How Social Media Marketing Enhances Brand Communities Engagement: Developing an Integrated Model Using S-O-R Paradigm

Shubhi Changani[✉] [iD] and Rakesh Kumar [iD]

School of Management Studies, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, India
shubhichangani@gmail.com, rakesh@mnnit.ac.in

Abstract. The purpose of this study is to investigate the various dimensions that lead to the enhancement of brand community engagement. Furthermore, the study intends to investigate the indirect relationship between social media marketing activities and brand community engagement by investigating the parallel mediating roles of information quality, system quality, and service quality, ultimately influencing brand loyalty. A purposive sampling technique was used to collect the data from individuals actively involved in following brand community of various brands on social media. The data was collected using a structured questionnaire, and the analysis was carried out using structural equation modelling in SPSS 20 and AMOS 22. The outcomes of the study demonstrated a substantial relationship between social media marketing activities, information quality, system quality, service quality, brand community engagement, and brand loyalty. Furthermore, the study discovered a significant parallel mediation effect, revealing the indirect impact between social media marketing activities and brand community engagement. Lastly, the study's findings and their implications are thoroughly evaluated.

Keywords: Online brand community · social media marketing activities · brand community engagement · brand loyalty

1 Introduction

The past decade has led to proliferation of online avenues and exponential growth of social media. Brands are taking advantage of this modern era of digital communication to broaden their geographical coverage and enhance brand evaluation among their customer base [1]. Customers on the other hand are gradually gaining authority to regulate their interaction with the brand. Social media has reshaped simple dyadic interactions and surpassed conventional media by engaging customers, making connections, and establishing long-term relationships [2]. In marketing literature, the effort to enhance and sustain customer engagement, building online brand communities and personalizing individual's experience is a key aspect [3]. Thus, marketers' objectives expanded from relationship marketing to engaging clients in all possible ways [4].

An online brand community is a virtual space where people with common interest or passion for a particular brand can engage, interact, and form connections [5]. Such communities mostly operate through digital platforms such as social media, websites, forums discussions, etc. building relationships among like-minded members [6]. These online communities provide a great platform for businesses to accumulate feedback, collaborate with members, and leverage user-generated content. In return, brands provide members additional perks, strengthening a sense of belonging and worth, therefore playing an essential part in enhancing brand loyalty [5, 7].

Online brand communities (OBCs) have been identified as a significant arena for fostering and monitoring brand community engagement (BCE). Online BCE is the powerful inherent motive that drives connection among members with an OBCs [8]. Members of the OBCs are people who track all activities on social media, promote brand's offerings and content with others, and enjoy viewing everything a brand does. For instance, these OBCs members can not only receive brand related material, but they can actively contribute to its creation [5]. Hence, for multimodal communication and productive social community networking most of the OBCs are built on social media [9].

Considering growing recognition of the vitality of online brand communities in marketing literature, there still exists a compelling requirement to explore various aspects of BCE [10–12]. Moreover,the study identifies a notable research gap in the intricate relationships involving social media marketing activities (SMMA) and their associations with information quality (InfoQ), system quality (SysQ), and service quality (SQ). Existing studies have independently explored aspects of SMMA [13], as well as InfoQ [14], SysQ [14], and SQ [15] in various online context. Despite these individual examinations, there remains a scarcity of comprehensive investigations into the interplay among these elements. For instance, Fetais [16] delved into the impact of SMMA on brand community engagement (BCE). Naqvi [14], investigate the influence of InfoQ and SysQ of e-brand communities on customer engagement. Our study aims to explore the intricate relationships among these dimensions, offering a more comprehensive perspective on how SMMA influences information, system, and service quality.

Thus, in response to this gap the study develops and integrated framework incorporating stimulus-organism-response paradigm (S-O-R) for managing engagement in online brand communities. By utilizing S-O-R theory as our framework, we aim to provide a more comprehensive understanding of the factors that influence brand community engagement and how companies can effectively use social media marketing activities to engage with their customers. The research aims to investigate the indirect parallel mediation effect of InfoQ, SysQ and SQ on the relationship between SMMA and BCE in an OBC. Subsequently, examining the relationship between BCE and brand loyalty (BL).

Such insights can inform managers of relevant brands about whether they need to consider InfoQ, SysQ and SQ in their social media marketing activities to maximize brand community engagement. Marketers are advised to focus on providing general and exclusive information related to new products and promotions, addressing service factors like effective problem-solving and responsiveness, and considering system factors for optimal performance [17]. Second, this study is among the first to discuss quality context in the domains of social media marketing activities and brand community engagement.

Therefore, it provides an initial understanding of engagement optimization in online brand communities.

2 Theoretical Background

2.1 Stimulus-Organism-Response

The research incorporates Mehrabian and Russell's [18], Stimulus-Organism-Response (SOR) theory, which is critical in constructing the study's conceptual framework. Stimulus pertains to sensory and cognitive inputs that users encounter while dealing with brand online, encompassing user experiences, emotional connection, sense of belonging, social influence, visual design, etc. In the virtual realm, the stimulus serves as the foundation of online brand communities, and how its features shape the customer's attitude towards the brand [14]. The present study considers social media marketing activities [19, 20], information quality [21], system quality [22] and service quality [22] of an online brand community as the stimuli attributes that holds substantial influence over engagement within online brand community.

Subsequently, the organism dimension includes information and thought processing, with users responding to environmental cues or stimuli [23]. It includes all the processes between inputs and consumer responses, including thoughts, perceptions, emotions, and experiences [24]. The organism in the current study represents the level of customer engagement with the brand community [20–22]. It includes consumers' interaction, involvement with other members and their overall perception of a brand within an online brand community.

