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Smart Community Service Brand Functional Value and Sustainable Brand Relationship—The Mediating Role of Customer Emotional Cognition

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Abstract: More and more companies are developing customer service by building Smart Community Service Brand Platforms (SCSBP). However, the impact of digital platform functions on sustainable brand relationships, and the mediating mechanism of customer's emotional cognition are still unclear. The functional value of digital services in the property service industry focuses on three dimensions, including service efficiency, personalization, and social interaction. Regarding consumers' emotional cognition aspect, we investigate value consistency and brand image. The empirical analysis findings suggest: (1) the functional value of smart community service has a significant positive impact on consumers' emotional cognition and is positively related to the construction of sustainable brand relationships; (2) consumers' emotional cognition of smart community service is positively related to the sustainable brand relationship; (3) consumers' emotional cognition plays a complete mediating role between service efficiency and sustainable brand relationship, demonstrating a partial mediating role between personalization and social interaction aspects of functional value and sustainable brand relationship. This study contributes to the customer-based sustainable brand relationship theory in the digital service environment and provides a reference for companies to continuously improve the SCSBP and customer-based brand construction.

Keywords: smart community; digital service; personalization; social interaction; emotional cognition; sustainable brand relationship

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1. Introduction

With the digitalization of business environment, the brand strategy in service marketing has undergone great changes. Brand communities have become a common way of brand construction, and the interactions between customers–enterprises, customers–brands, and customers–customers are gaining more and more attention. Brand equity is the result of developing brand relationships [1]. The CBBE (Customer-based brand equity) pyramid model proposed by Keller [2] argues that the ultimate goal of brand development is to build a positive relationship based on customer loyalty [3]. Relationship value is the highest level of value construction. It is a key ability for service providers to establish, develop, and maintain long-lasting relationships with their customers [4]. Smart-City construction and a market-oriented development environment urge property companies to seek competitive advantage through smart community service brands (SCSB). More and more property companies have launched digital brand platforms based on smart communities to provide more dynamic and personalized services for community residents through technologies such as the Internet of Things, sensor network and big data integration. A Smart Community Service Brand Platform (SCSBP), in essence, emphasizes the person-oriented approach and promotes the interconnection between online service platforms and

offline entity operations by providing personalized services based on the characteristics of community residents' life needs. To be specific, it provides more conveniently and personalized life services for residents and improves service efficiency and customers' community living experience. It establishes sustainable brand relationships with consumers and makes them generate a sense of belonging and identity to strengthen their brand image and consolidate customer trust. These advantages are helpful to open up a wider market space and get access to growth opportunities. This sustainable brand relationship can be understood as a strong and positive loyalty relationship between customers and brands [2].

Leek and Christodoulides [5] find that the brand functional elements can obtain long-term customer loyalty through high-quality customer service and innovative technologies. The functional design in the digital platform plays an important role in value creation [6]. Consumers' emotions towards brands are a source of added-value and work as an important component of the brand value chain. Hence, emotional branding has become the current influential brand management paradigm [7]. Leek and Christodoulides [5] argue that both functional value and emotional characteristics can promote brand relationship development, and there is a mutual relationship exists between functional and emotional value. If an enterprise would be able to provide functional value to customers, it could help to develop emotional cognition and encourage the development of brand relationships.

Past studies have mostly focused on the construction of brand equity based on brand relationships from the perspectives of brand emotion and brand image [3,8], and few researches explore the impact of functional and experience aspects on sustainable brand relationships [9]. However, the way to build sustainable brand relationships with community residents through the functional value of the SCSBP has become particularly important. Therefore, this research takes the functional value of the smart community service (e.g., service efficiency, personalization, social interaction) as the research object and aims to find the impact of the functional value of the smart community service on the value consistency and brand image of community residents. This research aims to explore whether community residents' emotional cognition based on service value consistency and corporate brand image is conducive to establish sustainable brand relationships. We also check the mediating role of emotional cognition in the relationship between the brand functional value and the sustainable brand relationship of smart community service brands (Figure 1). The empirical findings of the study provide theoretical contributions to branding literature and managerial insights for community service providers.

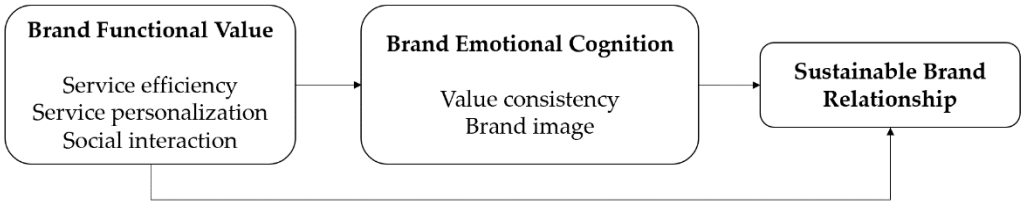


Figure 1. Research framework.

