elements that can provide flow experience to the users on SNS-based brand communities can be considered as key factors affecting enhanced user participation or user retention. Interestingly, the existing research concerning flow experience in the SNS context has focused mainly on the continuation intention (Chang, 2013; Chang & Zhu, 2012; Wu & Wang, 2011), loyalty (Qi & Fu, 2011; Zhou et al., 2010), interaction, and interpersonal relationships (Kwak, Choi, & Lee, 2014). Consequently, existing research has not paid sufficient attention to the development of instruments for measuring flow experience that can be used in the SNS context. To address this open research gap, the present study has developed a psychometrically valid and reliable measurement instrument aimed at evaluating the flow experience of users, particularly in the SNS-based brand communities.

2. Background literature

The emergence of Web 2.0 has given birth to new forms of online brand communities on a variety of social media platforms. The arrival of such platforms has also transformed users from passive to active entities. For example, SNS-based brand communities have made users more frank, and they are now expressing themselves openly using their real identities rather than their prior preferred communication mode of using pseudonyms (Habibi et al., 2014b; Zaglia, 2013). As previously mentioned, SNS-based brand communities bring several benefits for organizations such as the formulation of positive purchase intentions, the development of brand loyalty, connection with a large customer base in a fast and cost-efficient manner, possibilities of contact with potential customers, customer feedback on existing offerings, ideas for potential future offerings, and evaluation of existing services, practicing co-creation and user-centric service innovation (Algesheimer, Dholakia, & Herrmann, 2005; Habibi et al., 2014b; Laroche et al., 2012; Lin & Lu, 2011; Schau, Muniz, & Arnould, 2009; Von Hippel, 2005). Most recent of all, Habibi et al. (2014b) have found

that Facebook-based brand communities facilitate value creation practices. Habibi et al. (2014b) utilized a netnography approach on the Jeep and Harley-Davidson communities to explore the details of SNS-based brand communities. The main purpose of their study was to understand the differences and similarities between the SNS-based brand communities and the original conceptualization of brand communities. They found that the SNS-based brand communities also possess three markers of shared consciousness, shared rituals, and traditions and obligations to society similar to the original brand community conceptualization. On the other hand, the SNS-based brand communities also differ from brand communities in terms of (i) presence of social context, (ii) lack of established structure, (iii) enormous variations in size, with the ability to accommodate millions of users, (iv) the ability to establish connections with other affiliated brand communities, and (v) an attractive interaction pattern of storytelling.

2.1. SNS-based brand communities

Prior research on SNS-based brand communities addressed different dimensions including brand loyalty (Ho, 2014; Kang et al., 2014; Laroche, Habibi, & Richard, 2013; Zheng, Cheung, Lee, & Liang, 2015), fan page loyalty (Chen, Papazafeiropoulou, Chen, Duan, & Liu, 2014; Ruiz-Mafe, Martí Parreño, & Sanz-Blas, 2014), brand trust (Habibi et al., 2014a; Kang et al., 2014; Laroche et al., 2013), brand experience (Chen et al., 2014), engagement (Cvijikj & Michahelles, 2013; Gummerus, Liljander, Weman, & Pihlström, 2012), content (Smith, Fischer, & Yongjian, 2012; Yu, 2014), user behavior (Kabadayi & Price, 2014), continuation intention (Lin & Lu, 2011), intention to join (Muk & Chung, 2014), value creation practices (Laroche et al., 2012), and the customer's relationship with the company, brand, product, and other customers (Laroche et al., 2013). Interestingly, the majority of the prior literature has addressed brand communities established on the Facebook platform.

