The Impact of Value Co-creation on Brand Promotion in Healthy Virtual Brand Community Based on SEM Model

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Abstract—With the advancement of Internet information technology and people's emphasis on healthy lifestyle, healthy virtual brand community has received more and more attention. Based on the service logic, this study takes KEEP community as an example and explores how value co-creation in healthy virtual brand community leads to related behaviors of brand promotion (brand defense and brand advocacy) by constructing SEM model. The results indicate that customer brand engagement plays a complete mediating role in value co-creation on brand defense, and a partial mediating role in value co-creation on brand advocacy. Moreover, community support plays a moderating role between customer brand engagement to brand defense and customer brand engagement to brand advocacy. This study enriches the relevant literature on value co-creation in virtual brand communities and also provides a reference for corporate brand promotion.

Keywords-Virtual Brand Community, Value Co-creation, Customer Brand Engagement, Brand Defense, Brand Advocacy, Community Support, SEM.

1 INTRODUCTION

With the rapid development of the Internet and "clouds moving", cyberspace has become an indispensable part of people's work, consumption and entertainment. Drived by the Internet and information technology, the role of consumers in the process of consumption and exchange with enterprises has changed from "passive receiver" to "active co-producer". Along with the emergence of the Internet, Virtual brand community provides a platform for enterprises and customers to bring out value together, and the emergence of virtual brand communities also have a significant impact on brand value [1]. At present, relevant scholars have noted that customers' engagement in value co-creation of virtual brand community can bring performance such as product upgrading, customer loyalty and brand equity to enterprises.

Maintaining health is a global issue. For example, the theme of World Health Day on April 7, 2019 is "Universal Health Coverage". Studies have shown that regular physical fitness activities contribute to maintaining good physical and mental health [2]and preventing various chronic diseases and obesity. In China, the government is also increasingly encouraging fitness activities. The Healthy China 2030 Plan puts forward implementation of the Healthy China national strategy to promote the deep integration of national fitness and national health. In recent years, with the increase of leisure time of Chinese residents and the implementation of

the "National Fitness Strategy", more and more people begun to pay attention to fitness activities, and fitness activities have gradually integrated into people's daily lives.

Based on the advancement of Internet information technology and people increasingly focus on healthy lifestyle, the healthy virtual brand community has emerged. In a good virtual brand community, users are the co-creators of value. Virtual brand relies on users and encourages them to share relevant experience and actively participate in community discussion, so as to develop virtual brand [3]. From this perspective, it is meaningful to study healthy virtual brand community, so this study will focus on healthy virtual brand community. KEEP, which belongs to a healthy virtual brand community, is an APP product that focuses on user's exercise and health. It has a wide range of influence and a large number of loyal users around the world. Therefore, this study chooses the healthy virtual brand community represented by KEEP as the research object, which has certain reference value for the brand promotion behavior of relevant healthy virtual brand communities.

Therefore, based on the service logic framework, this article explores the influence mechanism of value co-creation behavior on brand promotion related behaviors (brand defense and brand advocacy) in a healthy virtual brand community, and considers the mediating role of customer brand engagement and the moderating role of community support. This study through the empirical analysis to verify this hypothesis, and then theoretically enriches the value of virtual brand communities create behavior of related research, also deeply for the enterprise comprehensive understanding and stimulate the customer brand promotion behavior to provide the reference of virtual brand community management for the enterprise provides the marketing strategies.

2 THEORETICAL BACKGROUND

2.1 Service logic

In the service logic, users will apply their acquired skills and knowledge, integrate existing new resources, and generate or directly create value. As a service provider, the service organization should strive to leverage all its resources, processes and capabilities to assist the relevant processes of service users to facilitate VCC. The purpose of marketing is to involve service providers in the customer's process, with service as the enabler and mutually beneficial value creation among the participants [4].

2.2 Value co-creation of virtual brand community

VCC is defined as a process that is shared, collaborative, and generates new value at the same time [5]. VCC has two advanced structures: collaborative production and value-in-use. Therefore, it is also regarded as a kind of formative structure [6]. Co-production includes directly or indirectly "cooperating with customers" or participating in the product/service design process. Value-in-use goes beyond co-production, exchange, and have good service. It requires customers to learn how to use, repair, and maintain a products or service propositions. The VCC of this study is also defined as having two advanced structures.