Response is the outcome behavior that an organism (individual) exhibit's reaction to a stimulus. Consumer response to stimuli is divided into approach and avoidance [25]. Approach indicates the user's willingness to actively engage in an online brand community, whereas avoidance signifies the user's decision not to get involved with the brand community. In this specific study, brand loyalty is depicted as the response, indicating the user's intention to make repeat purchases [19, 20]. In the context of BCE, user behaviour goes beyond recurrent decisions to include a favorable internal perception and affinity for the brand.

In essence, the SOR theory assists us in understanding that customer's response to environmental stimuli is not a one-way reaction. It's a complex interplay between the stimulus, the user's internal processes intervening between the inputs and their final response [26]. Therefore, the intent of the research is to validate BCE, and this theory provides a solid theoretical foundation by understanding how external stimuli can influence individuals' inner cognitive and emotional factors, forming their responses and behaviours in the context of online brand communities.

2.2 Brand Community Engagement (BCE)

"Community engagement encompasses customers' altruistic behaviours towards fellow members, active participation in collective activities, and voluntary contributions to community-endorsed initiatives aimed at enhancing shared value for both oneself and

others" [27, p. 66]. Brand community engagement is an important platform for firms to strengthen their point of difference and competitive position by deepening consumer ties and engaging them in collaborative brand-building. Brand community engagement differs from ordinary actions such as "joining" or "liking" a brand page [28]. It goes beyond these initial steps, indicating a purposeful involvement by customers to engage with fellow community members [6]. Furthermore, community participation is linked to beneficial community behaviours such as assisting other members of the community, participating in cooperative activities for mutual benefit, and organizing offline events among members [29]. Additionally, individuals who strongly identify with a brand and actively engage with it are found to experience elevated positive emotions and potent effects triggered by specific emotions [30].

2.3 Literature Review and Hypotheses Development

Social media is considered one of the most vital marketing mediums to communicate brand information since its interactive attributes enable participatory, collaborative, and knowledge-sharing activities [31]. Brands regularly engage with their customers through social media marketing activities (SMMA) to captivate their attention and affection [32]. They increasingly employ SMMA as their major marketing strategy to build brand trust, brand loyalty, consumer-brand relationships, and purchase intention [33]. Inextricably linked to BCE, social media marketing is referred to as "a process by which companies create, communicate, and deliver online marketing offerings via social media platforms to build and maintain stakeholder relationships that enhance stakeholders' value by facilitating interaction, information sharing, offering personalized purchase recommendations, and word of mouth creation amongst stakeholders about existing and trending products and services" [34, p. 1296]. Studies on social media marketing incorporate multiple elements to evaluate it. Kim and Ko [35], considered trendiness, entertainment, interactivity, word of mouth, customization as drivers of SMM in the luxury brand business. Similarly, Yadav and Rahaman [34], also used five key elements to measure social media marketing in e-commerce industry i.e., interactivity, trendiness, word of mouth, informativeness, and personalization. The present study conceptualizes SMM as a multidimensional construct along with the extant literature [36, 37]. Accordingly, marketers should focus on those SMMA that deliver sensory stimulation to customers for creating competitive advantage, long-lasting impression, emotional connection [38].

Social media marketing heavily relies on social media content [1], it is crucial to comprehend the characteristics of this content that motivates BCE to achieve brand loyalty. Successful SMMA prioritizes the development of genuine, credible and valuable information in order to build trust and cultivate loyalty among users [39]. However, most of the information shared is user generated creating a dynamic and diverse information landscape [40]. While consumers are inclined to engage with the posted content, there is a possibility of misinformation spreading [41, 42]. As a result, a persuasive case can be made for brands to take innovative methods to social media marketing, assuring the dissemination of information that not only captivates but also connects with customers inside online brand communities. This strategy seeks to encourage meaningful engagement, authentic connections, and, eventually, brand loyalty.

H1: Social media marketing activities positively affect information quality.

Furthermore, with the advancement of social media, brands with great system features such as user-friendly interface, sound interactivity and design may assist in attracting users while fostering brand loyalty and customer engagement [43]. Social media marketing activities frequently accentuate user-centric features and functionalities [44]. Simple, concise, and useful information assisted users in smoothly navigating the system enhancing system usability.

H2: Social media marketing activities positively affect system quality.

E-service quality refers to "the extent to which online websites improve the efficiency and effectiveness of customers' browsing and consumption, including service links such as distribution and consultation" [45]. Furthermore, social media marketing has a considerable impact on the quality of a brand's service. It is widely acknowledged as a requirement for customer perception and experience [46]. Interaction in OBCs enables user engagement through interactive content and contests, generating more personalized and enjoyable experience. Moreover, services are tailored to match current trends, technology, and user behavior, resulting in customer engagement. Brands can enhance their service by addressing user suggestions, rectifying their issues related to delivery, returns, refunds.

H3: Social media marketing activities positively affect service quality.

Information quality (InfoQ) assesses customer expectation and perceptions regarding the information disseminated by the brand [24]. In a digital space it is interpreted as "user's perception of the quality of information presented on website" [47, p. 299]. The technical characteristic of InfoQ includes accuracy, up to date and sufficiency [48], of the information offered by brands on products and services via OBCs. Based on existing literature, users also find certain characteristics of InfoQ which further includes content quality, format interactivity, data accessibility, completeness, and consistency [49, 50]. Information with high content quality and personalized information in the online brand communities stimulate experience and emotional resonance among users, allowing the formation of unique user groups with commonalities and building of long-term relationships with brand [38]. Studies suggested there is a significant relationship between InfoQ and BCE [14, 24].

H4: Information quality positively affects brand community engagement.

System quality is the user's assessment of the operational efficiency of system features. In the online setting SysQ was adopted to measure ease, bug free, performance, customer-friendly response time of information system [51], all these aspects improve online user experiences. Users' opinions in OBCs are influenced by issues encountered throughout the online purchase process (e.g., difficulties with shipment, return, refund, or exchange). Customers perceive a system to be more effective when it is less complex and as a result, they are more inclined to recall and recognize the brand [52]. They expect swift accessibility, log-on, search/browse, and webpages downloading [50], therefore performance of brand is determined by the quality of its website. Jang [53], characterized SysQ as a fast and simple exploration of information within the community.