Brand loyalty and brand trust are among the significant research streams in the literature on SNS-based brand communities (Chen et al., 2014; Habibi et al., 2014a; Ho, 2014; Kang et al., 2014; Laroche et al., 2013, 2012; Zheng et al., 2015). Research on brand loyalty has been carried out using different theoretical frameworks. Laroche et al. (2012) used community markers and value creation practices, while Laroche et al. (2013) used a customer-centric model. These studies have successfully demonstrated that social media brand communities influence brand loyalty. Similarly, Zheng et al. (2015) investigated brand loyalty through the constructs of community commitment and user engagement. Their findings suggest that user engagement and community engagement influence brand loyalty. The user's engagement is positively defined by his/her perceptions of the benefits.

The concept of brand loyalty has also been examined using different terminologies (e.g., brand commitment, citizenship behavior). The study by Kang et al. (2014) investigated brand commitment through the lens of functional, socio-psychological, hedonic, and monetary benefits. The findings suggest that brand commitment and brand trust are predicted by active participation. The active participation of users is influenced by only hedonic and social-psychological benefits. Similarly, Ho (2014) examined users' citizenship behavior (or voluntary behavior) as in-role (e.g., purchasing or purchase intention) and ex-role (e.g., word of mouth, continuation intention) in Facebook-brand communities. The study findings suggest that loyalty is affected by users' participation, brand trust, and community identification. However, brand trust is found to exert a stronger influence on in-role user behavior, while community identification has greater influence on ex-role user behavior.

In addition to loyalty toward brand, the research also examined users' loyalty toward SNS-based brand communities. The study by Ruiz-Mafe et al. (2014) investigated different factors affecting a user's loyalty to Facebook fan pages. The findings suggest that trust, dependency on the content provided by the fan page, attitude, and perceived usefulness all predict a user's loyalty to Facebook fan pages. The user's attitude that was found to have the greatest impact on loyalty is determined by trust, content dependency, perceived ease of use, and perceived usefulness. Similarly, the study by Chen et al. (2014) found that users' brand experience positively influences their loyalty to Facebook pages and their tendency to provide electronic word of mouth recommendation. Furthermore, the study has shown empirically that users' intrinsic motivations (e.g., brand love) and extrinsic motivations (e.g., perceived ease of use, perceived usefulness, and customer effort) influence their brand experience.

The research on brand loyalty has not investigated its direct relationship with the considered theoretical frameworks. For example, Laroche et al. (2012, 2013), and Kang et al. (2014) examined brand loyalty via brand trust, value creation practices, and customer relationships with different entities (e.g., brand, product, company, and other customers) and active participation. Brand trust is found to have a positive influence on brand loyalty. Concerning brand loyalty, brand trust is found to have a significant positive relationship with all forms of customer relations (Laroche et al., 2013). On the contrary, small variations were found while investigating the impact of different forms of a customer's relationship with brand trust with community engagement as the moderator (Habibi et al., 2014a).

Gummerus et al. (2012) investigated the customer engagement phenomenon on Facebook-based brand communities in the context of satisfaction and loyalty. It was found that customer engagement exerts a positive influence on social, entertainment, and economic benefits. However, the mediation analysis results reveal that the different relationship benefits generate varied effects on satisfaction and loyalty. For example, social benefits cause a negative effect on satisfaction while entertainment benefits lead to a positive impact. Cvijikj and Michahelles (2013) suggested different ways to enhance user engagement in Facebook-based brand communities. For example, provision of informative and entertaining content, increasing the vividness but decreasing the interactivity in the provided content, and using image as the interaction media type, avoiding content posting during peak hours, etc. Furthermore, their study suggested that commenting is the most favored form of compensation for users' efforts in Facebook-based brand communities.

Kabadayi and Price (2014) investigated users' engagement behavior (via liking and commenting) from the perspective of personality traits and interaction modes. The study findings suggest that personality traits influence a user's preference for interaction modes. For example, extroverted users have a preference for broadcasting rather than communication as the interaction mode. On the other hand, neurotic users are more attracted to communication as a mode of interaction rather than broadcasting. The information on interaction modes and personality traits can help instigate engaging behavior among users. For example, users who prefer the broadcasting mode tend to like and comment more, while users preferring the communication interaction mode tend to like more and refrain from commenting. In general, it can be stated that the broadcasting interaction mode is more useful for encouraging engaging behavior among users on Facebook.