2. Literature Review and Research Hypothesis

2.1. Function Value of Smart Community Service Brand and Sustainable Brand Relationship

The brand functional elements are essential to delivering value to consumers [5], brand equity owns both functional and experience components [10,11], the functional components reflect the internal, objective, utilitarian and tangible aspects of the brand, and the experience components reflect the external, intangible, emotional, and subjective aspects of the brand [8]. Holt et al. [12] believe that the functional value of a brand is a powerful signal to consumers, which is related to a brand's ability to meet consumers' needs [13]. Through the experience of brand function, the quality of the relationship is developed and could be transformed into a positive relationship between consumers, products, and brands [8]. Although these functional values provide opportunities for retaining regular

customers, strengthening the service base, and acquiring new customers [14], they cannot fully explain the relationship attributes that contain consumers and brands together [15].

2.1.1. Service Efficiency and Sustainable Brand Relationship

Boyd et al. [6] find that the launch of mobile Apps increased company value, and the functions emphasized in App design played an important role in the value creation processes. The SCSBP is based on new technologies such as the Internet, APP, cloud computing, and it integrates property management facilities, users, basic services, value-added services, data information, and so on. It is an intelligent, visual, and highly collaborative composite CRM interactive operation system platform. Customers have the opportunities to get assess to various "contact points zone" in the process of applying the smart community service platform. Using this application can enable users to obtain the required information and to perform tasks more effectively [6]. Community residents can enjoy basic property services through the smart community service platform through calling housekeepers, reporting for repairs, online trading, service evaluation, and so on. These different functions can not only improve the quality and efficiency of corporate services but also increase residents' satisfaction. Scientific and technological innovations applied to deploy systems such as smart security, smart access control, and green technology in communities would do good to improve the sense of security and convenience of community residents. While improving the efficiency of basic services, the SCSBP will restructure an ecosystem of value-added services around community life. The logistics and consumer services provided by community platform service providers can ensure the timeliness of commodity transactions [16].

2.1.2. Service Personalization and Sustainable Brand Relationship

Huang and Dev [17] propose the concept of "service brand trinity". This research confirmed that quality, personalization, and relationship are the three important driving factors for the growth of service brands. Moreover, this research recommended building a relationship-based personalization service, and maintain a consistent service quality throughout the whole relationship. The "people-oriented" concept of community service pays more attention to providing personalized services based on the characteristics of community residents' life service needs [3]. Prahalad and Ramaswamy [18], advocate to embed the value creation concept in personalized experience and to integrate resources as well as create value through activities such as build relationships, communicate and improve customer awareness [19]. The value-added services provided by smart communities are mainly based on customized services in household services, housing economy, e-commerce services, housekeeping services, community education, and community pension program that closely related to the lives of community residents. The life problems of residents in different communities are expected to be solved. The smart community service platform integrates with humanistic care and public choice to achieve transparent services in whole processes. Moreover, the platform can also improve the residents' information collection, solve problems timely and facilitate residents to live a better life [16]. A higher level of customization means better functions and brand experience, which helps enterprises to acquire the opportunity to obtain a higher level of relationship value [20].

2.1.3. Social Interaction and Sustainable Brand Relationship

There is a high degree of interaction and social network characteristics between communities on the same platform [21,22]. Consumers can communicate with each other to seek "link value", which in turn encourages customers to interact with other customers to obtain the functional value (such as problem-solving, specific queries, search for brand-related information, etc.) [23]. Luo et al. [24] believe that on social media, consumers can continue to interact with other consumers and gain an in-depth understanding of the brand, thereby it is convenient to enhance the connection between consumers–brands and consumers–consumers. Brand behaviors and user actions in social interactions help spread

word of mouth, which leads to a higher brand relationship value [25]. Court et al. [26] point out that the social-oriented features on the brand platform enable customers to use social media to post comments or read other people's comments at any time to increase participation in the entire process. Customers can manage their identities through social interaction in Apps and establish a stronger connection with the brand [6]. Carlson et al. [20] point out that customer engagement and the process of creating brand value can be directly transformed into a customer–brand relationship, and companies can design brand applications with multiple functions to enhance value as well as customer engagement. Community residents can register and evaluate community interaction-related activities on the community brand platform. Besides, residents can publish useful life experiences, interesting insights, etc. At the same time, they can also publish information such as idle items or second-hand goods and integrate surrounding commercial resources and city resources. On the community platform, it drives the residents' enthusiasm, forming a harmonious and pleasant living atmosphere. The system provides a platform for information dissemination and acquisition, that is, residents' resources can be shared on the system platform, thereby increasing the residents' sense of living value in the community and activating the interaction between residents. Furthermore, this interaction and participation may be helpful to retain existing customers [27].

