

# Relationship between Characteristics of Virtual Brand Community and Brand Attachment for Nokia BBS Users

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**Abstract**—Brand attachment is a relationship between the enterprise and consumers which is of a higher level and stronger strength than repeated purchase behavior. Virtual brand community provides a medium of exchange for brand information, experience and feeling for customers, can supply extra brand involvement and brand value, and is an important carrier of the establishment of brand attachment relationship. This paper explores and builds the model of relationship between characteristics of virtual brand community and brand attachment. The characteristics of virtual brand community include participation of community members, quality of information system and community service management etc. And through the survey of random samples of 145 Nokia BBS members, we have found that “community service management, community participation degree and frequency” has significantly positive influence on brand attachment. Therefore, to improve community management and to attract wide participation of users is an effective way of strengthening the brand attachment of consumers to Nokia.

**Index Terms**—virtual community, brand community, characteristics of virtual brand community, brand attachment

## I. INTRODUCTION

With the increasingly fierce market competition and diversification of consumer choice, product innovation becomes much more difficult, and many enterprises begin to shift their business concepts from product sale to customer management. Virtual brand community has emerged with the occurrence of internet. Due to the characteristics of network including convenience, trans-time-space, enormous information, frequent communication and so on, virtual community grows more rapidly than the real community, which breaks through the traditional region-centered community conception [1]. The users of virtual brand community have gathered for the purpose of brand-centered topic and exchanged information, shared experience, communicated emotions and participated in discussion for a long term. In essence, it is another manifestation mode of traditional brand

community. With the rapid development of Internet technology, more and more people join in different kind of virtual brand community and the community has an increasingly profound influence [2].

There are emotions and experiences nature in a virtual community as the real community, the members can mutually influence, share information and mood, satisfy the needs of each other like people in the real community. Virtual brand community provides a medium of brand information, experiences and feelings for customers. Apart from the improvement of brand loyalty, it can provide extra brand involvement and value. Virtual brand community can influence people's perception and behaviors, rapidly spread information, and maximize the support for loyal customers and coordination with them. Virtual brand communities in reality such as the Apple user community, online Java central community of SUN Corporation, European automobile brand community and so on all have a positive influence on brand corporations [3].

This paper focuses on the relationship between the characteristics of virtual brand community and brand attachment for Nokia BBS users. The users of Nokia virtual community were taken as respondents. It aims to help Nokia Corporation which is caught up in danger effectively foster brand attachment through building Nokia virtual community.

## II. LITERATURE REVIEW

### A. Definition of Virtual Brand Community

Virtual brand community is a combination of virtual community and brand community, a sort of virtual network community, such as online Java user community established by SUN Corporation. The brand community formulated by Muniz and O'Quinn was the social relation based on consumer group themed by a certain brand, which goes beyond the limitation of geographic area relating all the consumers who love or use the products of a certain brand [4]. After that, McAlexander, Schouten

and Koenig broadened the concept of brand community [5]. They contended that brand community was not only the relation between consumers, but the consumer-centered relation network including the relations between consumer and brand, consumer and product, consumer and corporation, and consumers. Essentially, brand community is a consumer community with a carrier of brand and its core is the social relations combined by the people who use products of the same brand non-geopolitically.

The study of virtual brand community which was started at the end of 20th century is still in the exploratory stage by now. There are representative scholars such as Wiertz & Ruyter [2], Algesheimer, Dholakia, and Herrmann [3], Bagozzi & Dholakia [6], etc. The scholars generally hold that virtual brand community is the combination of brand community and virtual community and one of the manifestation modes of virtual community. It is a sort of social relation formed by users of a certain brand which carries out social integration through the network media [7]. The members finally feel a sense of belonging by sharing the knowledge and feelings of brand products and having further contact.