Lin and Lu (2011) investigated different factors that could motivate users to continue using Facebook fan pages. The authors found that all three dimensions of social capital theory predict users' intentions to continue using Facebook fan pages. Specifically, they found that social interaction, shared values and trust anticipate users' continuation intentions. Similarly, Muk and Chung (2014) investigated different factors that can motivate users to join the Facebook brand or fan pages from the perspective of the gratification derived by users from social network advertising. The authors found that hedonic and utilitarian values derived from social network advertising influence a user's attitude. However, it was found that users' perceive utilitarian value to be more important than hedonic value in formulating a positive attitude toward joining social network brand pages. Additionally, subjective norms are also found to influence users' joining intention.

2.2. Flow instrument literature

The flow experience theory has been in existence for approximately four decades. During this time period, there have been a number of attempts to develop instruments for measuring users' flow experience (Agarwal & Karahanna, 2000; Bakker, 2008; Csikszentmihalyi & Csikszentmihalyi 1988; Jackson & Eklund, 2002; Jackson, Kimiecik, Ford, & Marsh, 1998; Jackson, Martin, & Eklund, 2008; Jackson & Marsh, 1996; Jackson & Roberts, 1992; Webster, 1989). On the other hand, the existing literature also consists of attempts to validate and adapt these developed instruments in the same or different contexts (Davis & Wiedenbeck, 2001; Delle Fave, Massimini, & Bassi, 2011; Guo & Poole, 2009; Kiili, 2006; Schaik & Ling, 2003, 2007, 2012a, 2012b). The developed instruments and their validations are available in different languages (e.g., English, German, Spanish, Japanese, Italian, Portuguese, and French) and address different contexts (e.g., physical activity, voluntary activity, gaming, work, web navigation, worldwide web, online shopping, playfulness, etc.).

The prior developed instruments and their validations suffer from various limitations. First, the majority of the instruments were developed nearly two decades ago (Agarwal & Karahanna, 2000; Csikszentmihalyi & Csikszentmihalyi, 1988; Davis & Wiedenbeck, 2001; Jackson & Marsh, 1996; Webster, 1989). Hence, they require updating and revision. Second, many of the proposed instruments were developed in contexts other than information systems. For example, the different long and short instruments developed by Jackson and Roberts (1992); Jackson and Marsh (1996); Jackson et al. (1998); Jackson and Eklund (2002); Jackson et al. (2008) address the domain of physical activity. However, they have been adapted to be used in information system domains for assessing users' flow experience (Guo & Poole, 2009; Kiili, 2006). Third, the development of prior scales has been done based on small sample sizes (Agarwal & Karahanna, 2000; Davis & Wiedenbeck, 2001; Magyaródi, Nagy, Soltész, Mózes, & Oláh, 2013; Webster, 1989). Fourth, the existing scales' developments and validations lack sufficient reporting of their psychometric properties. The majority of the research has only reported the Cronbach's alpha values. Finally, to the best of our knowledge, there has been no instrument especially developed for measuring the flow experience of SNS-based brand community users. However, there is a recently developed scale for measuring the flow experience in SNS of users with experience of SNS-based brand communities (Kaur et al., 2016b). However, this scale addresses the flow experience of SNS usage in general. On the other hand, the instrument developed in the present study specifically deals with the flow experience in SNS-based brand communities. To the best of our knowledge, there is no other available instrument for measuring flow experience of SNS-based brand community users.

2.3. Flow and SNS literature

Based on the examination of the existing statistics on Facebook

usage, Rauniar, Rawski, Yang, and Jonson (2014) found that a majority of the users spend one quarter of their time in online environments using social media applications. Additionally, the presence of billions of users on SNS platforms is worth investigating for the flow experience among SNS users (Hoffman & Novak, 2009). The research exploring such experience began around 2010, and to the best of our knowledge, consists of only seven studies (Chang, 2013; Chang & Zhu, 2012; Kaur et al., 2016b; Kwak et al., 2014; Qi & Fu, 2011; Wu & Wang, 2011; Zhou et al., 2010).