Subsequently, it is essential to assess the magnitude to which system quality influences BCE. In many earlier studies, system quality was considered a critical factor influencing customer engagement in OBCs [14, 24, 54].

H5: System quality positively affects brand community engagement.

In the marketing literature, service quality often reflects customer perceptions and value-judgement of a product or service [55]. It is the level to which a user evaluates the service provider's assistance and services delivered through the online platform in terms of swiftness, authenticity, and empathy [56]. It is the value-added attribute of marketers since it possesses firms' credibility and legitimacy which subsequently increases customers' response towards the brand. Roy [57], have highlighted that favorable reviews of service quality upgrades firms-customer relationship quality and is thus likely to elicit customer engagement behaviors in online brand communities. Prior studies have attempted to explain how service quality is connected to customer engagement [58–60]. Added to that, according to Chang [61], customer engagement indirectly influences satisfaction and word of mouth through service quality in healthcare industry. SQ has been identified as a significant predictor of customer engagement [54, 62]. Additionally, it has been noted as an important factor between the relationship between customer experience and engagement [63] in online brand communities.

H6: Service quality positively affects brand community engagement.

InfoQ, SysQ and SQ are major elements that determine customer attitude towards the technology they use. Customers engaging in online brand communities are more likely to employ the entire spectrum of engaging options to create their own online experience if they believe perceived quality (InfoQ, SysQ, SQ) is good [64]. With higher perceived quality customers are more inclined towards the brand and are more likely to interact with members of OBCs. Each of the perceived quality (InfoQ, SysQ, SQ) has been widely acknowledged as strong predictor user/customer satisfaction and experience which elevates emotional connection (i.e., customer engagement) with the brand [63] consequently leads to loyalty in OBCs. Busalim [50], conducted a systematic literature review and confirmed that InfoQ, SysQ and SQ encourage users to continue use the online platform for social interaction. Accordingly, we argue that when a customer has better perceived InfoQ, SysQ and SQ, it means he/she would have an intention to be engaged with the brand in OBCs.

H7: Information quality mediates the effect of social media marketing activities on brand community engagement.
H8: System quality mediates the effect of social media marketing activities on brand community engagement.
H9: Service quality mediates the effect of social media marketing activities on brand community engagement.

In OBCs context, BCE reflects the intrinsic motivation of community members to interact and communicate with members [65]. An essential consequence of BCE is brand loyalty [14]. Studies have demonstrated correlation between brand loyalty and BCE in context to luxury fashion brands [16]. Furthermore, the strong correlation of loyalty with customer engagement was verified by a review paper [14]. More pertinent to present

research context, there exists a positive correlation between BCE and brand loyalty within the facebook brand communities [67], social media brand communities [68], tourism social media [69], online hotel brand community [70]. Moreover, within the context of OBCs customer engagement is the strong predictor brand loyalty [24]. Furthermore, it is found that relationship commitment and customer satisfaction influences loyalty intention to use the online brand community [38]. Therefore, it is anticipated that in an OBC, an individual's assessment of InfoQ, SysQ, and SQ can facilitate BCE and consequently increase brand loyalty.

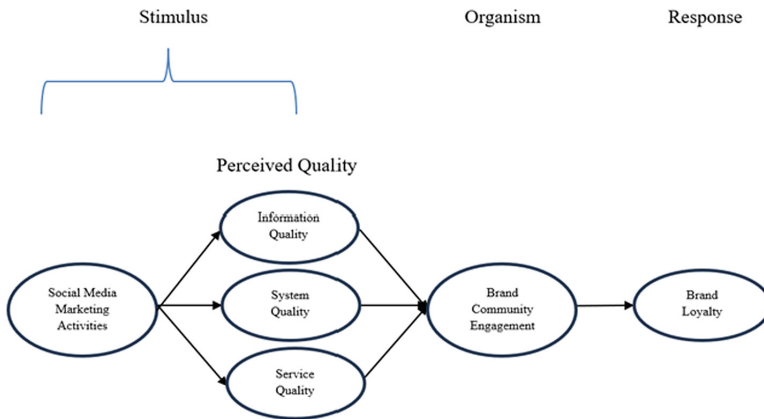H10: Brand community engagement positively affects brand loyalty (Fig. 1).

Fig. 1. Proposed Research Model [14, 24]

3 Methodology

3.1 Procedure and Sample

In this study, a purposive sampling approach was employed to gather data. It was used to improve the sample's congruence with the research's aims and objectives, hence increasing the research's quality and the credibility associated with both the data gathering method and the resultant conclusions [71]. The selected participants bring forth relevant insights and experiences directly related to the phenomena under investigation, possessing firsthand knowledge of the social media marketing activities employed by brands within online brand communities. A thoroughly prepared questionnaire was developed utilizing validated and widely recognized scales to examine every aspect of the research model. The target population for data collection was individuals actively following the brand community of various brands on social media. A total data of 247 respondents was collected. However, ten of these questionnaires were incomplete and were thus omitted from further analysis. Therefore, 237 usable questionnaires were thoroughly examined for further investigation in the study.

The study drew on a diverse sample of respondents to provide comprehensive insights into the topic. Table 1 summarizes the participant profile, which includes a wide range of demographic variables. The gender breakdown of respondents revealed a slight majority of males (58.2%) versus females (41.8%). Participants ranged in age from 18 to 25, with 64.6% aged 25 to 30, 27.4% aged more than 30 with 8%. The respondents' educational background varied with notable presentation across postgraduate and above with 49.4%, followed by graduate (27.4%) and intermediate (23.2%). Further, the annual income of participants revealed income less than 5 lakh with 49.4%, income between 5–10 lakh with 27%, and income above ten lakhs with 23.6%.