#### B. Characteristics of Virtual Brand Community

Virtual brand community has the dual characteristics of brand community and virtual community. It breaks geographic limitation of traditional brand community, making the communication of the members in the community convenient and fast. Today more and more communities have both frequent online communication and offline activities. Virtual community and real community show a trend of integration. Kim, Park & Jin argue that virtual community has the characteristics of sociality and functionality. The former contains goal, person and policy while the latter contains conversation, social support and information navigation [8]. However, the study only aimed at general network community without containing the characteristics of brand community. Reference [9] formulated 4 basic characteristics of virtual brand community including information quality, system quality, interaction and return of activity on the basis of virtual community and brand marketing theories.

Information quality means that community members can get the latest reliable information including the information provided by the corporation and community members [10]. System quality refers to the quality of the BBS website including beauty, convenience, visiting speed etc. Interaction refers to the information and emotion exchange among community members and corporations. For the virtual brand community which carries out offline activities, it also includes the exchange activities of the members in reality. Return of activity refers to the money and psychological return provided for the members who play actively in the community activities, such as material reward, promotion of higher-level members, more rights in the community and so on. And system quality should be paid more attention in virtual community. On the basis of model of information system success of Delone & Mclean [10], Pitt, Watson,

and Kava [11], Negash, Ryan, and Igarria [12] argued that system quality, information quality and service quality had influence on information system effectiveness in the environment of customer support system based on website. They divided system quality into three variables including system quality, information quality and service quality.

According to the above analysis, this paper treats member participation, quality of information system and community service management as the main characteristics of virtual brand community. Member participation includes participation frequency and degree; quality of information system includes system quality, information quality and service quality; community service management includes interaction and return of activity.

#### C. Brand Attachment

As a new concept of marketing, brand attachment is rooted in the classic attachment theory and represents the essence of mental activity of consumers. Schultz wrote a doctoral dissertation named *An Empirical Investigation of Person-Material Possession Attachment* in 1989, symbolizing that attachment theory had entered into the study of consumer behavior from the field of psychology [13]. Most scholars agree that brand attachment is a multidimensional concept.

Park, MacInnis and Priester developed measurement scale of consumer brand attachment strength from three aspects of "emotion, passion and relevance" [14]. Emotion included the items of kindness, love, friendliness and peace, reflecting a certain consumers' favorable impression on brand; passion included enthusiasm, happiness and fascination, reflecting strong and positive feeling of brand; relevance included association, contract and connection, describing correlation between consumers and brand. Matthew & Park contended that brand attachment could describe different aspects of emotion relationship between consumers and brand, such as relation persistence, sublimation of value, expression of identity etc. There were 6 aspects of brand attachment including enjoyment, cognition, contact, nostalgia, self-expression and relation persistence [15]. Seen from the opinions of above scholars, brand attachment is not a single dimensional concept only involved in emotion, but a multi-dimensional concept containing cognition, emotion, intention and other factors.

### III. THEORETICAL MODEL AND METHODOLOGY

#### A. Formulation of Conceptual Model

The characteristics of virtual brand community include characteristics of virtual community and brand community. Jang etc. formulated 4 basic characteristics of virtual brand community including information quality, system quality, interaction, and return of activity [9]. In order to show the characteristics of a virtual community, it's important to introduce information system success model given by Negash, Ryan, and Igarria [12]. Information quality and system quality in the model of

characteristics of virtual brand community of Jang etc plus service quality belonged to “quality of information system”. Interaction and return of activity are integrated into “community service management”. According to the study of community participation of Chou & Lii [16], “participation of community members” is introduced, including participation frequency and degree. Therefore, the characteristic dimensions of virtual brand community have three aspects including member participation, quality of information system, and community service management.

According to the study of Park, MacInnis and Priester [17], Tian Yang, Wang Haizhong and Wang Jing [18], brand attachment has three aspects including brand emotion, brand passion and brand relevance. Thus we construct the theoretical model of the relationship between characteristics of virtual brand community and consumer brand attachment, which is shown in Fig. 1.