The existing flow experience research on SNS suffers from two main limitations: (i) incomplete flow theory conceptualization, and (ii) lack of clarity in terms of dimensionality of considered flow experience conceptualization. All the studies investigating flow theory in SNS have considered a limited set of constructs for measuring users' flow experience. For example, they have used enjoyment, concentration, control, telepresence, curiosity, time distortion, social interaction, and escape for measuring flow experience. However, these studies lack several constructs (e.g., balance of skill and challenge, unambiguous feedback, clear goals, loss of self-consciousness, playfulness, etc.) when compared with the original conceptualization of flow and other studies involving flow theory. Additionally, none of these studies offers a clear understanding of the dimensionality of flow. Some studies have considered flow as unidimensional (Chang, 2013; Chang & Zhu, 2012; Qi & Fu, 2011), while others have considered it to be a multidimensional concept (Kwak et al., 2014; Wu & Wang, 2011; Zhou et al., 2010). This might be creating a bias in the flow experience research in SNS contexts.

The aforementioned limitations generate the need for a reliable instrument for measuring a user's flow experience in SNS. As previously mentioned, there has been one attempt to develop an instrument for measuring flow experience for SNS in general (Kaur et al., 2016b). However, it is unknown if different functionalities of SNS can be investigated with the same instrument. The current paper attempts to develop and validate the extension of the prior developed flow experience instrument (Kaur et al., 2016b) with a particular focus on flow experience of SNS users in the context of SNS-based brand community users.

3. Research methods and data

3.1. Instrument development

The instrument proposed in this study is an extension of the flow-experience-measuring instrument addressing general SNS usage (Kaur, Dhir, Chen, & Rajala, 2016a). The previous study, consisting of 84 items representing 13 constructs, involved 804 Facebook users in 2013. The analysis resulted in a 26-item instrument with the following six dimensions: skill, machine interaction, social interaction, concentration, enjoyment, and playfulness. In contrast, the present study aimed to develop a flow experience instrument for measuring the flow experience of SNS-based brand community users. The prior pool of 26 items was complemented with 33 new items, thus formulating a pool of 59 items comprised of 10 constructs (see Table 1). The new constructs were added to the pool with the study context in mind. The newly added constructs were exploratory behavior, challenge, perceived ease of use, and intrinsic interest.

3.2. Participants and data collection

The data were collected from 577 students (aged 18–22 years with a mean age of 19.41 years) from two private universities in India. Participants were experienced users of Facebook-based brand communities. The study was conducted in December 2014.

The students were contacted through the management of their respective institution. The institution management was clearly informed about the study objectives, requirements, and expected outcomes. Upon receiving permission, the study was advertised to students through notice boards and announcements during lectures. The advertisement clearly mentioned the study details (e.g., objectives, expected outcomes, time requirements, and prerequisites for participation). The prerequisite for participation in the study was that the respondents should have experience of using Facebook-based brand communities. The study began with a brief introduction to Facebook-based brand communities, with the aim of ensuring that the participants' understanding of Facebook-based brand communities was aligned with that of the researchers.

Following this, the interested students were asked to complete pencil and paper surveys in the classroom or lecture environment. Anonymity of the participants was ensured, as suggested by the prior literature (Dhir, 2015, 2016), by giving clear instructions to the respondents to not reveal any identifying information (e.g., mobile number, name, or email address). Furthermore, the respondents had the freedom to quit the study whenever desired. Table 2 presents the descriptive statistics of the study participants. The survey was originally answered by 590 participants. A total of 11 participant entries were deleted, as they had more than 25% missing data. Additionally, one participant entry was deleted as the reported age was 42 years. This resulted in a total sample size of 577 for carrying out the analysis.

