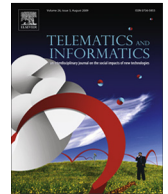


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The impact of online brand community characteristics on customer engagement: An application of Stimulus-Organism-Response paradigm

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ABSTRACT

The advent of interactive digital platforms has led people to progressively interact on such platforms, urging organizations to create online communities to engage customers with them and with each other to enhance brand loyalty. This study attempts to investigate what motivates customers to engage in these brand communities. Through a questionnaire survey of 430 Facebook users, this study investigates whether and how the unique characteristics (information quality, system quality, virtual interactivity, and rewards) of online brand communities affect customer engagement. The consequent effect of customer engagement on brand loyalty is also examined. This study frames and empirically validates a model for engaging customers with online brand communities on Facebook, considering the moderating role of gender. The Stimulus-Organism-Response paradigm is solicited to justify the theoretical background of this study. The data were analyzed using structure equation modelling. Results reveal that each of the characteristics positively influences customer engagement, with information quality and virtual interactivity bearing the strongest influence. Customer engagement also exhibits a strong positive impact on brand loyalty. This results further reveal that gender gap in the online environment is declining as the impact of all the four characteristics of online brand communities on customer engagement was invariable across male and female members.

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1. Introduction

Recent advances in interactive (digital) technologies have given rise to new platforms for information sharing and self-expression (Jang et al., 2008). People are progressively interacting on digital platforms to achieve personal as well as mutual objectives (Dholakia et al., 2004). As more people are becoming proficient with the Internet, organizations are creating online communities to engage customers with them and with each other. The online communities generally have a consumption activity or a brand as focal point. When a consumption activity is the focal point, the online community is termed as consumption community, signifying a group of individuals “held together through shared emotions, styles of life, new moral beliefs, senses of injustice and consumption practices” (Cova, 1997, p. 301), while when a brand is the focal point, the online community is labeled as brand community and is “an enduring, self-selected group of consumers, who accept and recognize bonds of membership with each other and the brand” (Veloutsou and Moutinho, 2009, p. 316).

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The rising popularity of online brand communities has offered a social platform for consumers to meet and share their experiences and enthusiasm regarding their preferred brands (Trusov et al., 2009; Zhu et al., 2016). With their unprecedented communicative and interactive capabilities, online brand communities warrant organizations to enhance brand awareness (Barreda et al., 2015), magnify trust (Nadeem et al., 2015), generate positive word of mouth (Wang et al., 2016), heighten customer brand loyalty (Zheng et al., 2015), and achieve competitive advantages while marketing their offerings (Jang et al., 2008).

The last decade has seen a thriving research interest with respect to online brand communities (Habibi et al., 2014; Islam and Rahman, 2016c; Zhang and Luo, 2016). The existing research in this domain has either focused on the brand-related outcomes of participation in an online brand community or on the interactions of consumers and their behavior in the online environment they operate in. The role of online brand communities in engaging customers, developing and strengthening customer relationship has also been of significant academic interest (Dessart et al., 2015; Manchanda et al., 2015). Many of the world's biggest brands have developed brand communities on Facebook to advertise, promote, and communicate their offerings to their customers, as well as engage them so as to build long-term customer-firm relationships (Zaglia, 2013).

Regardless of the extensive adoption of online brand communities and the organizational quest for engaging customers therein, scanty literature is available regarding what motivates customers to continuously interact on these communities (Baldus et al., 2015). To boost returns on the investments made in creating online brand communities, marketers require finer customer insights about the motivations to participate and engage in these brand communities and the resulting benefits (attitudinal and financial) to the brand. Better knowledge of the engagement motivations can help in achieving excellence by improving the operational standards for this advanced platform of brand communication. Because large number of customers spend time with online brand communities, it is worthwhile to explore customers' motivation in participating and engaging with them (Brodie et al., 2013; Baldus et al., 2015).

The urge for customer engagement research in online brand communities is extensively conceded in the marketing literature (Brodie et al., 2013; Hollebeek et al., 2014; Dessart et al., 2015). Marketing Science Institute (MSI) also recommends scholarly attention towards customer engagement (MSI, 2014). In the recent few years, research on customer engagement in the context of online brand communities has gained a significant heed (Dessart et al., 2015) but the empirical exploration in this domain is still underdeveloped (Brodie et al., 2013). Albeit this realistic need, research on the motivations of customer engagement in online brand communities has not kept pace with the ever changing scenario of the industry (Brodie et al., 2013). Earlier studies have emphasized the need to examine brand community characteristics and their impact on customer engagement (e.g., Brodie et al., 2013; De Valck et al., 2009) because these characteristics reflect a customer's overall impression of a brand community. A few studies have illustrated online brand community characteristics and their impact on satisfaction, commitment, and brand awareness (Barreda et al., 2015; Jang et al., 2008). However, studies exploring brand community characteristics and the paths through which these characteristics cause customer engagement are rare (Kang et al., 2016).

This study attempts to address this research gap by comprehensively examining some customer motivations to engage with online brand communities on Facebook and the resulting effect of customer engagement on brand loyalty. The current study is the first of its kind to conclusively investigate whether and how the unique characteristics (the building blocks) of online brand communities predict customer engagement. Furthermore, prior research suggests the exploration of the effects of gender differences on customer engagement in online brand communities (Cabra-Fierro et al., 2015; Hammadi et al., 2015) as consumer behavior is likely to differ across genders (Ruane and Wallace, 2013). In the social media contexts, gender analysis studies are at an early stage (Verbraken et al., 2014; Zhang et al., 2014). Therefore, considering the dearth of understanding regarding the moderating role of gender in relation to online brand communities, this study further analyzes how different genders (male and female) influence the relationship between key characteristics of online brand communities and customer engagement.