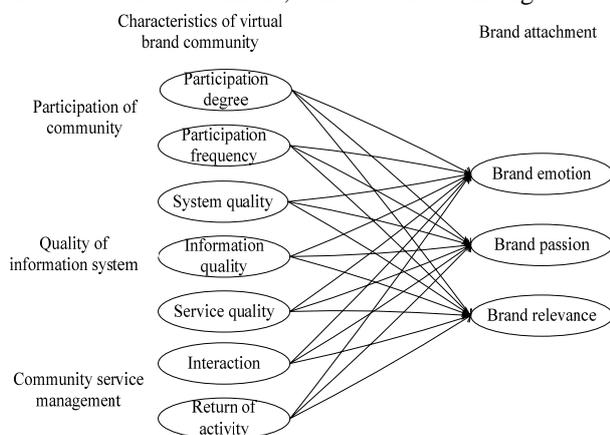


Figure 1. Theoretical model of characteristics of virtual brand community and consumer brand attachment

**B. Variables Measurement**

This paper selects virtual brand community for Nokia phones (<http://www.nokiabbs.com>) as the object mainly because there are many members and frequent activities in the community. There are a number of people participating in the community every day and there were 10574 people on Sep. 18, 2011, the maximum online record of the community. Measurement scale of characteristics of virtual brand community is shown in Table I.

For the literature on brand attachment, there are 3 representative viewpoints including social cognition theory of Schultz, Kleine and Kerman, emotion association theory of Thomson, MacInnis and Park, and mental process theory of Lacoueilhe. In addition to emotional component, brand attachment should contain component of cognition. Park etc al. supported the viewpoint and they hold that the connection degree can be measured based on the relationship between brand and consumer [6]. EA three factors put forward by Thomson, MacInnis and Priester was selected as the measurement scale of brand attachment, namely, brand emotion, brand passion and brand relevance, which is shown in Table II.

TABLE I. VARIABLE DEFINITION AND MEASUREMENT OF CHARACTERISTICS OF VIRTUAL BRAND COMMUNITY

Variable	Variable definition	Source
Participation frequency	Frequency of discussion participation of community members	Kim, Park & Jin, 2008
Participation degree	Intimate degree of discussion participation of community members	
System quality	Beauty of website design	DeLone & McLean, 1992; Jang etc, 2008
	Speed of website visit	
	Convenience of use of website	
Information quality	Amount of corporation and product information provided by the community	Negash, Ryan, and Igbaria, 2003
	Reliability of information got from community exchange	
Service quality	Service provided by the community such as information notice and consultancy	Pitt, Watson, Kavan, 1995
Interaction	Information exchange between community members	Jang etc, 2008; Tsai, 2011
	Affective communication between community members	
	Information exchange between members and corporation	
Return of activity	Active participants will get material reward	Jang etc, 2008
	Active participants will be promoted to senior members	
	Active participants will be granted more rights	

TABLE II. VARIABLE DEFINITION AND MEASUREMENT OF BRAND ATTACHMENT

Variable	Variable definition	Source
Brand emotion	Nokia brand is amiable	Ball & Tasaki, 1992 [19]; Jiang & Dong, 2008 [20]; Thomson & Park, 2005; Thomson, MacInnis and Priester, 2007
	Nokia brand is friendly	
	I love Nokia brand	
Brand passion	Nokia brand makes me happy	Thomson, MacInnis and Priester, 2007
	Nokia brand makes me peaceful	
	I am addicted to Nokia brand	
Brand relevance	Nokia brand makes me associate myself	Thomson, MacInnis and Priester, 2007
	Nokia brand is closely related to me	

**C. Data Collection**

Three aspects are considered for selecting Nokia BBS community as the object: firstly, the community should be a representative brand community which has steady member group in large scale; secondly, the community should take online virtual community as the main existing way, which shows in all aspects of information system quality and community service management; thirdly, the convenience of getting samples is also considered. Therefore, the target population of this study was Nokia BBS users. They were randomly invited to answer the questionnaires.