4. Results

The sample of 577 respondents was randomly split into two datasets, namely, Sample A (N = 269) and Sample B (N = 308). Sample A was employed for performing confirmatory factor analysis (CFA). On the other hand, Sample B was used for running second-order CFA.

4.1. Confirmatory factor analysis

The CFA of Sample A was performed using AMOS 21. The process of CFA involved several iterations: First, all standardized factor loadings below 0.50 were deleted. Second, instrument validation was examined by evaluating the convergent and discriminant validity of the developed instrument. The process was repeated until satisfactory results were obtained. This process resulted in a three-factor structure since it suggested a good model fit (X^2/df = 1.82, CFI = 0.97, TLI = 0.95, $RMSEA$ = 0.055) (Browne & Cudeck, 1993; Hu & Bentler, 1999; Kline, 2011) (see Table 3).

4.2. Second-order confirmatory factor analysis

The second-order CFA was performed in order to explore the presence of second-order factors, if any (Parasuraman, Zeithaml, & Malhotra, 2005; Wu, Tao, Yang, & Li, 2012). Second-order factors are considered as superior to first-order factors (Chen, Sousa, & West, 2005). The second-order CFA was performed since two important prerequisite conditions as suggested by Chen et al. (2005) were met. First, the retrieved first-order constructs have been used for measuring flow experience in the prior literature. Second, the correlations among the obtained first-order factors were within the recommended range of 0.28–0.67. This clearly provides evidence that the first-order factors (social interaction, concentration, and enjoyment) had the potential to be represented by the second-order factor of flow experience. The second-order factor resulted in a good model fit (X^2/df = 2.08; CFI = 0.97; TLI = 0.95; $RMSEA$ = 0.06). This shows that a single second-order latent factor titled "flow experience" represents the three first-

Table 1
Constructs of flow experience.

Constructs	Definition	Reference
Social interaction	The possibility to establish and maintain online social relationships with others on Facebook-based brand community users.	Wu & Wang, 2011
Playfulness	The users' experiential state derived by using Facebook-based brand communities.	Chou & Ting, 2003; Agarwal & Karahanna, 2000; Novak et al., 2000
Enjoyment	The users' personally pleasurable state is derived by using Facebook-based brand communities.	Ghani, Supnick, & Rooney, 1991; Wu & Wang, 2011; Agarwal & Karahanna, 2000
Concentration	The users' state of complete absorption in using Facebook-based brand communities.	Ghani et al., 1991; Wu & Wang, 2011, Moon & Kim, 2001
Skill	The ability of the users to use Facebook-based brand communities for performing their desired actions.	Novak et al., 2000; Koufaris, 2002
Machine interaction	The speed of users' interaction with Facebook-based brand communities.	Novak et al., 2000; Huang, 2003
Challenge	The users' perceptions of the level of difficulty of the activities on Facebook-based brand communities.	Novak et al., 2000
Exploratory behavior	The users' tendency to explore Facebook-based brand communities for satisfying their cognitive and emotional needs.	Novak et al., 2000; Chou & Ting, 2003
Perceived ease of use	The users' perceptions of the difficulty level of using Facebook-based brand communities.	Koufaris, 2002
Intrinsic interest	The users' internal concern and involvement with Facebook-based brand communities.	Huang, 2003

Table 2
Descriptive statistics of the participant demographic information.

Category	Item	Frequency	Percentage
Gender	Female	150	26.0
	Male	426	73.8
Age	18	98	17.0
	19	231	40.0
	20	176	30.5
	21	53	9.2
	22	18	3.1
Prior experience with Facebook-based brand communities	Less than 1 year	234	40.6
	Between 1 and 3 years	183	31.7
	More than 3 years	153	26.5

Table 3
First and second-order confirmatory factor analysis.