By addressing the above mentioned gaps, this paper makes significant contribution to the marketing literature as prior studies have not considered how prime characteristics of online brand communities influence customer engagement following interactions on them. Because customer engagement in the online context is initiated within social media applications (e.g., Facebook) via a website, this study specifically looks at some constructs that have frequently been cited within the website and brand community design literature. Characteristics such as information quality and system quality have been considered as imperative to incorporate while designing an effective company website (Cao et al., 2005; Hung and Lin, 2015; Ou and Sia, 2010), whereas interaction and rewards have been suggested to enhance satisfaction and brand awareness as well as generate favorable customer attitude towards online brand communities (Barreda et al., 2015; Jang et al., 2008; Mollen and Wilson, 2010). This study, therefore, studies the collective impact of these four key characteristics (information quality, system quality, virtual interactivity, and rewards) of online brand communities on customer engagement. The solicitation of Stimulus-Organism-Response paradigm and the empirical validation of the conceptual model in the context of Facebook, taking into account the gender differences, also adds to the contribution of this study as the findings of this study can be applied to different social media platforms such as Twitter, LinkedIn, and YouTube etc., which are appropriate for academic research.

The following section summarizes prior literature relevant to the constructs of this study and develops the conceptual framework and hypotheses. The methodology and data analysis to validate the conceptual framework is presented thereafter. The paper concludes by presenting the results, discussion and limitations of the study.

2. Theoretical development

2.1. Stimulus–Organism–Response framework

The Stimulus–Organism–Response (S–O–R) framework (Mehrabian and Russell, 1974) modified by Jacoby (2002) is employed as a theoretical base to support an integrative model proposed by the current study. The S–O–R framework proposes that certain features of an environment incite the cognitive and emotional state of an individual, which in turn drives some behavioral responses (Donovan and Rositer, 1982). The S–O–R framework has been extended to computer experience (Eroglu et al., 2003), advertising (Olney et al., 1991), website experience (Mollen and Wilson, 2010), and many other areas of consumer behavior (Rose et al., 2012; Reitz, 2012). Of importance to the current study, is the solicitation of S–O–R framework within the consumer behavior domain.

The S–O–R framework considers three elements viz. stimulus, organism, and response. The *stimulus* element is “the influence that arouses the individual” (Eroglu et al., 2001, p. 179). In the virtual environment, stimulus is the infrastructure of an online brand community and the set of its characteristics that influence the customers’ internal state (Mollen and Wilson, 2010). This study considers the characteristics (*information quality, system quality, virtual interactivity, and rewards*) of an online brand community to be the stimuli. The current study proposes that these characteristics exert significant effect on customer engagement with online brand communities.

The *organism* element of the S–O–R framework is the cognitive and affective intermediary state of the customers and it manifests the processes that intercede between the stimuli and customers’ responses (Loureiro and Ribeiro, 2011). Cognitive state represents customers’ mental processes and comprises of “everything that goes in the consumers’ minds concerning the acquisition, processing, retention, and retrieval of information” (Eroglu et al., 2001, p. 181). Affective state reflects the emotions like arousal and pleasure displayed by customers following the environmental stimuli. Once exposed to the stimuli, customers process the stimuli into information meaningful and helpful to them in making a decision (Loureiro and Ribeiro, 2011). Since cognition and affection are amongst the key dimensions of customer engagement, therefore, this study posits that customers’ engagement (an organism state) with the online brand communities will be influenced by the effect environmental cues (OBC characteristics) have on the customers’ interceding cognitive and affective states.

The *response* element of the S–O–R framework is the outcome in the form of customers’ approach or avoidance behaviors (Donovan and Rositer, 1982). Approach behaviors include the positive responses that are shown by the customers on specific settings in the form of purchasing and positive communications etc. whereas avoidance behaviors reflect the opposite responses such as negative communications and no intentions to purchase/stay etc. (Bitner, 1992; Eroglu et al., 2001). Given that the response can also be attitudinal, this study examines loyalty as a response of customer engagement in online brand communities.

2.2. Online brand communities and customer engagement

An online brand community is a “specialized, non-geographically bound community based on a structured set of social relations among admirers of a brand” (Muniz and O’Guinn, 2001, p. 412). Whether consumer or organization-initiated, an online brand community has some unique features. It has no geographical barriers (Wellman, 1979). It is developed around commercialized offerings (brands) shared by its members (Muniz and O’Guinn, 2001). It is somewhat stable; its members share a strong commitment with mutual goals and themes (Cova, 1997), they also have a high level of identity and understanding of the brand (Muniz and O’Guinn, 2001).

Organizations are motivated to expedite brand communities due to the fact that these communities carry out some valuable tasks related to the brand (Habibi et al., 2014). For example, customers on a brand community can be a strong source of product improvement and innovation (Fuller, 2010); they can help each other and fix each other’s problems regarding the brand, thereby, assisting the support service department of the firm (Schau et al., 2009). Customers can act as brand advocates in defending their favorite brands (Habibi et al., 2014) and also as evangelists to put attractive impressions on non-members (Schau et al., 2009).

Customers join and engage in brand communities to gain hedonic and utilitarian values from their participation in brand communities (Schau et al., 2009). By engaging in brand communities, customers gain pleasure by sharing their passion and also acquire the needed information regarding their favorite brands (Zaglia, 2013). Customer engagement incorporates all interactions through brand communities (Doorn et al., 2010) and is defined as “the readiness of a customer to actively participate and interact with the focal object (e.g., brand/organization/community/website/organizational activity), [which] varies in direction (positive/negative) and magnitude depending upon the nature of a customer’s interaction with various touch points (physical/virtual)” (Islam and Rahman, 2016b, p. 12). Due to customers’ increased acceptance of online brand communities on Facebook, researchers have shown greater interest in investigating the motivations that engage customers on such communities.