The survey was carried out from March to April 2012. Data were collected by issuing messages in BBS and provided online questionnaire through [www.sojump.com](http://www.sojump.com). We took a random sample of consumers who had used and participated in Nokia BBS and took back 146 effective questionnaires.

IV. RESULTS

A. Description of Sample Characteristics

According to the 146 effective questionnaires, the ratio of male to female in the questionnaire survey is about 1:1, which can hardly lead to unreasonable sampling caused by sex difference. The participants are mostly at the age of 18~29 years old, which may be related to zeal for online BBS of young men. In addition, most of them have the degree of junior college or undergraduate, which reflects that the education of participation group of Nokia virtual community is commonly in high degree. From the perspective of participation duration of BBS, the participants who had been members for more than 3 years occupy 32.9% and those for 1~3 years were 30.1%.

B. Factor Analysis

The data were processed with the statistical package SPSS 17.0. We used SPSS software module of exploratory factor analysis to extract the common factors. A principal component analysis with varimax rotations was assessed to identify underlying dimensions of characteristics of virtual brand community. Based on the eigenvalue greater than one, scree-plot criteria, and the percentage of variance criterion, five factors were extracted which explained 70.94% of the total variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.898, which totally agreed with the judgment criterion of higher than 0.80 proposed by Kaiser. The approximate Chi-square of Bartlett's test of sphericity

was significant at level 0.000, indicating that nonzero correlation existed. These two tests suggested that the data are suitable for an exploratory factor analysis. Table III gives the KMO and Bartlett's Test result.

TABLE III.  
KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.898	
Bartlett's Test of Sphericity	Approx. Chi-Square	823.767
	df	253
	Sig.	.000

After several attempts, five common factors including 24 items were retained. The cumulative explanation of variance was up to 70.94%. Table IV gives the abstract of exploratory factor analysis and reliability test results. All items had communalities of extraction greater than 0.7 and factor loading greater than 0.50, which showed that the design of questionnaire has good construct validity. The eigenvalues of these 5 common factors were respectively 9.227, 1.956, 1.779, 1.179, and 1.025. According to the specific meanings of items contained by each factor, they were renamed as "community service management", "community information quality", "community system quality", "community participation degree", and "community participation frequency". The new five variables have a little difference with the seven variables of the theoretical model. Among them, the "community service management" is the combination of service quality, interaction, and return of activity.

TABLE IV.  
ABSTRACT OF FACTOR EXTRACTION OF CHARACTERISTICS OF VIRTUAL BRAND COMMUNITY

Factor name	Content of item	Factor loading				
		1	2	3	4	5
Community service management	Active participants will get higher member grade	.764	.102	.111	.155	.152
	Brand and members exchange much information	.739	.205	.028	.139	.263
	Lots of exchange activities are often held	.732	.285	-.036	.134	.168
	Active participants will get more rights	.720	.085	.155	.191	.191
	Active participants will get material rewards	.661	.203	.037	.472	.014
	Community has powerful search function	.644	.381	.184	.119	.092
	Sufficient information exchange between members	.640	.235	.036	.047	.385
	BBS administrator release latest activity information	.612	.361	.353	.125	.007
Community information quality	Having enough channels for problem consultancy	.543	.341	.388	.141	-.093
	Be able to provide correct information	.223	.847	.108	.022	.091
	Providing timely and latest information	.307	.673	.371	.041	.063
	Providing useful and enough information	.416	.621	.148	.109	.266
	All functions can be operated normally	.250	.603	.454	-.009	.147
Community system quality	Protecting personal information and privacy	.274	.559	-.069	.463	-.033
	The system is not complex	.091	.046	.845	.220	.000
	Easy to read forum contents and words	.037	.199	.784	.097	.269
Community participation degree	Easy to use the community	.236	.429	.610	.081	.232
	Many people read the topics issued	.267	.056	.170	.746	-.040
	Many people reply to the topics issued	.213	-.064	.106	.698	.190
	I usually reply to the topics	.022	.189	.145	.571	.556
Community participation frequency	I visit many sectors of community	.100	.288	.268	.533	.503
	I often use messages to exchange with others	.225	.125	.054	.022	.707
	I often come to browse new information	.352	-.041	.203	.132	.630
	I often participate in offline exchange activities	.005	.251	.069	.122	.507
Eigenvalues		9.227	1.956	1.779	1.179	1.025
Variance (%)		26.46	14.05	11.34	10.16	8.92
Cumulative variance (%)		26.46	40.51	51.86	62.02	70.94