Factor name	Survey items	CFA (N = 269)	CFA (N = 308)	2nd order CFA (N = 308)
SI1	Using FBC enables me to develop relationships with others	0.74	0.59	0.59
SI2	Using FBC enables me to know new friends	0.82	0.84	0.84
SI3	FBC enables me to know new friends without embarrassment	0.62	0.67	0.67
E1	It is enjoyable to use FBC	0.63	0.64	0.64
E2	Using FBC keeps me happy throughout the day	0.67	0.85	0.85
E3	FBC gives me a lot of enjoyment	0.85	0.67	0.67
C1	I forget about my immediate surroundings when I use FBC	0.71	0.74	0.74
C2	I forget everything when I use FBC	0.81	0.87	0.87
C3	When using FBC, I never think about other things	0.64	0.73	0.73
C4	When using FBC, I am not aware of things happening around me	0.51	0.64	0.64
X^2/df	≤3.0	1.82	2.08	2.08
CFI	≥0.92	0.97	0.97	0.97
TLI	≥0.92	0.95	0.95	0.95
RMSEA	≤0.08	0.055	0.059	0.059

Note: FBC = Facebook-based brand communities.

order factors. It should be noted that enjoyment has the largest contribution (0.86) to flow experience. This is followed by concentration (0.60) and social interaction (0.53).

4.3. Validity and reliability

The examination of the validity and reliability of the developed instrument is considered significant for ensuring its genuineness and universal applicability (Dhir, 2015, 2016; Dhir, Chen & Nieminen, 2016). The validity of the developed 10-item instrument was established through the investigation of content, face, discriminant, convergent, and factorial validities. On the other hand, instrument reliability was assessed through construct reliability, internal consistency, and composite reliability.

Content validity was ensured by selecting the study constructs and their items from the existing literature. The chosen survey items have been previously validated in different domains and contexts. This provides evidence for the establishment of content validity.

Face validity was ensured by running a pilot study with twelve Facebook-based brand community users representing the target population. The final survey instrument was improved based on the feedback from the pilot study. The main corrections were due to the need to rephrase some of the questions so as to make them easier to

comprehend.

Discriminant validity was established by employing different recommended statistical measures suggested by the prior literature. First, the correlation value for all the pairs of the study constructs should be less than 0.80 (Campbell & Fiske, 1959). Second, average variance extracted (AVE) for all the constructs should be greater than the values of their corresponding average shared variance (ASV) and maximum shared variance (MSV) (Barclay, Higgins, & Thompson, 1995). Third, the correlation value for any study construct with others should not exceed the square root of the AVE values of the underlying construct (Chin, 1998; Fornell & Larcker, 1981). The developed instrument satisfies all three conditions, thus providing support for discriminant validity (see Table 4).

Convergent validity was established using three statistical tests. First, the value of composite reliability (CR) should be greater than or equal to 0.70 (Fornell & Larcker, 1981; Nunnally, 1978). Second, the AVE value of the study constructs should be greater than 0.50 (Hair, Black, Babin, Anderson, & Tatham, 2006). Third, the value of the item loadings should be greater than 0.50 (Anderson & Gerbing, 1988). The satisfaction of all of these three conditions supports the presence of convergent validity. (See Table 4).

Factorial validity examined the stability of the retrieved factor structure, which was investigated by plotting CFA on Sample B as well. Sample B also produced a three-factor structure with good model fit ($X^2/df = 2.08$, $CFI = 0.97$, $TLI = 0.95$, $RMSEA = 0.06$). This proves the presence of factorial validity for the developed instrument.

Instrument reliability assesses if the proposed scale possesses low measurement error. It was assessed using the following statistical tests (Cronbach, 1951). First, construct reliability was examined using Cronbach's alpha (α). The α value for all the study constructs was greater than the recommended threshold value of 0.70 (DeVellis, 2003; Nunnally, 1978). Second, internal consistency, which aims at establishing the internal reliability of the proposed scale, was examined by calculating the α value for the complete 10-item scale (Cronbach & Meehl, 1955; Nunnally & Bernstein, 1994). The proposed 10-item scale resulted in a good value of 0.80. Finally, CR was assessed, which is considered as a more robust measure of internal consistency (Raykov, 1998). As mentioned previously, all the study constructs resulted in CR values above the recommended threshold value of 0.70 (Fornell & Larcker, 1981; Nunnally, 1978). This shows that the study constructs and the instrument as a whole possess sufficient internal reliability. Thus, it can be concluded that the developed instrument fulfils the required criteria for establishing instrument reliability.