Drived by the Internet and information technology, the role of consumers in the process of consumption and exchange with enterprises has changed from "passive receiver" to "active co-

producer" [7]. In the virtual brand community, consumers' sharing of brand experience has a positive impact on VCC. And users who interact with the brand will largely invest in VCC resources [8]. However, due to its complexity, this interaction is not fully understood [9].

The development of Internet information technology has made it a general trend for enterprises to build virtual brand communities. Hatch and Schultz [10]show that virtual brand communities provide a significant environment for customers to participate in the co-creation of value through natural openness of communication and cohesion formed due to common brand interests. The emergence of virtual brand community has transformed the process of brand building activities from being dominated by enterprises to the collective interaction of numerous brand stakeholders, which has an important impact on brand value. Therefore, it is meaningful to study value co-creation in virtual brand community. Moreover, there are few relevant literatures specifically aimed at the healthy virtual brand community, so it is valuable to conduct research on it.

2.3 Brand promotion behavior

The behavior of customers beyond word-of-mouth (WOM) is brand promotion, which includes brand advocacy and brand defense [11]. The strongest manifestation of customer's positive WOM behavior and brand advocacy behavior is brand defense behavior, which is a positive attribution of customers in the relationship between themselves and the brand. When a brand faces negative word-of-mouth, brand defense manifests itself in consumer behavior, such as defending the brand [12]. Brand advocacy is considered as a good communication about a brand, which will promote consumers to share a brand with others [13].

2.4 Customer brand engagement

CBE is defined as a customer's resource investment in their brand interaction, emphasizing its interactive nature, which is different from relevant concepts, including involvement or commitment [14]. Furthermore, we usually regard CBE as a multi-dimensional concept. It is defined as the motivation of customers and the psychological state of relying on the brand. It is characterized by the specific level of cognition, emotion and behavior generated in the direct interaction between customers and the brand [15]. However, the relationship between engagement and VCC has not been extensively studied [16].

2.5 Community support

Eisenberger [17]proposed that organizational support refers to the general belief that individuals on how much the organization values their contributions and how much they care about their well-being. According to the theory of organizational support, employees with a high sense of organizational support can obviously perceive the care and recognition of the organization, and will repay the organization with higher work involvement, commitment, performance and more extra-role behaviors. Porter's research [18]shows that when an organization treats customers as its internal members and provides corresponding organizational support, it can enhance the sense of customer identity and enable them to make favorable behaviors for the organization.

In the virtual brand community, the community emphasizes the common consciousness relatively fade, cause consumers to online brand community belonging obviously lower than

offline brand community [19], so it is necessary to study the community support in virtual brand community.

3 HYPOTHESES AND RESEARCH MODEL

Gronroos and Voima pointed out that direct interaction is the key to value co-creation. Therefore, customers are allowed to participate in the service delivery of the brand and create value together with the brand.

Marketing should support the value creation of consumers and facilitate customer participation in VCC by providing resources, VCC can be expanded through direct interaction between customers and brands [4]. From the assumption of service logic, it can be concluded that brand participation in community can be generated by VCC in user domain [20]. Therefore, we recommend

H1. Value co-creation positively affects customer brand engagement.

When customers are satisfied with their brand relationship, they will participate in word-of-mouth activities, and brand defense is the strongest form of positive word-of-mouth [12]. The stronger the defensive capability, it can more from the VCC of the user participating brand . Customers will defense what they help create [21]. This is because in VCC, customers play a very good role in creating value together or sharing experience on social media, resulting in a sense of belonging to the brand [22]. Therefore, we recommend

H2. Value co-creation positively affects brand defense.

Brand advocacy is considered as a good communication about a brand, which will promote consumers to share a brand with others [13]. Notably, the transformation of co-creating brands through UGC will lead to consumer brand advocacy in the online environment [23]. Other studies have shown that value co-creation will also promote users to share brand-related content, which will improve users' brand advocacy behavior [22]. Therefore, we recommend

H3. Value co-creation positively affects brand advocacy.

In CBE literature, when consumers pay close attention to a brand, they are regarded as activists of the brand [15]. Consumers who get along with social self-expression brands are more likely to accept brand misconduct, while consumers who get along with internal self-expression brands are more willing to provide word of mouth for the brand [24].Furthermore, engagement will lead consumers to have a sense of psychological ownership of the brand, thereby encouraging consumers to protect the brand from the influence of competitors [25]. Therefore, we recommend

H4. Customer brand engagement positively affects brand defense.