The same method was taken to extract the common factors of brand attachment. Finally 2 factors contained

by 8 measurement items were extracted with the entire factor loading over 0.60. The cumulative variance

explanation rate reached 77.92% (shown in Table V). They were renamed as “brand emotion” and “brand relevance”. Compared with the theoretical model, “brand passion” is merged into “brand emotion”, and “brand relevance” remains unchanged.

TABLE V.  
ABSTRACT OF FACTOR EXTRACTION OF BRAND ATTACHMENT

Factor name	Content of item	Factor loading	
		1	2
Brand emotion	Nokia brand is friendly	.897	.154
	Nokia brand is amiable	.866	.196
	Nokia brand makes me feel at ease	.787	.355
	Nokia makes me happy	.761	.406
	I love Nokia brand	.625	.543
Brand relevance	Nokia brand makes me associate myself	.361	.844
	Nokia brand is closely related to me	.173	.786
	I am addicted to Nokia brand	.283	.840
Eigenvalues		5.032	3.201
Variance (%)		41.79	36.13
Cumulative variance (%)		41.79	77.92

C. Mean Comparison

Community service management, community information quality, community system quality, community participation degree, and community participation frequency constitute 5 characteristics of virtual brand community. The mean and standard deviation can be calculated from the original data of questionnaires. The descriptive statistical results are shown in Table VI.

TABLE VI.  
DESCRIPTIVE STATISTICS OF CHARACTERISTICS OF VIRTUAL BRAND COMMUNITY

Variable name	N	Min.	Max.	Mean	SD
Community service management	145	1.000	5.000	3.139	0.764
Community information quality	145	1.000	5.000	3.302	0.799
Community system quality	145	1.000	5.000	3.039	0.922
Community participation degree	145	1.250	4.500	2.829	0.796
Community participation frequency	145	1.500	5.000	3.203	0.636

According to comparison among means of each variable, it could be found that community information quality, community participation frequency, and community service management are at a relatively high level, but they are only a little higher than the average level. However, the community participation degree is lower than the medium level of Nokia BBS users' expectation.

Brand emotion and brand relevance are 2 dimensions of brand attachment. With the same method, the mean and standard deviation of the two variables can be calculated from the original data. The descriptive statistic results are shown in Table VII. The average values of the variables reflect the degree of brand attachment. Seen from the average value of brand attachment, brand

emotion is at a high level while brand relevance is at a low level.

TABLE VII.  
DESCRIPTIVE STATISTICS OF BRAND ATTACHMENT

Variable name	N	Min.	Max.	Mean	SD
Brand emotion	145	1.000	5.000	3.615	0.833
Brand relevance	145	1.000	5.000	2.945	1.043

D. Regression Analysis

Regression analysis is a statistic method to explore the linear correlation between dependent variables and independent variables. Five dimensions of characteristics of virtual brand community are regarded as independent variables, and two dimensions of brand attachment are regarded as dependent variable. The standardized coefficients and testing results are shown in Table VIII.