5. Discussion

Recent times have witnessed increased use of different SNS by organizations. The presence of billions of users on SNS is motivating organizations to establish their presence in online communities. Moreover, the SNS-based brand communities are potential platforms for improving user engagement and continued interaction as well as practicing user-centric service innovation. In addition to maintaining the reputation of a brand through its online presence, user participation on these platforms might provide organizations

with feedback regarding existing products and services, ideas regarding potential future products, and services and evaluation of currently ongoing developments. However, the success and sustenance of SNS-based brand communities relies on user retention and active participation. The present study aims to investigate this open challenge, which is faced by SNS-based brand communities.

In this study, we developed and validated a 10-item instrument for measuring the flow experience of SNS-based brand community users. The developed instrument can provide guidance on effectively practicing user-centric service innovation. In particular, it provides a systematic approach to instigating self-motivating behavior among SNS-based brand community users for continued association and participation. In addition, the findings of the present study cast new light on the questions of user engagement and retention in SNS communities. In particular, the findings indicate that, by providing intrinsically pleasurable and immersive experiences with increased opportunities for social interaction, it might be possible to induce flow experience among SNS-based brand community users.

5.1. Managerial implications

The use of SNS for a variety of communication and interaction purposes has gained immense popularity among organizations. In particular, SNS communities have been shown to be influential in supporting brand reputation. The instrument developed in this study offers several contributions for organizations interested in managing their brands in online communities. First, the instrument gives useful tips to the managers of Facebook-based brand communities for providing flow experience to the members of their brand communities. Second, increased understanding of the factors associated with intrinsic motivation can enable brand community managers to provide relevant content to their users. This can also motivate users to continue their association with the underlying brand community. Third, the findings of the present study highlight the importance of enjoyment for the users of Facebook-based brand communities. In this regard, the prior literature addressing users' continuation intention regarding Facebook has also suggested that the provision of enjoyable experience can drive users to stick with it (Chiu, Cheng, Huang, & Chen, 2013; Lin & Lu, 2011; Rauniar et al., 2014). Therefore, providing an enjoyable experience might also motivate users to continue their participation in SNS-based brand communities. This will also enable Facebook-based brand community managers to remain in contact with their existing user base. This is important since remaining in contact with existing and potential customers is one of the major motivations behind an organization's decision to establish its presence on different social media platforms.

In addition, the present study has implications for practitioners involved in user-centric service innovation, media research, human-computer interaction research, technology adoption, and continuation research, etc. In the context of user-centric service innovation, the present study provides a tool that might help to devise strategies for making Facebook-based brand communities more effective. It might also enable them to understand ways in which to channel user participation on Facebook-based brand

Table 4
Instrument validity and reliability.

	α	CR	AVE	MSV	ASV	Concentration	Social interaction	Enjoyment
Concentration	0.80	0.80	0.51	0.22	0.15	0.71		
Social interaction	0.75	0.76	0.51	0.20	0.14	0.28	0.72	
Enjoyment	0.76	0.76	0.52	0.22	0.21	0.47	0.45	0.72

Note: α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted; MSV = maximum shared variance; ASV = average shared variance.

communities. For example, the study findings reveal the importance of social interaction and impressiveness for engaging users in a self-motivating manner. In this regard, activities aimed at extracting useful information from users should also offer users the opportunities of knowing new like-minded people. For the other research domains, the present study findings can motivate them to develop instruments for measuring flow experience in their own field of research. In this regard, the present paper provides a step-by-step procedure for scale development. Young researchers and practitioners can employ this practice when developing scales in general or flow experience for their own research domain.