Table 1. Demographic profile

Sno.	Variable	Categories	Frequency	Percentage%
1	Gender	Male	138	58.2
		Female	99	41.8
2	Age	18–25	153	64.6
		25–30	65	27.4
		More than 30	19	8
3	Marital Status	Married	23	9.7
		Unmarried	214	90.3
4	Education	Intermediate	55	23.2
		Graduate	65	27.4
		PG and above	117	49.4
5	Annual Income	Less than 5 Lakh	117	49.4
		5–10 Lakh	64	27
		Above 10 lakhs	56	23.6

3.2 Measures

Pilot tests were carried out to finalize scale items, involving a thorough discussion of a comprehensive list of items related to SMMA, InfoQ, SysQ, SQ, BCE, and BL with 30 respondents. The objective was to assess the relevance and quality of these items. Based on the feedback received, certain items were modified. Throughout this process, adjustments were made to the language of a few items within the IQ and SMMA constructs, addressing issues of repetitiveness. The measurement scales employed in this study were sourced from existing literature. The questionnaire comprised three sections. The initial section focused on gathering preliminary information from respondents. These initial questions encompassed inquiries such as "Do you follow social media brand community pages?", "Do you purchase from social media brand community page?" and "How frequently do you purchase through social media brand community page?". This section

assisted in establishing the foundation for understanding respondents' involvement with online brand communities on social media.

The subsequent section comprised items assessing the primary concepts using a five-point Likert scale, ranging from 1, indicating "strongly disagree," to 5, signifying "strongly agree." A Likert scale was employed to assess attitudes by allowing respondents to express both the intensity and direction of their opinions on a given topic [72, 73]. The construct of social media marketing activities was measured by employing scales adapted from Ismail [73]. For information, system, and service quality, three-item scales were adopted from Aboelmaged [48]. Brand community engagement was evaluated using items adapted from Algesheimer [65]. As the dependent variable, brand loyalty was measured using questions adapted from Alwaidi [74]. Finally, demographic information was collected to provide contextual background to the responses.

4 Data Analysis

To evaluate the hypotheses, a two-step maximum likelihood method employing structural equation modelling by using IBM SPSS 20.0 and AMOS 22 was implemented Anderson and Gerbing [75]. SPSS serves for initial data analysis and demographic profiling, whereas AMOS, an extension within SPSS, is employed for intricate structural equation modeling. To begin, with the help of confirmatory factor analysis (CFA), convergent and discriminant validity of the model were calculated. The research model was assessed in the second phase, and the proposed hypotheses were tested using path analysis. The following section provides a detailed description of the study analysis procedures. Further, parallel mediation was performed using AMOS 22 to examine the indirect relationship [76].

4.1 Measurement Model

We estimated model fit, internal consistency, and validity through confirmatory factor analysis (CFA) [75]. Our CFA results suggest the model's good fit of the data: chi square = 343.210, CMIN/df (minimum discrepancy divided by degree of freedom) = 1.972, CFI (comparative fit index) = 0.962, GFI (goodness of fit index) = 0.880, AGFI (adjusted goodness of fit index) = 0.841, RMSEA (root mean square error approximation) = 0.064, SRMR (standardized root mean residual) = 0.036. Furthermore, to assess the internal consistency, we inspected composite reliability (CR) and observed that all the composite reliability values were above the threshold limit, i.e., 0.7 [77]. The loadings for all the items were found to be significant, and no item was dropped. Finally, the study examined the discriminant validity where the square root of the average variance (AVE) extracted was greater than the correlation between each construct pair [78]. Therefore, based on the goodness of fit criteria, we found that the measurement model has a good fit model (see Table 2).

4.2 Structural Model (Path Analysis)

The hypotheses testing results are shown in Table 3. The results shows that SMMA exhibits favorable effect on InfoQ (H1; estimates = 0.827, S.E. = .061, p < 0.001),

Table 2. Reliability and Validity

	CR	AVE	BL	SMMA	SQ	InfoQ	SysQ	BCE
BL	0.914	0.728	**0.853**					
SMMA	0.922	0.746	0.755	**0.864**				
SQ	0.901	0.751	0.716	0.766	**0.867**			
InfoQ	0.887	0.724	0.742	0.828	0.795	**0.851**		
SysQ	0.886	0.723	0.727	0.839	0.799	0.823	**0.850**	
BCE	0.915	0.729	0.766	0.784	0.776	0.770	0.762	**0.854**

SysQ (H2; estimates $= 0.893$, S.E. $= .061$, $p < 0.001$), SQ (H3; estimates $= 0.734$, S.E. $= .057$, $p < 0.001$). Subsequently, InfoQ (H4; estimates $= 0.315$, S.E. $= 0.081$, $p < 0.001$), SysQ (H5; estimates $= 0.234$, S.E. $= 0.074$, $p < 0.001$) and SQ (H6; estimates $= 0.367$, S.E. $= 0.077$, $p < 0.001$) has favorable effect on BCE respectively. Therefore, H1, H2, H3, H4, H6 were empirically supported. In addition, BCE has a positive effect on BL (H10; estimates $= 0.858$, S.E. $= 0.068$, $p < 0.001$). Thus, the empirical evidence supports the hypotheses.

Table 3. Path analysis

		Estimate	S.E.	C.R.	Std. Estimate	P	Results
H1	SMMA → InfoQ	0.827	.061	13.543	.873	***	Significant
H2	SMMA → SysQ	0.893	.061	14.684	.879	***	Significant
H3	SMMA → SQ	0.734	.057	12.923	.819	***	Significant
H4	InfoQ → BCE	0.315	.081	3.875	.326	***	Significant
H5	SysQ → BCE	0.234	.074	3.172	.260	.002	Significant
H6	SQ → BCE	0.367	.077	4.775	.360	***	Significant
H10	BCE → BL	0.858	.068	12.697	.798	***	Significant

4.3   Parallel Mediation Analysis

A structural analysis employing structural equation modeling was performed to investigate the hypothesized parallel mediation analysis in AMOS 22. The approach utilizes a bias-corrected bootstrapping procedure with a 95 percent confidence interval (CI), drawing 5,000 bootstrap samples from the dataset. The results of the analysis are summarized in Table 4.