The SCSBP will provide a visual, intelligent, and information-based community ecosystem, which is mainly reflected in three aspects: circle-level interaction, neighborhood mutual assistance, and shared mutual benefit, and it will show better growth, better home living, and better neighborhood relationship. In the virtual brand community, the willingness of customers to participate in the collaborative value creation will be affected by subject factors, environmental factors, brand factors, and perceived value factors [28]. Consumer engagement and comment reading will affect brand equity [29]. Previous research found consumer engagement of brand WeChat account affects relationship quality and consumers' overall purchase intention, and it also mediates the impact of perceived value on the two factors [30]. The research findings of Zhang and Jiang [31] show enterprise-employee interaction can promote the formation of internal brand equity. Moreover, employee-customer interaction can enhance brand association, promote brand response and cultivate brand relationship assets. Boyd et al. [6] find that functional values such as customer interactions between various "touchpoints" of mobile applications and brands play an important role in the value creation processes of a company. For service-oriented companies, company value is based on the value of brand relationships. Based on this, it is necessary to explore and demonstrate the impact of smart community service brand function value on sustainable relationship value, and here we propose the following hypotheses:

Hypothesis 1a (H1a). *The service efficiency of the SCSBP's function is positively related to sustainable brand relationships.*

Hypothesis 1b (H1b). *The service personalization of the SCSBP's function is positively related to sustainable brand relationships.*

Hypothesis 1c (H1c). *Social interaction on the SCSBP is positively related to sustainable brand relationships.*

2.2. Functional Value of Smart Community Service Brand and Brand Emotional Cognition

There is a correlation between brand functional and emotional quality. Enterprise's choice to provide functional value obviously can help to develop emotional value and may make some consumers more likely to accept products or services [5]. Delgado-Ballester et al. [9], support that experience and functional elements have different influences on consumers' responses to brands. Functional value cannot fully explain the versatility of the relationship between consumers and brands [15]. The experience component reflects the external, intangible, emotional, and subjective aspects of the brand, such as the perceived

image [10,32]. Chen's research finds that through functional experience, relationship quality is developed and transformed into the relationship between consumers, products, and brands [8]. The functional and emotional qualities contained in the brand could encourage the development of this relationship, and trust can be conveyed through brand functional elements [5], Jensen and Klastrup [33] assert that brand value promotes the transition from the value of goods and services to the value of relationships. The smart community provides residents with an information exchange platform, helps to establish online and offline resource sharing mechanisms for community residents and collects residents' suggestions and encourages them to participate in online discussions and resource usage. Community-themed activities can promote related community members to participate in social activities and strengthen interpersonal communication, which also helps to promote community unity and make residents generate a stronger sense of identity and greater engagement willingness [16].

Consumers' transaction behavior is not only affected by the functional (or utilitarian) attributes of the physical object or service but also by the symbolic meaning of value [34,35]. Value perceptions are very useful for measuring product choices because they play a central role in the cognitive structure of consumers [36]. Consumer brand value consistency describes the similarity between consumers' values and service brand values. Zhang et al. [37] find that the development of brand functions that conform to consumer values may have an important impact on the relationship between consumers and service brands. Based on this, it is essential to explore the impact of the functional value of the smart community service brand on the emotional perception of value consistency, we propose the following hypotheses:

Hypothesis 2a (H2a). *The service efficiency of the SCSBP's function positively affects the consumers' perception of value consistency.*

Hypothesis 2b (H2b). *The service personalization of the SCSBP's function positively affects the consumers' perception of value consistency.*

Hypothesis 2c (H2c). *Social interaction on the SCSBP positively affects the consumers' perception of value consistency.*