3. Research model and hypotheses

3.1. Influence of information quality on customer engagement

Customer engagement in an online brand community banks substantially on quality of the information related to the brand (Dessart et al., 2015; Dholakia et al., 2009). In an online environment, information quality is defined as “users’ perception of the quality of information presented on a Web site” (McKinney et al., 2002, p. 299) and reflects the comparison between users’ expectations and perceptions of information disseminated (Liu et al., 2017). Customers in an online environment perceive information quality as the extent to which the given information conforms their expectations and meets their requirements of the particular activity in which they are engaged (Eppler, 2006). Customers also recognize the quality of information through indicators like information relevance, data richness, information access, interactivity and customization capabilities (Popovič et al., 2012). Information in online brand communities with such qualities provide customers with great experience which enhances their positive brand influence and eventually their engagement intentions and long lasting relationship with the brand communities (Dessart et al., 2015). Poor information quality may be distracting because it increases customers’ information search and processing costs (Gu et al., 2007). Online brand communities which provide rich information help customers obtain individual as well as mutual benefits are seen as more appealing (Gorla et al., 2010). Hence, customers are largely expected to engage in such communities.

Research suggests that information quality affects community commitment (Jang et al., 2008), customer satisfaction (Ghasemaghaei and Hassanein, 2015), brand awareness (Barreda et al., 2015), and organizational efficiency (Gorla et al., 2010). Brand communities that offer credible, updated, and reliable information to customers earn an apparent competitive advantage (Jang et al., 2008). Information that is relevant, sufficient, detailed, valuable, and from credible sources enables customers to attain an enhanced awareness of the brand and make better decisions related to the brand (Zhang and Watts, 2008; Zheng et al., 2013). Therefore, if the information provided on brand communities is of rich quality, it would drive customer engagement. Thus, we hypothesize the link between information quality and customer engagement:

H1. Information quality in an online brand community positively influences customer engagement.

3.2. Influence of system quality on customer engagement

System quality refers to “speedy and convenient search for information in the community” (Jang et al., 2008, p. 66) and is “a measure of the extent to which the system is technically sound, error-free, easy to learn, user friendly, well documented, flexible etc.” (Gorla et al., 2010, p. 219). A well-designed system is imperative for gaining organizational benefits such as cost reduction, enhanced process efficiency and increased revenues. Contrarily, an ill-designed system can prove to be destructive to organizations and lead to heightened product cost and inferior organizational efficiency (Gorla et al., 2010; Ghasemaghaei and Hassanein, 2015). System quality reflects user perceptions with respect to the ease of use, navigation, user friendliness and security of the system over time (Barreda et al., 2015).

A system that presents accurate and complete information to the members in an easy-to-interpret form is perceived to be more effective in function and helpfulness (Barreda et al., 2015). The quality of a system provides first impression to its users to respond favorably to the visible elements of the brand; ensures customer satisfaction, develops trust, and induces repeat purchases (Shin et al., 2013; Barreda et al., 2015). If a customer perceives a system to be of high quality, he/she is more likely to engage with that system, recall the brand, and spread favorable word of mouth (McKnight et al., 2004). Therefore, we posit the link between system quality and customer engagement:

H2. System quality in an online brand community positively influences customer engagement.

3.3. Influence of virtual interactivity on customer engagement

In the recent past, the Internet has arisen as an influential medium, offering abundant facilities for customer-firm interactions (Ho and Lee, 2015). Interactivity theory advocates the advantageous role of interactivity of online platforms in building relationship with customers (Di Pietro et al., 2012; Calefato et al., 2015). Virtual interactivity refers to “the extent to which online users might participate in adjusting the content of website in real time” (Steuer, 1992, p.4) and involves “the degree of information exchange among community members and between community members and the host of the community” (Jang et al., 2008, p. 66). Prior research has studied the role of virtual interactivity in developing advanced levels of branding elements. But the enhancement of customers’ knowledge of a brand through virtual interactivity has not yet been explored (Barreda et al., 2015).

In online brand communities, virtual interactivity connects customers to the brand (Duncan and Moriarty, 1998), strengthens their interactivity intentions (Madhavaram et al., 2005), enhances brand awareness (Duncan and Moriarty, 1998) and helps in brand recognition and recall (Madhavaram et al., 2005). Virtual interactivity is suggested to be imperative in developing e-satisfaction (Ho and Lee, 2015) and e-trust (Merrilees and Fry, 2003). Besides, interactivity motivates

customers to stay and participate in an online community. Therefore, we hypothesize the link between virtual interactivity and customer engagement:

H3. Virtual interactivity in an online brand community positively influences customer engagement.

3.4. Influence of rewards on customer engagement

Customers interact and engage in online platforms for want of certain rewards (Doorn et al., 2010). In an exchange relationship, customers perceive what they give as a 'cost', and what they receive as a 'reward' (Braun et al., 2016). In an online context, rewards refer to the degree of monetary or psychological appreciation for its proactive members (Jang et al., 2008) and reflect all the benefits that customers obtain through their relationship with the organization (Newman and Sheikh, 2012). Rewards may comprise of monetary (lotteries, special offers, referrals, and loyalty programs etc.) benefits, functional (information and support) benefits, social (peer recognition, altruism, kinship, and reputation building etc.) benefits, and psychological (membership and entertainment) benefits (Dholakia et al., 2009; Fuller, 2010; Wirtz et al., 2013; Barreda et al., 2015).