The parallel mediation model was used to investigate the mediation effects of InfoQ, SysQ and SQ between SMMA and BCE. The mediation relationship was accepted

Table 4. Parallel mediation analysis

		Estimate	Lower	Upper	p value
H7	InfoQ	.261	.093	.490	.004
H8	SysQ	.209	.016	.416	.038
H9	SQ	.270	.093	.538	.001

when the lower and upper bound of the bootstrap CI of the indirect effects did not include zero (Preacher and Hayes, 2004). The estimated indirect effect of each mediator, represented by its respective path coefficient, conveys details on the strength and direction of the mediation. The analysis revealed significant indirect mediation effects for all three variables, InfoQ (estimates $= 0.261$, LLCI $= 0.093$, ULCI $= 0.490$, $p < 0.05$), SysQ (estimates $= 0.209$, LLCI $= 0.016$, ULCI $= 0.416$, $p < 0.05$), and SQ (estimates $= 0.270$, LLCI $= 0.093$, ULCI $= 0.538$, $p < 0.05$). Therefore, all three variables, InfoQ, SysQ and SQ demonstrated statistically significant mediation effects.

5   Discussions

The research highlights the different dimensions of brand community engagement. Furthermore, the study also investigates the indirect relationship between social media marketing activities and brand community engagement (through information quality, system quality and service quality). The results indicate significant links within the model. The computed path coefficients show the intensity and direction of the correlations between the variables.

The paths from social media marketing activities to information quality, system quality and service quality shows highly significant relation (SMMA $\rightarrow$ InfoQ: $\beta = 0.827$, $p < 0.001$; SMMA $\rightarrow$ SysQ: $\beta = 0.893$, $p < 0.001$; SMMA $\rightarrow$ SQ: $\beta = 0.734$, $p < 0.001$). This indicates that social media marketing activities have a significant positive influence on these dimensions of online brand communities. Brands that use social media marketing activities effectively can convey reliable and pertinent data (InfoQ), improve opinions of users about system efficiency (SysQ) and acquire reputation for excellent service (SQ), Thereby, encouraging positive environment within the online brand community.

In addition, it was found that information quality, system quality and service quality have a significant relation with brand community engagement (InfoQ $\rightarrow$ BCE: $\beta = 0.734$, $p < 0.001$; SysQ $\rightarrow$ BCE: $\beta = 0.234$, $p = 0.002$; SQ $\rightarrow$ BCE: $\beta = 0.367$, $p < 0.001$). The positive impact shows that high-quality reliable information, efficient system, and exceptional customer service have a favorable impact on community engagement. Brands should not only optimize social media content, but also devote time to efficiency and quality of the operational system and services.

Moreover, the relationship between brand community engagement and brand loyalty was found to be highly significant BCE $\rightarrow$ BL: $\beta = 0.858$, $p < 0.001$), revealing that the pivotal role of community engagement in cultivation brand loyalty. Thus, brands should invest in initiatives that stimulate engagement in online brand communities.

We also examined the parallel mediating impact of information quality, system quality and service quality on social media marketing activities and brand community engagement. It is the aggregate impact of several mediators acting concurrently in explaining how an independent variable (social media marketing activity) influences a dependent variable (brand community involvement). Brand should focus on relevant content, smooth navigation and convenient interaction while marketing their products to fosters engagement in online brand communities.

5.1 Theoretical Implications

The theoretical contributions of this research are twofold. First this study contributes to the brand community engagement by investigating the parallel mediation effects of information quality, system quality and service quality on social media marketing activities and brand community engagement. Information quality and service quality showed significant effects on community engagement. This contributes to a better understanding of how these quality dimensions function as underlying processes. Furthermore, it's worth noting that most past studies on information quality, system quality, and service quality have mostly focused on user satisfaction [79, 80]. The current study, on the other hand, takes a novel approach by studying the impact of these quality factors on engagement in the online brand community, which in turn influences brand loyalty. This shift in emphasis helps to a better understanding of the patterns that influence brand community engagement and loyalty, opening new opportunities for research in this field. Additionally, incorporating social media marketing activities, information quality, service quality and system quality as stimulus in S-O-R framework offers a holistic view of stimuli influencing customer experience.

5.2 Practical Implications

The study emphasizes the importance for marketers to recognize the tactical role of social media marketing activities in enhancing brand community engagement and brand loyalty. Instead of considering social media marketing as merely another promotional channel for reaching customers (Cheung et al. 2020), brand should take strategic approach to implement it to enhance not only their promotional endeavors but also the wider facets of information, services, and system quality they offer to their customers. Brands should position their social media brand pages as a platform that offers guidance to resolve customer concerns pertaining to their branded products. Additionally, marketers can also set guidelines and norms that encourage members to contribute correct and comprehensive information. For this, incentive mechanisms such as badges and elevated status can be used. This would substantially increase community engagement. Moreover, incorporating community-driven feedback into creation and implementation of products and services can result in boosting brand loyalty. Brands may consider building a feedback loop in which they proactively handle the preferences and concerns of community members. This iterative approach not only develops a cooperative environment but also demonstrates a commitment to fulfill changing demands of the community, ultimately fostering loyalty.