Customers with high degree of participation are willing to actively promote the brand, based on their opportunities and abilities of social interaction and information exchange in the virtual community [23]. Studies have shown that CBE plays a key role in the birth of online brand advocacy [24]. It may be after the CBE event that consumers will advocate for the brand, and engagement may improve the level of online brand advocacy. Therefore, we recommend

H5. Customer brand engagement positively affects brand advocacy.

From the perspective of social exchange, when the interests of the individual are respected by the organization, there will be a sense of obligation. In turn, this obligation pushes the individual to return in a way that is beneficial to the organization [17]. Similarly, individuals who perceive the support of the community will have a sense of indebtedness, therefore, will have the motivation to resolve this aversion by contributing to the organization [26]. When customers engagement in brand activities, the stronger the community support perceived by customers, the more likely they are to have the identity recognition of the "internal identity person", thus will make relevant behaviors of brand promotion. Therefore, we recommend

H6. Community support has a moderate effect between customer brand engagement and brand defense.

H7. Community support has a moderate effect between customer brand engagement and brand advocacy.

4 METHODOLOGY

4.1 Participants

We surveyed users who have made fitness related decisions in the KEEP virtual community. At first, we did a pre-survey with a small sample, then we modified some problems in the questionnaire design, and finally re-conducted the questionnaire survey. See the appendix for the detailed information of the questionnaire. We published a questionnaire on the KEEP virtual brand community platform and invited users to participate in answering the questionnaire. It takes about 10 minutes for the respondents to fill in the questionnaire. The total sample we collected is 338, excluding 22 invalid samples, the total available sample is 316. The information of interviewees is shown in TABLE 1.

TABLE 1. THE DEMOGRAPHIC COMPOSITION OF SAMPLE.

Age	<18	18-25	25-35	>35
	36(11.4%)	157(49.7%)	92(29.1%)	31(9.8%)
Gender	**Male**	**Female**		
	167(52.9%)	149(47.1%)		
Educational qualification	**High school or below**	**Junior college**	**Bachelor**	**Postgraduate and above**
	13(4.1%)	24(7.6%)	161(51.0%)	118(37.3%)
Income	**<1000**	**1001-3000**	**3001-6000**	**>6000**
	106(33.5%)	85(26.9%)	51(16.1%)	74(23.5%)

4.2 Measures

In order to ensure the reliability and validity of the questionnaire, this study adopted a mature scale, combined with this research situation, and made appropriate revisions to the scale after discussing with scholars in the field. In addition to demographic questions, five maturity scales were used in this study: CBE [15], Brand Defense [21], Brand Advocacy [13], Co-

production and Viu, As Representative of VCC [6], CS [17]. The measurement items adopt a five-point Likert scale, ranging from "strongly agree" to "strongly disagree".
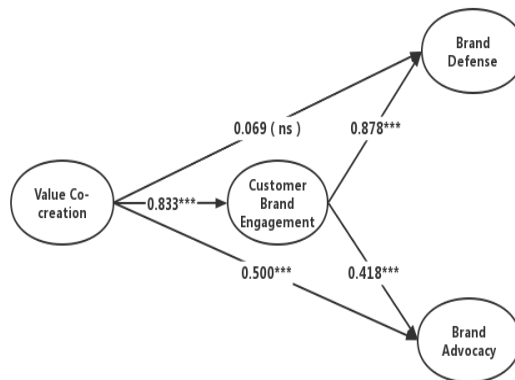
5 RESULTS

The factor loading of the observed variables of each construct in the model are all greater than 0.7, Cronbach's α coefficients are also greater than 0.8, average variance extraction (AVE) values of the structures were all greater than 0.50, and the CR values were all greater than 0.8, which indicates that the variables have better discriminative and convergent validity [27]. These results indicate that the selected factor items match the specified structure.

5.1 The model results

In this study, AMOS24.0 was used to construct the structural equation model and conduct goodness-of-fit statistics. Our model includes value co-creation, customer brand engagement, brand defense, and brand advocacy (i.e., those structures with multi-item measurements), and its statistical data have an ideal goodness-of-fit: the ratio of chi-square to degrees of freedom CMIN/DF=2.515, goodness of fit index GFI=0.833, normed fit index NFI=0.929, non-normal fitting index TLI=0.946, comparative fit index CFI=0.956, root mean square error of approximate RMSEA=0.073 and other indexes, indicating this model fits well.