Providing incentives is seen as a crucial driver for customer engagement in online brand communities (Rohm et al., 2013). Customers seeking benefits find it adequate to participate in an online brand community that actively aims rewards to create customer awareness. These rewards affect customers' behavior to choose particular brand community among the competitive set and engage with such communities for co-creative activities (Doorn et al., 2010; Fuller, 2010). Previous studies have theoretically proposed that rewards are positively associated with the level of customers' engagement (Wirtz et al., 2013; Dessart et al., 2015). Braun et al. (2016) suggest that customers who attempt to create value through their engagement with online brand communities also aim at acquiring some financial and/or non-financial rewards. The rewards that customers perceive from an online brand community could presumably enhance customer engagement. Therefore, the link between rewards and customer engagement is hypothesized:

H4. Rewards in an online brand community positively influence customer engagement.

3.5. Customer engagement and brand loyalty

The direct relationship between customer engagement and brand loyalty is well documented in literature (Bowden, 2009; Brodie et al., 2013; Islam and Rahman, 2016a). Companies persistently look for various initiatives to build and amplify brand loyalty because it provides a competitive advantage to firms (Winters and Ha, 2012) and has a positive influence on firm performance (Pihl, 2013). One way to build and strengthen brand loyalty is to engage customers in an online brand community (Dessart et al., 2015).

Brand loyalty is "a deeply held commitment to re-buy or re-patronize preferred product/services consistently in the future" (Oliver, 1999, p. 34). In the context of online platforms, brand loyalty is defined as "the favorable attitude of consumers toward product/website/brand along with repeat purchase behavior" (Anderson and Srinivasan, 2003). If an online brand community satisfies some specific needs of customers, it will possibly generate favorable brand-relationship perceptions, leading to a higher level of brand community engagement, which in turn would lead to higher brand loyalty outcomes (De Vries and Carlson, 2014).

Firms encourage customers to participate and engage in advertisement campaigns (e.g., American Express, Dove, Coca cola, and Pepsi etc.) because the interactions by customer engagement develops emotional bonds, promotes trust, commitment, and loyalty amid the customers and the brand (Hollebeek, 2011a, b; Sashi, 2012). Customer engagement represents a rewarding experience such as peer recognition, kinship, entertainment, reputation building, and development of relational bonds through interactivity (Brodie et al., 2013; Vivek et al., 2012). Customers tend to commit to maintain such relationships (Lambe et al., 2001), therefore, develop loyalty intentions towards an online brand community as a mechanism to preserve these relationships (Dwivedi, 2015). Literature conforms that customer engagement may enhance loyalty through the cumulative effect of an persisting psychological connection as well as interactive experiences that go beyond purchase (Hollebeek, 2011a, b; So et al., 2016). In online brand communities, the experience offered by customer engagement develops a strong emotional bond that makes customers loyal (Hollebeek, 2011; Gummerus et al., 2012). Hence, the link between customer engagement and brand loyalty is hypothesized:

H5. Customer engagement in an online brand community positively influences brand loyalty.

3.6. Gender as a moderator

Gender socialization theory proposes that in addition to sex-specific skills, boys and girls also attain sex-specific personality attributes and self-concepts which allow them to entreat themselves as masculine or feminine, depending upon a specific culture (Barry et al., 1957). Consequently, males and females develop different value-sets which drive them to differ in

terms of their value and ethical choices (Mason and Mudrack, 1996). Two research streams that have addressed the gender differences are biological sex research stream (Worth et al., 1992; Chang, 2006) and gender identity research stream (Kahle and Homer, 1985; Gould and Weil, 1991). The former stream views gender in terms of biological sex referring to males and females (Kolyesnikova et al., 2009), whereas the later stream talks of gender in terms of ‘gender identity’ referring to psychological sex (Gould and Weil, 1991), that is based on feminine and masculine personality traits (Palan, 2001). Studies propose that gender identity affects consumer attitude and, therefore, predicts consumer behavior (Worth et al., 1992). However, researchers have questioned this proposition regarding the role of gender identity in consumer behavior (Palan, 2001; Kolyesnikova et al., 2009) and have suggested biological sex as a significant predictor of consumer behavior as compared to the gender identity (Kahle and Homer, 1985; Gould and Weil, 1991). Besides, more recent studies have suggested biological sex (males and females) as a realistic segmentation variable (Palan, 2001; Das, 2014). Therefore, this study takes gender as biological sex (male and female).

A large number of studies in the marketing domain have examined the role of gender, but such studies are scarce in relation to online environment (Rodgers and Harris, 2003; Ladhari and Leclerc, 2013). Research in the online environment domain has revealed that due to the difference in decision-making processes among men and women, gender differences play a crucial role in the adoption and usage of internet by men and women (Venkatesh et al., 2000; Verhagen et al., 2011). As distinct from women, men are involved in less exploratory and trial behavior, accomplish less website involvement, are more likely to make more web purchases, and have more favorable positive beliefs regarding online advertising than traditional advertising (Wolin and Korgaonkar, 2003; Richard et al., 2010). The results regarding the moderation of gender in online environment are controversial. One stream of research suggests that gender differences play an important role in online environment as men and women behave differently on web-based interactions (e.g., Lim and Kwon, 2010; Lu and Lee, 2010; Verhagen et al., 2011). Another research stream propounds that gender gap in the online environment is declining as both men and women consider the key features like information quality and system quality etc. as equally important (Liu et al., 2017; Nadeem et al., 2015; Zha et al., 2014). Additionally, similarities and distinction among men and women was found in how web atmosphere and Internet experience influence their internet usage behavior, attitude towards website and pre-purchase assessments (Richard et al., 2010). Therefore, this study attempts to address this inconsistency and identify how different genders influence the relationship between key characteristics of online brand communities and customer engagement.