6　Conclusion and Limitations

This study investigated the complex links between Social Media Marketing Activities (SMMA), Information Quality (InfoQ), System Quality (SysQ), and Service Quality (SQ), Brand-Community Engagement (BCE), Brand Loyalty (BL). Through rigorous examination and analysis, we have uncovered valuable insights into how these factors interplay within the contemporary landscape of online brand communities. The study underscores the relevance of information quality, service quality and system quality for marketers to engage customers. The implications drawn from this study should be viewed considering certain limitations. Primarily, the research was conducted within the boundaries of an online brand community, without specific emphasis on any platform. Consequently, it is recommended that forthcoming research endeavors broaden their scope to encompass a variety of platforms, including e-commerce platforms, facebook, Instagram, product categories or multiple brands. In our study, we focused solely on brand loyalty as the outcome of brand community engagement. Additionally the research has not delved into particular industry, demographic, or regional contexts. Consequently, the findings may lack contextual specificity and may not be directly transferable to diverse settings. Future study should include context-specific analysis to improve knowledge of social media marketing and brand community engagement in various circumstances. However, future studies can consider additional dependent variables such as brand awareness, brand trust, purchase intention. Also, researchers can construct a comprehensive model showing an intricate relationship between social media marketing activities and brand community engagement. Additionally, as the sampling frame predominantly comprises students, the study's limitation lies in its deliberate focus on unmarried individuals with an annual income of less than 5 lakhs. This focus limits the generalizability of findings to a wider population. Therefore, a more diversified sample should be sought for future study.

References

1. Li, F., Larimo, J., Leonidou, L.C.: Social media marketing strategy: definition, conceptualization, taxonomy, validation, and future agenda. J. Acad. Mark. Sci. **49**, 51–70 (2021)
2. Shawky, S., Kubacki, K., Dietrich, T., Weaven, S.: A dynamic framework for managing customer engagement on social media. J. Bus. Res., S014829632030196X (2020). https://doi.org/10.1016/j.jbusres.2020.03.030
3. Hanson, S., Jiang, L., Dahl, D.: Enhancing consumer engagement in an online brand community via user reputation signals: a multi-method analysis. J. Acad. Mark. Sci. **47**, 349–367 (2019)
4. Rosado-Pinto, F., Loureiro, S.M.C.: The growing complexity of customer engagement: a systematic review. EuroMed J. Bus. **15**(2), 167–203 (2020)
5. Kaur, H., Paruthi, M., Islam, J., Hollebeek, L.D.: The role of brand community identification and reward on consumer brand engagement and brand loyalty in virtual brand communities. Telemat. Inform. **46**, 101321 (2020)
6. Hollebeek, L.D., et al.: Customer engagement in evolving technological environments: synopsis and guiding propositions. Eur. J. Mark. **53**(9) (2019)

7. Nadeem, W., Khani, A.H., Schultz, C.D., Adam, N.A., Attar, R.W., Hajli, N.: How social presence drives commitment and loyalty with online brand communities? The role of social commerce trust. J. Retail. Consum. Serv. **55**, 102136 (2020)

8. Baldus, B.J., Voorhees, C., Calantone, R.: Online brand community engagement: scale development and validation. J. Bus. Res. **68**(5), 978–985 (2015). https://doi.org/10.1016/j.jbusres.2014.09.035

9. Zhao, X., Chen, Y.R.R.: How brand-stakeholder dialogue drives brand-hosted community engagement on social media: a mixed-methods approach. Comput. Hum. Behav. **131**, 107208 (2022)

10. Dessart, L.: Social media engagement: a model of antecedents and relational outcomes. J. Mark. Manag. **33**(5–6), 375–399 (2017). https://doi.org/10.1080/0267257X.2017.1302975

11. Kumar, J., Kumar, V.: Drivers of brand community engagement. J. Retail. Consum. Serv. **54**, 101949 (2020)

12. Santos, Z.R., Cheung, C.M., Coelho, P.S., Rita, P.: Consumer engagement in social media brand communities: a literature review. Int. J. Inf. Manag. **63**, 102457 (2022)

13. Yadav, M., Rahman, Z.: The influence of social media marketing activities on customer loyalty: a study of e-commerce industry. Benchmarking Int. J. **25**(9), 3882–3905 (2018)

14. Naqvi, M.H.A., Jiang, Y., Naqvi, M.: Generating customer engagement in electronic-brand communities: a stimulus–organism–response perspective. Asia Pac. J. Mark. Logist. **33**(7), 1535–1555 (2021)

15. Yum, K., Yoo, B.: The impact of service quality on customer loyalty through customer satisfaction in mobile social media. Sustainability **15**(14), 11214 (2023)

16. Fetais, A.H., Algharabat, R.S., Aljafari, A., Rana, N.P.: Do social media marketing activities improve brand loyalty? An empirical study on luxury fashion brands. Inf. Syst. Front. **25**(2), 795–817 (2023)

17. Kang, J.Y.M., Kim, J.: Online customer relationship marketing tactics through social media and perceived customer retention orientation of the green retailer. J. Fash. Mark. Manag. Int. J. **21**(3), 298–316 (2017)

18. Mehrabian, A., Russell, J.A.: An Approach to Environmental Psychology. MIT Press, Cambridge (1974)

19. Sohaib, M., Safeer, A.A., Majeed, A.: Role of social media marketing activities in China's e-commerce industry: a stimulus organism response theory context. Front. Psychol. **13**, 941058 (2022)

20. Aljuhmani, H.Y., Elrehail, H., Bayram, P., Samarah, T.: Linking social media marketing efforts with customer brand engagement in driving brand loyalty. Asia Pac. J. Mark. Logist. **35**(7), 1719–1738 (2023)

21. Tak, P., Gupta, M.: Examining travel mobile app attributes and its impact on consumer engagement: an application of SOR framework. J. Internet Commer. **20**(3), 293–318 (2021)

22. Ali, F., Terrah, A., Wu, C., Ali, L., Wu, H.: Antecedents and consequences of user engagement in smartphone travel apps. J. Hosp. Tour. Technol. **12**(2), 355–371 (2021)

23. Zhu, L., Li, H., Wang, F.K., He, W., Tian, Z.: How online reviews affect purchase intention: a new model based on the stimulus-organism-response (S-O-R) framework. Aslib J. Inf. Manag. **72**(4), 463–488 (2020)