5.2 Results of hypotheses testing

These results show that (TABLE 2 and Figure 1): VCC has a significant positive effect on CBE (β=1.144, t= 13.559, P <0.001) and brand advocacy (β=0.522, t=4.196, P <0.001), accepting hypothesis H1 and H3. VCC has no significant positive effect on brand defense (β=0.095, t=0.757, p>0.001), and null hypothesis H2 is rejected. The results also show that CBE has significant effects on both brand defense (β=0.923, t=8.524, P <0.001) and brand advocacy (β=0.337, t=3.595, P <0.001), so H4 and H5 are accepted.

Figure 1. Results of hypothesis model. (***p<0.001)

TABLE 2. RESULTS OF HYPOTHESIS MODEL.

Hypothesis	Path	β- value	t-value	Results
H1	VCC ->CBE	0.833	13.559	Accepted
H2	VCC ->BD	0.069	0.757	Unaccepted
H3	VCC ->BA	0.500	4.196	Accepted
H4	CBE ->BD	0.878	8.524	Accepted
H5	CBE ->BA	0.418	3.595	Accepted

Note: VCC: Value co-creation; CBE: Customer Brand Engagement; BD: Brand Defense; BA: Brand Advocacy;

5.3 Mediation analysis

We observed the mediating role of CBE between VCC and brand defense and brand advocacy. We used the Process plugin in SPSS to select Model 4 for perform mediation analysis and obtained 95% bias-corrected bootstrap confidence interval (CI) for the mediation variable. The indirect effect is considered to be significant when the interval of the mediating effect does not include zero. In this study, we used 5000 repeat samples [28] and the results show (TABLE 3) that the indirect effects of CBE, VCC on brand defense (β-indirect effect =0.8682, P <0.05, CI excluding 0) and brand advocacy (β-indirect effect =0.4786, P <0.05, CI excluding 0) are significant. Therefore, CBE mediates the relationship between VCC, brand advocacy, and brand defense. As for the comprehensive direct effect, CBE plays a complete mediating role in VCC's brand defense, and a partial mediating role in VCC's brand advocacy.

TABLE 3. RESULTS OF MEDIATION ANALYSIS.

Parameters	Mediation effects	β	Boot SE	Lower bound 95% BC	Upper bound 95% BC	Result
VCC -CBE -BD	Indirect effects	0.8682	0.1006	0.6861	1.0828	supported
	Direct effects	0.1549	0.0793	-0.0183	0.3281	
VCC -CBE -BA	Indirect effects	0.4786	0.1166	0.2454	0.7000	supported
	Direct effects	0.3627	0.0862	0.1923	0.5330	

Note: VCC: Value co-creation; CBE: Customer Brand Engagement; BD: Brand Defense; BA: Brand Advocacy;

5.4 Moderate analysis

In the moderation analysis, we examined the moderating role of community support from CBE to brand defense and CBE to brand advocacy. We used the Process plugin in SPSS to select Model 14 for perform moderate analysis. The moderating effect is significant in both low-level and high-level CS, because the 95% confidence interval does not include zero (TABLE 4). The results prove that community support can effectively and positively regulate

customer brand engagement to brand defense and customer brand engagement to brand advocacy. Therefore, accept the null hypotheses H6 and H7.

TABLE 4. RESULTS OF MODERATION ANALYSIS

CBE->BD (CS as moderator)					
	Effect	**t**	**P**	**LLCI**	**ULCI**
Low	0.628	6.49	0.000	0.437	0.820
High	0.855	7.73	0.000	0.636	1.073
CBE->BA (CS as moderator)					
	Effect	**t**	**P**	**LLCI**	**ULCI**
Low	0.162	1.495	0.000	0.107	0.452
High	0.398	4.212	0.000	0.211	0.585

Note: VCC: CBE: Customer Brand Engagement; BD: Brand Defense; BA: Brand Advocacy,CS: Community Support; LLCI=Lower level confidence interval; ULCI=Upper level confidence interval;

6 CONCLUSION

Driven by the Internet and information technology, the role of consumers in the process of consumption and exchange with enterprises has changed from "passive receivers" to "active co-producers" [7]. As mobile Internet covers all areas of life, virtual brand communities have become an important way for consumers to interact with brand owners, participate in product design and production, and express their individual needs. The purpose of this study is to clarify the impact of VCC and CBE on consumer brand promotion behavior in virtual brand communities, so as to explore how virtual brand communities can create value for enterprises and consumers and achieve a win-win situation.