Males and females articulate different perceptions, attitudes and behaviors toward Internet-based interactions (Chen and Macredie, 2010). Prior research reveals that males prefer “enjoyable” relationships (e.g., aspiring for sexual relationships and seeking romance); and hedonic or experiential values (e.g., viewing pornography, playing online games etc.) while using the Internet whereas females seek “serious” relationships (while meeting new people online); and utilitarian or functional benefits (e.g., shopping/educational assistance and course information) while using the Internet (Weiser, 2000). These findings point to the notion that gender (male and female) can moderate the relationship between online brand community characteristics and customer engagement which leads to the following four hypotheses:

H6. The relationship between information quality and customer engagement will vary across gender.

H7. The relationship between system quality and customer engagement will vary across gender.

H8. The relationship between virtual interactivity and customer engagement will vary across gender.

H9. The relationship between rewards and customer engagement will vary across gender.

4. Research methodology

4.1. Sample

This study conducted a questionnaire survey in an Indian university. Questionnaires were given to 800 students having an active account on Facebook. A set of 453 completed questionnaires was returned back. Due to the lack of integrity in some of the responses, twenty-three questionnaires were rejected, resulting in an actual sample size of 430 for the analysis. This study used students as the target respondents because modern-day students are tech-savvy (Nadeem et al., 2015), they have a frequent exposure to the Internet (Khare and Rakesh, 2011; Bolton et al., 2013), they form the highest demographics of Facebook (Burbary, 2011), and they participate notably in online brand communities (Islam and Rahman, 2016b). Facebook is a suitable context for the current study as it is one of the most widely used social networking sites (Roblyer et al., 2010). Besides, Facebook serves as an effective platform for many firms to establish brand pages for building and maintaining customer relationships (Islam and Rahman, 2016b).

Before distributing the questionnaire, students were given a brief understanding of online brand communities; only those students were taken as respondents who liked and/or followed at least one brand community on Facebook and who fre-

quently make online purchases (Islam and Rahman, 2016b). Most of the online brand communities liked and followed by the respondents were related to food and beverages, fashion, retail, and electronics brands. The most common communities liked were of Domino's Pizza India (17%), KFC (15%), Café Coffee Day (14%), Nike (14%), Shoppers Stop (10%), Flipkart (9%), Microsoft Lumia (8%), Dell (6%), Samsung India (4%), and Tata Docomo (3%).

The sample ($n = 430$) comprised of 57% (245) male and 43% (185) female respondents. About 58% (250) of the respondents were aged between 19–23 years, 27% (115) between 24 and 28 years, and 15% (65) between 29 and 33 years. Of the 430 respondents, 214 (49.76%) were enrolled in undergraduate courses, 129 (30%) in Master's courses, and 87 (20.24%) were Ph.D. scholars. Average annual family income of the respondents was INR 2,75,000 (US\$ 4143 approx). The respondents demonstrated high Facebook usage with 45% checking Facebook more than five times a day, 35% checking 1–3 times per day, and 20% checking at least once daily.

4.2. Measures

This study developed a two-section questionnaire: The first section asked respondents about their demographic information, the frequency of using Facebook, and the brand community they liked on Facebook. The second section comprised of questions related to the six constructs of the study. Measures for all the constructs were adapted from various sources and modified to fit the context (See Appendix 1). Information quality and system quality were assessed by items adapted from Ahn et al. (2007). Virtual interactivity and reward activities were measured through items adapted from Jang et al. (2008). Customer engagement was assessed through the scale adapted from Hollebeek et al. (2014). Finally, brand loyalty scale was adapted from Parasuraman et al. (2005). The responses were collected on a 7-point Likert scale with 1 for “totally disagree” to 7 for “totally agree”.

5. Analysis and results

A preliminary data analysis was conducted first; wherein the accuracy of data, outliers, normality, missing values, and multi-collinearity of all the variables were checked. Next, confirmatory factor analysis (CFA) using AMOS 20 was run to check the psychometric characteristics of the scales used by testing the convergent and discriminant validity. In addition to the content validity and expert suggestions; items having weak (< 0.5) factor loadings were deleted. Finally, structural equation modeling was used to test the proposed model and assess the proposed relationships between the constructs of this study.

Table 1 presents the factor loadings, Cronbach α , composite reliability (CR) and average variance extracted (AVE) of the constructs. Loadings of all the items were greater than 0.5, thereby, fulfilled the convergent validity criteria (Bagozzi, 1994). The Cronbach α values for all constructs were acceptable (> 0.7). The CR should be greater than 0.70 (Fornell and Larcker, 1981); in this study, it ranged from 0.75 to 0.87, hence, acceptable. The AVE of the constructs ranged from 0.62 to 0.69 i.e., greater than the accepted value of 0.50 (Fornell and Larcker, 1981). Harman's single-factor test (Podsakoff et al., 2003) was used to examine the common method bias. The results depicted that the first factor explained 28% of the total variance, which is less than 50%. All the loadings reflected significant t values ($p < 0.01$), and significant convergent validity (> 0.5) which depicted that common method bias was not a threat to our study.

Discriminant validity that ‘assesses the degree to which measures of different concepts are distinct’ (Bagozzi, 1994, p. 20); is assessed in our study by comparing the squared root of the AVEs of each construct with its corresponding correlations (Fornell and Larcker, 1981). As shown in Table 2, the squared root of the AVEs of each variable is higher than the inter construct correlations, indicating an acceptable validity.