24. Islam, J.U., Rahman, Z.: The impact of online brand community characteristics on customer engagement: an application of stimulus-organism-response paradigm. Telemat. Inform. **34**(4), 96–109 (2017)

25. De Luca, R., Botelho, D.: The unconscious perception of smells as a driver of consumer responses: a frame work integrating the emotion-cognition approach to scent marketing. AMS Rev. **11**(1), 145–161 (2021)

26. Islam, J.U., Shahid, S., Rasool, A., Rahman, Z., Khan, I., Rather, R.A.: Impact of website attributes on customer engagement in banking: a solicitation of stimulus-organism-response theory. Int. J. Bank Mark. **38**(6), 1279–1303 (2020)
27. Kumar, J., Nayak, J.K.: Understanding the participation of passive members in online brand communities through the lens of psychological ownership theory. Electron. Commer. Res. Appl. **36**, 100859 (2019)
28. Brodie, R.J., Hollebeek, L.D., Jurić, B., Ilić, A.: Customer engagement: conceptual domain, fundamental propositions, and implications for research. J. Serv. Res. **14**(3), 252–271 (2011)
29. Habibi, M.R., Laroche, M., Richard, M.O.: The roles of brand community and community engagement in building brand trust on social media. Comput. Hum. Behav. **37**, 152–161 (2014)
30. Schmitt, B.: The consumer psychology of brands. J. Consum. Psychol. **22**(1), 7–17 (2012)
31. Kusumasondjaja, S.: Exploring the role of visual aesthetics and presentation modality in luxury fashion brand communication on Instagram. J. Fash. Mark. Manag. Int. J. **24**(1), 15–31 (2020)
32. Koay, K.Y., Ong, D.L.T., Khoo, K.L., Yeoh, H.J.: Perceived social media marketing activities and consumer-based brand equity: testing a moderated mediation model. Asia Pac. J. Mark. Logist. **33**(1), 53–72 (2020)
33. Cheung, M.L., Pires, G., Rosenberger, P.J.: The influence of perceived social media marketing elements on consumer–brand engagement and brand knowledge. Asia Pac. J. Mark. Logist. **32**(3), 695–720 (2020)
34. Yadav, M., Rahman, Z.: Measuring consumer perception of social media marketing activities in e-commerce industry: scale development & validation. Telemat. Inform. **34**(7), 1294–1307 (2017)
35. Kim, A.J., Ko, E.: Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand. J. Bus. Res. **65**(10), 1480–1486 (2012)
36. Seo, E.J., Park, J.W.: A study on the effects of social media marketing activities on brand equity and customer response in the airline industry. J. Air Transp. Manag. **66**, 36–41 (2018)
37. Godey, B., et al.: Social media marketing efforts of luxury brands: influence on brand equity and consumer behavior. J. Bus. Res. **69**(12), 5833–5841 (2016)
38. Chen, S.C., Lin, C.P.: Understanding the effect of social media marketing activities: the mediation of social identification, perceived value, and satisfaction. Technol. Forecast. Soc. Change **140**, 22–32 (2019)
39. Moslehpour, M., Dadvari, A., Nugroho, W., Do, B.R.: The dynamic stimulus of social media marketing on purchase intention of Indonesian airline products and services. Asia Pac. J. Mark. Logist. **33**(2), 561–583 (2021)
40. Zheng, Y., Zhao, K., Stylianou, A.: The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: an empirical investigation. Decis. Support. Syst. **56**, 513–524 (2013)
41. Casaló, L.V., Flavián, C., Ibáñez-Sánchez, S.: Influencers on Instagram: antecedents and consequences of opinion leadership. J. Bus. Res. **117**, 510–519 (2020)
42. Cheung, M.L., Leung, W.K., Aw, E.C.X., Koay, K.Y.: I follow what you post!": the role of social media influencers' content characteristics in consumers' online brand-related activities (COBRAs). J. Retail. Consum. Serv. **66**, 102940 (2022)
43. Lin, H., Fan, W., Chau, P.Y.K.: Determinants of users' continuance of social networking sites: a self-regulation perspective. Inf. Manag. **51**(5), 595–603 (2014)
44. Cao, X., Gong, M., Yu, L., Dai, B.: Exploring the mechanism of social media addiction: an empirical study from WeChat users. Internet Res. **30**(4), 1305–1328 (2020)
45. Zeithaml, V.A., Parasuraman, A., Malhotra, A.A.: A Conceptual Framework for Understanding E-Service Quality: Implications for Future Research and Managerial Practice. Marketing Science Institute, Cambridge (2000)