5.2. Theoretical implications

The present study has several theoretical implications. To begin with, it bridges the existing gap in the existing flow experience research. The research field of flow experience has evolved empirically and conceptually. However, the flow experience concept still faces limited understanding when compared with its original conceptualization. The majority of the existing literature provides an abstract level of understanding regarding the flow experience framework. However, researchers and practitioners need constructs and concepts to assess, measure, and evaluate flow experience in their studies. In addition to high-level conceptualization, the flow theory framework suffers from a lack of clarity and conventional measurement instruments.

Prior research involving flow experience frameworks is subject to the major limitation of lack of clarity regarding dimensionality. Some researchers have conceived flow experience to be unidimensional, while others have regarded it as a multidimensional concept (Finneran & Zhang, 2002; Hoffman & Novak, 2009). However, the original theory conceptualizes flow experience to be a multidimensional concept (Csikszentmihalyi, 1990). Moreover, the studies that have regarded flow experience as a multidimensional concept have cherry-picked constructs from earlier studies. The choice of constructs is based on the number of times the constructs have been considered in prior research. In some cases, additional constructs have also been added based on the context of the research (Wu & Wang, 2011). Additionally, there is also a need to make new instruments and validate existing instruments in the new contexts (e.g., user participation, SNS-based brand community contexts). The present study addresses these gaps to some extent. The present research further addresses these limitations by proposing an instrument that is based on the original multidimensional conceptualization of flow experience. As mentioned previously, the instrument has been made from the extensive list of constructs used for measuring flow experience in prior research on flow experience in information systems.

The majority of the prior studies have developed instruments based on low sample size (Agarwal & Karahanna, 2000; Davis & Wiedenbeck, 2001; Magyaródi et al., 2013; Webster, 1989). The current study overcomes this limitation by developing a flow experience instrument with 577 Facebook-based brand community users. Additionally, the existing literature has used flow experience instruments developed in different contexts adopted for the information system domain. For example, Guo and Poole (2009) used flow experience instruments developed in the context of physical activity to measure users' flow experience in the context of online shopping. The users' flow experience might, however, be different for different contexts. For example, Wu and Wang (2011) found that the new constructs of social interaction and escape constitute users' flow experience on SNS. Therefore, there is a need to develop instruments for measuring users' flow experience for specific contexts. This paper is perhaps the first attempt to develop an instrument for measuring the flow experience of SNS-based brand

community users.

The present study also addresses a long-pending demand to examine the SNS use behavior of SNS users based outside of the US (Dhir, Chen, & Chen, 2015; Dhir, et al., 2016; Kaur et al., 2016a,b). For example, prior Facebook-based research has overly focused on US-based users, but in reality over 82.4% of Facebook users actually reside outside of the US (Dhir, 2016). Finally, the present study also covers the limitation of lack of sufficient reporting of psychometric properties by the existing developments and validations of the flow experience instruments. This study provides clear information on all of the psychometric properties of the developed instrument.

6. Limitations and future work

The present study has some limitations which offer fruitful avenues for future work. First, the present study was undertaken in the context of Facebook-based brand communities. However, organizations have also established their existence on other social media platforms such as Twitter and YouTube, which have different patterns of use and demographic profiles of users. Hence, the findings of this study might not be applicable to brand communities established on other social media platforms. For example, Smith et al. (2012) pointed out the differences in terms of user-generated content among three popular social media networks (Facebook, YouTube, Twitter). Similarly, Wu, Wang, and Tsai (2010) suggested that flow experience constructs may vary for different platforms. This generates the need to validate the results of the current study in brand communities existing on other social media platforms. Second, the study was conducted on young Facebook-based brand community users (aged from 18 to 22 years) who might exhibit different behaviors and preferences as compared to the users of different age groups. Therefore, the proposed flow scale should be validated with users from different age groups, cultures, demographic groups, and geographical regions.

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