5.1. Structural model

To estimate the fitness of the model, estimates including the χ^2 statistic, the goodness of fit index (GFI), root mean square error of approximation (RMSEA), comparative fit index (CFI) and normed fit index (NFI) were assessed. Joreskog and Sorborm (1989) suggest acceptable values to be > 0.9 for the GFI, and the NFI; Hu and Bentler (1999) suggest the value to be < 0.95 for the CFI. The RMSEA values less than 0.06 indicate an acceptable range (Browne and Cudeck, 1993). The model in Fig. 1 (without moderation of gender) presented an acceptable overall fit (CMIN $\chi^2 = 480.50$, $p < 0.05$, $df = 157$, $\chi^2/df = 3.06$, NFI = 0.931, RMSEA = 0.061, CFI = 0.940, IFI = 0.925, and GFI = 0.930). The structural model results presented in Table 3 show that information quality ($\beta = 0.53$; $t = 5.14$, $p < 0.05$), system quality ($\beta = 0.45$; $t = 4.67$, $p < 0.05$), virtual interactivity ($\beta = 0.51$; $t = 5.62$, $p < 0.05$), and rewards ($\beta = 0.41$; $t = 4.53$, $p < 0.05$) exhibit significant positive effects on customer engagement, with information quality and virtual interactivity exhibiting the strongest effects (Fig. 2). The results also show a significant positive effect of customer engagement on brand loyalty ($\beta = 0.52$, $t = 5.49$, $p < 0.05$). These results support hypotheses H1, H2, H3, H4 and H5.

To test the moderating effect of gender as predicted in H6, H7, H8 and H9, this study conducted multi-group analysis in AMOS 20.0. The entire sample was split in two groups: male ($n = 245$) and female ($n = 185$). The independent model estimation for each group exhibited a good fit: for males, $\chi^2 = 280.142$, $df = 125$, $\chi^2/df = 2.21$, NFI = 0.912; CFI = 0.923, IFI = 0.921, GFI = 0.919, RMSEA = 0.060; for females, $\chi^2 = 235.53$, $df = 139$, $\chi^2/df = 1.69$, NFI = 0.901; CFI = 0.911, IFI = 0.905, GFI = 0.901,

Table 1
Reliability and validity of the constructs.

Construct	Items	Factor loadings	Cronbach α	Composite reliability	AVE
System quality	SysQ1	0.80	0.80	0.86	0.59
	SysQ2	0.75			
	SysQ3	0.81			
	SysQ4	0.78			
	SysQ5	0.73			
	SysQ6	0.75			
Information quality	IQ1	0.75	0.77	0.88	0.57
	IQ2	0.77			
	IQ3	0.73			
	IQ4	0.79			
	IQ5	0.83			
	IQ6	0.70			
	IQ7	0.74			
Virtual interactivity	VI1	0.77	0.81	0.83	0.61
	VI2	0.80			
	VI3	0.79			
Reward	Rw1	0.79	0.78	0.84	0.61
	Rw2	0.79			
	Rw3	0.78			
Customer engagement	CE1	0.81	0.79	0.87	0.60
	CE2	0.77			
	CE3	0.80			
	CE4	0.76			
	CE5	0.69			
	CE6	0.83			
	CE7	0.78			
	CE8	0.80			
Brand loyalty	BL1	0.78	0.76	0.82	0.63
	BL2	0.82			
	BL3	0.80			

Table 2
Descriptive statistics and correlations.

Variable	Mean	S.D.	SysQ	IQ	VI	Rw	CE	BL	Square root of AVE
(SysQ)	4.67	1.14	–						0.76
(IQ)	4.54	1.42	0.48 [*]	–					0.75
(VI)	4.09	1.10	0.41 [*]	0.42 [*]	–				0.78
(Rw)	4.20	1.11	0.39 [*]	0.40 [*]	0.49 [*]	–			0.78
(CE)	4.11	1.33	0.43 [*]	0.37 [*]	0.46 [*]	0.36 [*]	–		0.77
(BL)	4.38	1.21	0.38 [*]	0.40 [*]	0.33 [*]	0.31 [*]	0.44 [*]	–	0.79

Note: SysQ depicts system quality, IQ depicts information quality, Rw depicts reward, CE depicts customer engagement and BL depicts brand loyalty.
* Correlation significance at 0.01 level; N = 430.

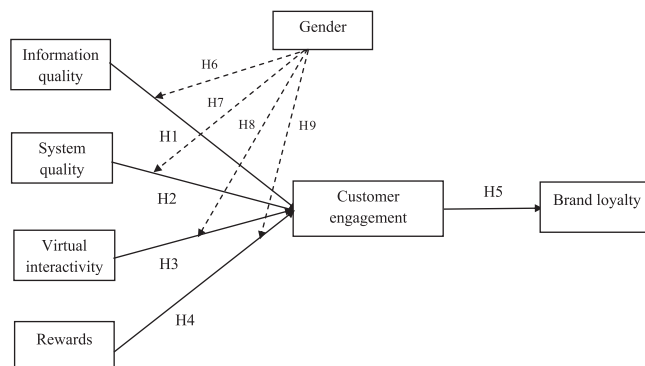


Fig. 1. Research model.

Table 3
Hypotheses testing results.