Research regards VCC as a high-level concept formed by the two dimensions of collaborative production and use value [6], which proves that consumers' participation in value co-creation contributes to the cognition, emotion and behavior of brand engagement. The virtual brand community builds a convenient and effective direct interaction platform between enterprises and consumers. Consumers can directly express their needs and experience to enterprises anytime and anywhere, as well as the improvement of products and services. Suggest and even directly participate in the product design process to create knowledge and value together. In this process, companies will gradually occupy the minds of consumers, consumers will continue to think about the content of the brand, and actively contribute to the product design of the brand. When consumers spend enough time and energy on a brand, they have become activists of the brand [22]. The study found that CBE plays an absolutely intermediary role between VCC and brand defense. The possible explanation is that brand defense is a higher form of positive word-of-mouth, which requires a deeper connection between consumers and brands. At the same time, the two dimensions of value co-creation, collaborative production and use value are considered. If only part of the co-creation is involved in the use value part, such as product or service experience, etc., it is not possible to establish an effective interaction with the brand, and it will not be enough to produce A sense of belonging to the brand, thereby defending the reputation of the brand.

The study further verified the moderating effect of community support on the process, and found that community support has a positive impact on the path from customer brand engagement to brand defense and customer brand engagement to brand advocacy. When consumers perceive that the community attaches great importance to their contributions and cares about their well-being, they will have a higher sense of belonging and identity, and thus return to the community through more off-role behaviors [17], make more brand promotion behaviors. Therefore, whether it is value co-creation or brand engagement, it is necessary to strengthen direct and repeated interactions with consumers in order to increase consumers' sense of belonging and loyalty to the community and even the brand, and to spontaneously generate brand promotion behaviors and create co-creation with the brand value.

6.1 Theoretical contributions

This research expands the existing literature in two important areas value co-creation and customer brand engagement. First, our research puts the interaction between value co-creation and customer brand engagement in a healthy virtual brand community for verification. In the context of mobile internet, the virtual brand community has become a significant place for consumers to participate in product production and interact with brands and other consumers. Through its natural openness of communication and the cohesion formed based on common brand interests, it provides customers with value for engagement. Co-creation provides an important environment [10]. Therefore, starting from the service logic, studying the impact of value co-creation in this context on positive word of mouth can provide marketers with referable action results.

Second, our research found that community support has a positive effect on the positive impact of customer brand engagement on the brand, enriching the related research on virtual brand community value co-creation.

Finally, brand advocacy and brand defense, as variables that reflect consumers' attitudes and loyalty to the brand, have also received more in-depth research. Our research has also found that active, direct, and repeated interactions can deepen the connection between consumers and the community, and achieve an improvement from brand support to brand defense, resulting in higher brand loyalty, which is conducive to improving brand equity.

6.2 Managerial implications

Our research can provide reference directions for marketers' efforts in virtual brand communities. First of all, marketers should realize that the virtual brand community is an important environment for value co-creation and customer brand engagement, which is conducive to direct interaction between customers and brands. Active interaction is essential for both customers and marketers. Marketers can amplify VCC through direct interaction [4], thereby generating consumer behavior that has a positive impact on the brand—brand promotion behavior, including brand advocacy and brand defense. Therefore, marketers should mobilize consumers to participate in value co-creation activities through active initiation or stimulation, including sharing product experience and feelings, making suggestions on product design or production process, communicating and sharing information with other consumers, and creative use Products, etc.

On the other hand, brand promotion behavior can be promoted through direct and repeated interactions in virtual communities and providing community support. Therefore, in the process of managing virtual brand communities, marketers must actively respond to consumers' sharing and suggestions, create a good atmosphere for discussion and exchange, and actively adopt valuable information and provide feedback to consumers.

6.3 Future research

The research explores interaction between value co-creation and customer brand engagement in the context of virtual brand communities. The healthy brand community KEEP is selected. Although the construction of this community is relatively mature, different industries or the characteristics of different types of virtual communities are different. Future research can verify other types of communities to expand the general applicability of the research results. Our results found that value co-creation only has a positive impact on brand advocacy, which is related to consumers' engagement in value co-creation activities. Future research can explore under what circumstances, and under what variables, can promote consumer behavior from brand advocacy to the stage of brand defense, so as to provide more meaningful references for the practice of virtual brand communities.

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