TABLE VIII.  
REGRESSION ANALYSIS OF CHARACTERISTICS OF VIRTUAL BRAND COMMUNITY AND BRAND ATTACHMENT

Independent variable	Dependent variable	
	Brand emotion	Brand relevance
Community service management	0.379*** (5.643)	0.214** (2.891)
Community information quality	0.003 (0.048)	0.075 (1.016)
Community system quality	0.095 (1.412)	0.009 (0.128)
Community participation degree	0.172** (2.562)	0.308*** (4.158)
Community participation frequency	0.438*** (6.526)	0.300*** (4.052)
R <sup>2</sup>	0.374	0.237
Adjusted R <sup>2</sup>	0.351	0.209
F	16.598 (0.000)	8.624 (0.000)

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

Some basic results can be drawn from the two regression models. There is significant correlation between community service management and brand attachment. Good service quality is based on good service management which makes the community members have the feeling of intimacy, passion, plain and sincerity, thus improving the degree of brand attachment of community members. Therefore, it is easier for good community service management to get higher brand attachment. The community participation degree and participation frequency have positive influence on brand attachment for Nokia BBS users. The higher community participation degree and frequency usually have higher intention of brand relevance for Nokia community members. Community participation frequency reflects the degree of community members' attachment to the community. The higher participation degree also shows that the members are easier to be attached to the brand. But the significant influence was not found between community information quality, system quality and brand attachment. That may reflect the development of Nokia community was still at the initial stage.

In brief, community service management, community participation degree and community participation frequency have a significant positive influence on brand emotion and brand relevance, while community information quality and community system quality have a certain influence on brand attachment but the influence is not significant. Namely, community service management, community participation degree and community participation frequency have direct influence on the overall brand attachment for Nokia users.

## V. CONCLUSION AND SUGGESTION

With the progress of Internet technology, virtual brand community represents the development trend of future brand community. It is not different from the traditional real community in essence but has the unique pattern. Many enterprises use virtual brand community as an important means of maintaining and improving the relationship between customers and brand. Although some virtual brand communities have succeeded and improved the attachment of consumers to brand, many virtual brand communities have failed to achieve ideal effect. The characteristics of virtual brand community may be the main factors of brand attachment for Nokia BBS community.

Characteristics of virtual brand community can be measured from five aspects of community service management, information quality, system quality, participation degree, and participation frequency. Brand attachment is constituted with brand emotion and brand relevance. Seen from the regression analysis, community service management, community participation degree and community participation frequency have significant positive influence on brand emotion, and community participation degree, community service management and community participation frequency have the influence degree from strong to weak. Community service management, community participation degree and community participation frequency also have significant influence on brand relevance.

In order to promote the level and strength of Nokia customers' brand attachment, the effective ways may strengthen community service management, expand community participation frequency, and improve community image. Firstly, strengthen community service management to form emotional attachment relationship. It is supposed to give priority to good service experience to community members. Community members are encouraged to have active interaction among Nokia community. The Nokia Company tries to provide good conditions and atmosphere for interaction in the community. For instance, the community and company treat and respond to all kinds of opinions and suggestions of community members in time, and hold all forms of online and offline exchange activities to build convenient exchange platform for the members. At the same time, the community could provide robust search and consultancy function for BBS users to get information required. Then the Nokia BBS users will trust and depend on the community. When they meet any problems of

using Nokia, they firstly come to the community to find the answer and solution. Secondly, expand community participation frequency based on high-quality information. Most of members will participate in the community when they have difficulty or need information. Therefore, community development should emphasize the timeliness and reliability of information. For example, it is supposed to issue the latest product information and promotion information in the community, develop different information forums, and protect the personal privacy of community members. A special information record department can be established to ensure that the community can provide useful and enough information for community members to help them solve problems. Finally, make full use of modern multimedia technology to promote the vision and hearing impact to improve Nokia BBS community image. Optimize the server and website resources to provide convenience for consumers when they take exchange activities of information and emotion in the community. These efforts will give consumers a favorable impression on the community, and then convert into Nokia brand attachment.

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