Hypotheses	β	t-values	Test results
H1: information quality-customer engagement	0.53	5.14	Supported
H2: system quality-customer engagement	0.45	4.67	Supported
H3: virtual interactivity-customer engagement	0.51	5.62	Supported
H4: rewards-customer engagement	0.41	4.53	Supported
H5: customer engagement-brand loyalty	0.52	5.49	Supported

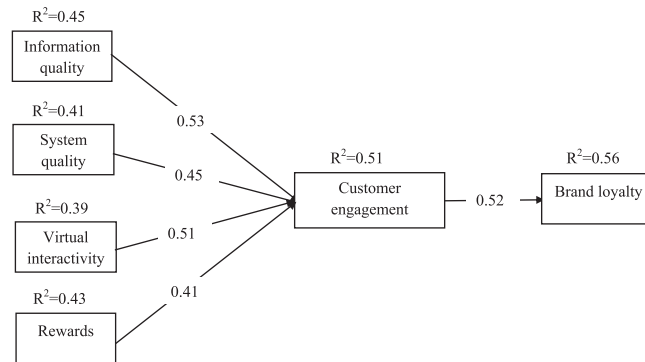


Fig. 2. Final model.

Table 4
Hypotheses testing results across gender.

Hypotheses	Male		Female		Test results
	β	t-values	β	t-values	
H6: information quality-customer engagement	0.51	5.03	0.52	5.33	Not supported
H7: system quality-customer engagement	0.38	3.73	0.37	3.79	Not supported
H8: virtual interactivity-customer engagement	0.46	4.63	0.48	4.99	Not supported
H9: rewards-customer engagement	0.39	3.76	0.40	4.19	Not supported

RMSEA = 0.069. The structural multi-group again demonstrated a good model fit: $\chi^2 = 406.221$, $df = 192$, $\chi^2/df = 2.115$, NFI = 0.909; CFI = 0.917, IFI = 0.910, GFI = 0.906, RMSEA = 0.059. These results hold the same pattern across two sample sets.

Table 4 presents the results of the relationship effects across male and female samples. As evident from the results, the relationship between information quality and customer engagement is positive and significant for both the genders (male: $\beta = 0.51$, $t = 5.03$, $p < 0.01$; female: $\beta = 0.52$, $t = 5.33$, $p < 0.01$), not accepting H6. The significant positive effect of system quality on customer engagement does not vary across gender (male: $\beta = 0.38$, $t = 3.73$, $p < 0.01$; female: $\beta = 0.37$, $t = 3.79$, $p < 0.01$), not supporting H7. Similarly, the significant positive effect of virtual interactivity on customer engagement remains invariant across the two genders (male: $\beta = 0.46$, $t = 4.63$, $p < 0.01$; female: $\beta = 0.48$, $t = 4.99$, $p < 0.01$), failing to accept H8. Finally, a significant positive relationship was found between rewards and customer engagement for both the genders (male: $\beta = 0.39$, $t = 3.76$, $p < 0.01$; female: $\beta = 0.40$, $t = 4.19$, $p < 0.01$), not supporting H9. Therefore, gender does not moderate the effect of the community characteristics on customer engagement.

6. Discussion and implications

Social networking sites have remarkably transformed the communication practices by customers and organizations worldwide. Customers have become agile in impelling conversations with organizations through online networks in general and brand communities in particular. Building and maintaining a loyal customer base in such a highly networked era is the real challenge organizations are dealing with. Organizations are interested in identifying superior drivers of brand loyalty as compared to conventionally used marketing conceptions like customer satisfaction and perceived service quality. Customer engagement has been suggested to be one such unconventional potential predictor of brand loyalty. Therefore, organizations are developing brand communities on Facebook to advertise, promote, and communicate their offerings to their customers. In the rapidly progressing social networking platform "Facebook", organizations seek to understand customers' motivations that drive their engagement in brand communities and eventually enhance brand loyalty. Online brand communities on

Facebook are the logical accession of the brand websites. They are consequential and adequate means for driving customer engagement, targeted traffic and profit.

This study has tested the possible effects of online brand community characteristics (information quality, system quality, virtual interactivity, and rewards) on customer engagement and the subsequent effect of customer engagement on brand loyalty. At the cumulative level, each of the characteristics positively influences customer engagement, with information quality and virtual interactivity bearing the strongest influence. Customer engagement also has a strong positive impact on brand loyalty. Given that literature to explain customer engagement in online brand communities through Stimulus-Organism-response framework is scanty, and the joint impacts of brand community characteristics on customer engagement is almost absent, this study adds to the engagement literature by proposing and empirically validating a novel model for engaging customers with online brand communities on Facebook, taking into account the moderating role of gender.

Exploring the gender role helps marketers to determine if they need specific gender based strategies for men and women. The moderation analysis by this study reveals that the impact of all the four characteristics of online brand communities on customer engagement is consistent across male and female members. This signifies that gender gap in the online environment is declining. These findings are contradictory to the earlier studies which contend that system quality is considered as a significant factor by men for blogging whereas content quality is viewed as important by females (Lu and Lee, 2010), and that males report information quality higher than females (Lim and Kwon, 2010). Majority of these studies used a different or partially different sample than our student sample, which could be a reason for the non-moderation effect revealed by this study. However, the results of this study are consistent with some recent studies that found no significant gender differences in online contexts particularly regarding information quality and system quality and, therefore, support the argument of the diminishing online gender gaps. Ladhari and Leclerc (2013) did not find any difference across genders while examining information quality, web design, and e-tailers' responsiveness. Zha et al. (2014) detected no significant differences for gender in terms of system quality, information quality, service quality and affinity. Similarly, no significant effect of gender on expectation and perception of information quality was revealed by Liu et al. (2017). Likewise, the results of this study are consistent with Nadeem et al. (2015) who revealed that gender gap in the online environment is declining. The results offer significant theoretical as well as practical implications as gender analysis in online brand communities' context is at a very early stage (Nadeem et al., 2015; Zhang et al., 2014). This study suggests that marketers do not need a gender based segmentation of their online communities to achieve customer engagement and loyalty. However, it is essential for online brand community practitioners to focus on all the four characteristics of brand communities considering the broad acceptance of online community characteristics as crucial factors to determine customer engagement. In order to create customer engagement in online brand communities, organizations should make vigorous efforts to trigger virtual interactivity, and provide quality information, offer rewards and consistently upgrade system quality.