46. Luo, N., Wang, Y., Zhang, M., Niu, T., Tu, J.: Integrating community and e-commerce to build a trusted online second-hand platform: based on the perspective of social capital. Technol. Forecast. Soc. Change **153**, 119913 (2020)
47. McKinney, V., Yoon, K., Zahedi, F.M.: The Measurement of web-customer satisfaction: an expectation and disconfirmation approach. Inf. Syst. Res. **13**(3), 296–315 (2002). https://doi.org/10.1287/isre.13.3.296.76
48. Aboelmaged, M.G.: Predicting the success of Twitter in healthcare: a synthesis of perceived quality, usefulness and flow experience by healthcare professionals. Online Inf. Rev. **42**(6), 898–922 (2018)
49. Popovic, A., Habjan, A.: Exploring the effects of information quality change in road transport operations. Ind. Manag. Data Syst. **12**(9), 1307–1325 (2012)
50. Busalim, A.H., Che Hussin, A.R., Iahad, N.A.: Factors influencing customer engagement in social commerce websites: a systematic literature review. J. Theor. Appl. Electron. Commer. Res. **14**(2) (2019). https://doi.org/10.4067/s0718-18762019000200102
51. DeLone, W.H., McLean, E.R.: Measuring e-commerce success: applying the DeLone and McLean information systems success model. Int. J. Electron. Commer. **9**(1), 31–47 (2004)
52. Barreda, A.A., Bilgihan, A., Nusair, K., Okumus, F.: Generating brand awareness in online social networks. Comput. Hum. Behav. **50**, 600–609 (2015)
53. Jang, H., Olfman, L., Ko, I., Koh, J., Kim, K.: The influence of online brand community characteristics on community commitment and brand loyalty. Int. J. Electron. Commer. **12**(3), 57–80 (2008)
54. de Oliveira, M.J., Huertas, M.K.Z., Lin, Z.: Factors driving young users' engagement with Facebook: evidence from Brazil. Comput. Hum. Behav. **54**, 54–61 (2016)
55. Parasuraman, A., Zeithaml, V.A., Berry, L.L.: A conceptual model of service quality and its implications for future research. J. Mark. **49**(4), 41–50 (1985)
56. Liang, T.P., Ho, Y.T., Li, Y.W., Turban, E.: What drives social commerce: the role of social support and relationship quality. Int. J. Electron. Commer. **16**(2), 69–90 (2011)
57. Roy, S.K., Balaji, M.S., Soutar, G., Lassar, W.M., Roy, R.: Customer engagement behavior in individualistic and collectivistic markets. J. Bus. Res. **86**, 281–290 (2018)
58. Roy, S.K., Shekhar, V., Lassar, W.M., Chen, T.: Customer engagement behaviors: the role of service convenience, fairness and quality. J. Retail. Consum. Serv. **44**, 293–304 (2018)
59. Lee, Z.W., Chan, T.K., Chong, A.Y.L., Thadani, D.R.: Customer engagement through omnichannel retailing: the effects of channel integration quality. Ind. Mark. Manag. **77**, 90–101 (2019)
60. Abror, A., Patrisia, D., Engriani, Y., Evanita, S., Yasri, Y., Dastgir, S.: Service quality, religiosity, customer satisfaction, customer engagement and Islamic bank's customer loyalty. J. Islamic Mark. **11**(6), 1691–1705 (2020)
61. Chang, C.W., Huang, H.C., Wang, S.J., Lee, H.: Relational bonds, customer engagement, and service quality. Serv. Ind. J. **41**(5–6), 330–354 (2021)
62. Fan, X., Ning, N., Deng, N.: The impact of the quality of intelligent experience on smart retail engagement. Mark. Intell. Plan. **38**(7), 877–891 (2020)
63. Prentice, C., Wang, X., Loureiro, S.M.C.: The influence of brand experience and service quality on customer engagement. J. Retail. Consum. Serv. **50**, 50–59 (2019)
64. Utami, A.F., Ekaputra, I.A., Japutra, A., Van Doorn, S.: The role of interactivity on customer engagement in mobile e-commerce applications. Int. J. Mark. Res. **64**(2), 269–291 (2022)
65. Algesheimer, R., Dholakia, U.M., Herrmann, A.: The social influence of brand community: evidence from European car clubs. J. Mark. **69**(3), 19–34 (2005)
66. Sohail, M.S.: Understanding consumer engagement in online brand communities: an application of self-expansion theory. J. Mark. Anal. **11**(1), 69–81 (2023)
67. Lim, W.M., Rasul, T., Kumar, S., Ala, M.: Past, present, and future of customer engagement. J. Bus. Res. **140**, 439–458 (2022)

68. Munnukka, J., Karjaluoto, H., Tikkanen, A.: Are Facebook brand community members truly loyal to the brand? Comput. Hum. Behav. **51**, 429–439 (2015)
69. Liu, L., Liu, R., Lee, M., Chen, J.: When will consumers be ready? A psychological perspective on consumer engagement in social media brand communities. Internet Res. **29**(4), 704–724 (2019)
70. Li, M.W., Teng, H.Y., Chen, C.Y.: Unlocking the customer engagement-brand loyalty relationship in tourism social media: the roles of brand attachment and customer trust. J. Hosp. Tour. Manag. **44**, 184–192 (2020)
71. Shin, H.: Exploring open innovation engagement process of hotel brand community members: motivation, empowerment and consequences. Int. J. Contemp. Hosp. Manag. (2023)
72. Campbell, S., et al.: Purposive sampling: complex or simple? Research case examples. J. Res. Nurs. **25**(8), 652–661 (2020)
73. Garland, R.: The mid-point on a rating scale: is it desirable. Mark. Bull. **2**(1), 66–70 (1991)
74. Ismail, A.R.: The influence of perceived social media marketing activities on brand loyalty: the mediation effect of brand and value consciousness. Asia Pac. J. Mark. Logist. **29**(1), 129–144 (2017)
75. Ailawadi, K.L., Neslin, S.A., Gedenk, K.: Pursuing the value-conscious consumer: store brands versus national brand promotions. J. Mark. **65**(1), 71–89 (2001)
76. Anderson, J.C., Gerbing, D.W.: Structural equation modeling in practice: a review and recommended two-step approach. Psychol. Bull. **103**(3), 411 (1988)
77. Preacher, K.J., Rucker, D.D., Hayes, A.F.: Addressing moderated mediation hypotheses: theory, methods, and prescriptions. Multivar. Behav. Res. **42**(1), 185–227 (2007)
78. Nunnally, J.C.: Psychometric Theory 2nd edn. McGraw-Hill, New York (1978)
79. Fornell, C., Larcker, D.F.: Evaluating structural equation models with unobservable variables and measurement error. J. Mark. Res. **18**(1), 39–50 (1981)
80. Ashfaq, M., Yun, J., Yu, S., Loureiro, S.M.C.: I, Chatbot: modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. Telemat. Inform. **54**, 101473 (2020)
81. Hsieh, S.H., Lee, C.T., Tseng, T.H.: Psychological empowerment and user satisfaction: investigating the influences of online brand community participation. Inf. Manag. **59**(1), 103570 (2022)