Successful brand communities allow customers to interact, post reviews, earn rewards, receive and contribute updated and credible information regarding their brands. The functionality of online brand communities has advanced in the recent years, providing an opportunity for marketers to induce customer engagement that strengthens brand loyalty. The findings point out that information quality and virtual interactivity are the most influential precursors of engagement in online brand communities. Organizations are, therefore, suggested to provide appropriate, reliable and timely information, generate talking points and encourage customers to interact with the brand and other customers; let customers ask questions, submit queries, and share opinions and knowledge. Marketers need to configure quality control mechanisms to ensure the quality of information. Marketers should intermittently monitor, filter and remove content that is from biased or unreliable sources. Online community practitioners could ask members to rate the helpfulness of information and highlight some most helpful content/posts. This could assist other customers/members to better understand the topic and take the discussion on track. Organizations should also vigorously pursue ways to amplify virtual interactivity, upgrade system quality, and raise rewards for customers since all these factors significantly affect customer engagement in online brand communities. Organizations are suggested to establish a flexible mechanism for chatrooms on brand communities to provide rich information and interactivity to its members. Initiating a dialogue with its online community members to create value by expediting customer to share their community specific experiences, problems and solutions. Organizations can also implement customized functions for particular members by creating and directing favored topics identified by tracking down member activities. This approach can cultivate a sense of belonging for brand community members and ultimately attract and retain customers in their online brand communities.

To upgrade system quality and magnify virtual interactivity, organizations should make information search effective by providing convenient navigational tools, tracking members' past browsing activities and recommending topic or highlighting the most favored topics currently being conferred. This may bring eye-catching effects to attract customers to engage. Marketers should provide a more organized way to present opinions that could allow customers to comprehensively read, write and follow the discussions on the brand community. This may also inspire more customers to engage and contribute. Marketers can communicate brief but enjoyable interactive quizzes to their customers who follow their brand communities. Such information can assist in personalizing the content and promotions; it may also amplify interactivity; and may lessen the impediments in content creation. This exercise may also reinforce customer engagement, thereby, enhancing the overall effectiveness of online brand communities. Lastly, organizations should acknowledge customer contributions in brand communities and should escalate the visibility of active customers in the community. Based on customers' contribution history, different badges such as top contributor or gold customer could be introduced and announced to the whole community. In addition, other customized (tangible as well as intangible) rewards such as lotteries, special offers, and referrals etc. should

be announced frequently. This will help organizations develop strong customer engagement through online brand communities and subsequently enhance brand loyalty.

7. Limitation and future research

This study has certain limitations that render scope for future research. First, this study employed only Facebook as the context to empirically validate the model, further studies are suggested to incorporate other social networking platforms like Twitter and Pinterest etc. to come up with more diverse understanding and results. Second, it is imperative to extend the findings of this study into some brand and industry specific contexts such as such as fashion, electronics, hospitality, and healthcare etc. so as to validate an adequate level of external validity to the current study. We believe that focusing on one specific brand community would help to remove possible impacts of different characteristics such as interface designs etc. in different brand communities. Third, the four characteristics of online communities used in this study may not reflect the entire community characteristics, further customer motivations of engagement in online brand communities need to be explored. The moderating effect of customers' experience and trust with the brand communities may better explain the mechanism of customer engagement in online brand communities. Finally, future studies could examine the effect of the online community characteristics on other constructs such as brand equity, brand image, brand attachment, and brand loyalty.

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Appendix A1

See [Appendix 1](#).

Appendix 1

Construct items.

Construct	Items	Source
System quality	1. [BC] has an appropriate style of design for site type 2. [BC] has easy navigation to information 3. [BC] has fast response and transaction processing 4. [BC] keeps personal information secure from exposure 5. [BC] has good functionality relevant to site type 6. [BC] creates an audio-visual experience	Ahn et al. (2007)
Information quality	7. [BC] has sufficient contents where I expect to find information 8. [BC] provides complete information 9. [BC] provides site-specific information 10. [BC] provides accurate information 11. [BC] provides timely information 12. [BC] provides reliable information	Ahn et al. (2007)
Virtual interactivity	13. [BC] communicates information in an appropriate format 14. [BC] has a high degree of activity in informational and interpersonal exchanges 15. [BC] has a high Speed of inquiry and response 16. [BC] makes Exchanges between host and members	Jang et al. (2008)
Reward	17. [BC] offers Monetary rewards 18. [BC] offers Psychological rewards	Jang et al. (2008)
Customer engagement	19. [BC] upgrades (downgrades) member privileges 20. Using [BC] gets me to think about the brand 21. I think about [BC] a lot when I'm using it 22. Using [BC] stimulates my interest to learn more about the brand 23. I feel very positive when I use [BC] 24. Using [BC] makes me happy 25. I feel good when I use [BC] 26. I'm proud to use [BC]	Hollebeek et al. (2014)
Brand loyalty	27. I spend a lot of time using [BC], compared to other brand communities 28. I say positive things about [BC] to other people 29. I recommend [BC] to someone who seeks my advice 30. I encourage friends and others to do business with [BC]	Parasuraman et al. (2005)

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