Park et al. [38] demonstrate that brand image is a subjective perception, which is a kind of understanding of consumers resulting from brand-related activities, to be specific, it is a collection of functional and non-functional related information that connected with products or services in consumers' memories [13,39]. When the service attributes are difficult to evaluate, the brand image will affect the customer's purchase choice, and it will also affect the customer's perception of the goods and services provided by the company [40]. The establishment of a strong brand image will lead to consumer preference and loyalty, thereby generating credibility and ultimately enabling the company to obtain a sustainable competitive advantage [8]. Brand image is a prerequisite for value and loyalty [41]. Kumar et al. [42] agree that different dimensions of brand experience have various effects on consumer–brand relationships, and these dimensions are important tools for the development of long-term consumer–brand relationships. Based on this, it is necessary to verify the impact of the functional value of the smart community service brand on the emotional perception of brand image, and we propose the following hypotheses:

Hypothesis 3a (H3a). *The service efficiency of the SCSBP's function positively affects consumers' brand image perception.*

Hypothesis 3b (H3b). *The service personalization of the SCSBP's function positively affects consumers' brand image perception.*

Hypothesis 3c (H3c). *Social interaction on the SCSBP's positively affects consumers' brand image perception.*

2.3. Emotional Cognition of Smart Community Service Brand and Sustainable Brand Relationship

The concept of relationship value is rooted in business and service marketing, and the measurement of relationship value is crucial to the development of organizations in the service environment [8], Jensen and Klastrup [33] support that product quality, difference, and trust are the determinants of consumer–brand relationships through rational and emotional evaluation of brands. The research of Leek et al. [5], agrees that brand value and relationship value are conceptually different, and relationship value is closely related to consumers' emotional needs.

In terms of value consistency, due to the unique nature of the service industry, value consistency is particularly important for service providers to establish and maintain strong relationships with consumers. Value consistency helps to ensure the quality and outcomes of long-term relationships between consumers and service brands, including trust, emotional commitment, and loyalty [37]. Thorbjørnsen et al. [43] find that attitudes towards core values and role models are important determinants of core value behaviors, quality commitment, tradition and authenticity have different effects on the sustainability of the product [44]. Values are conveyed through tangible elements such as consumers' overall experience of the brand, the interaction with employees, external brand communication and service provision [45]. The consistency of values, organizational identity, and positive word-of-mouth have had a theoretical and management impact on the brand [46]. When a company and brand community members similarly implement cooperative practices, the value co-creation would be successful, and vice versa [24].

Brand image is considered by Smith et al. [47] as an intangible asset related to value. Brand association affects the image, and establishing a good brand image is usually regarded as part of the company's overall marketing strategy. The image, trust, and reputation delivered through the company's website could have a positive impact on the stakeholder's perception of the brand and the company [48]. Brand image is a prerequisite for value and loyalty [41], proper management of the brand image through social media can create opportunities to improve corporate reputation, brand awareness, and ultimately affect consumer brand loyalty [25].

Based on these concepts, we try to figure out the impact of smart community service brand emotional cognition on sustainable brand relationships, and further we want to explore its mediating effect on the brand functional value and sustainable brand relationships, and we put forward the following hypotheses:

Hypothesis 4a (H4a). *The perception of value consistency of smart community services has a positive impact on sustainable brand relationships.*

Hypothesis 4b (H4b). *Brand image perception of smart community services has a positive impact on sustainable brand relationships.*

Hypothesis 5a (H5a). *The consumers' cognition of the value consistency of smart community services plays an intermediary role between the functional value and the sustainable brand relationship.*

Hypothesis 5b (H5b). *The consumers' recognition of the brand image of smart community service plays an intermediary role between the functional value and the sustainable brand relationship.*

Table 1 provides a summary of the key variables, their definitions, and the sources.

Table 1. Variables and definitions.

Variable	Definition	Author (s)
Sustainable brand relationship	A strong and loyal relationship between customers and brands.	Keller, 2009 [2]
Service efficiency	SCSBP enables customers to obtain information and perform tasks more effectively, which improves service timeliness.	Chen and C.W, 2011 [16]
Service personalization	SCSBP provides customers with personalized service functions based on the relationship, which further improves consumers' brand experience.	Huang and Dev, 2020 [17]
Social interaction	Customers can interact with each other on SCSBP and seek "value of links" to obtain the required functional value.	De Vries and Carlson, 2014 [23]
Value consistency	Brand value consistency is the similarity between consumers' personal value and service brand value.	Brangule-Vlagsma et al., 2002 [36]
Brand image	Brand image is a subjective perception, which refers to the understanding of functional and non-functional information resulting from brand-related activities.	Park et al., 1986 [38]; Aaker, 2009 [39]

Based on the above literature review and hypotheses development, a conceptual model is proposed (Figure 2):

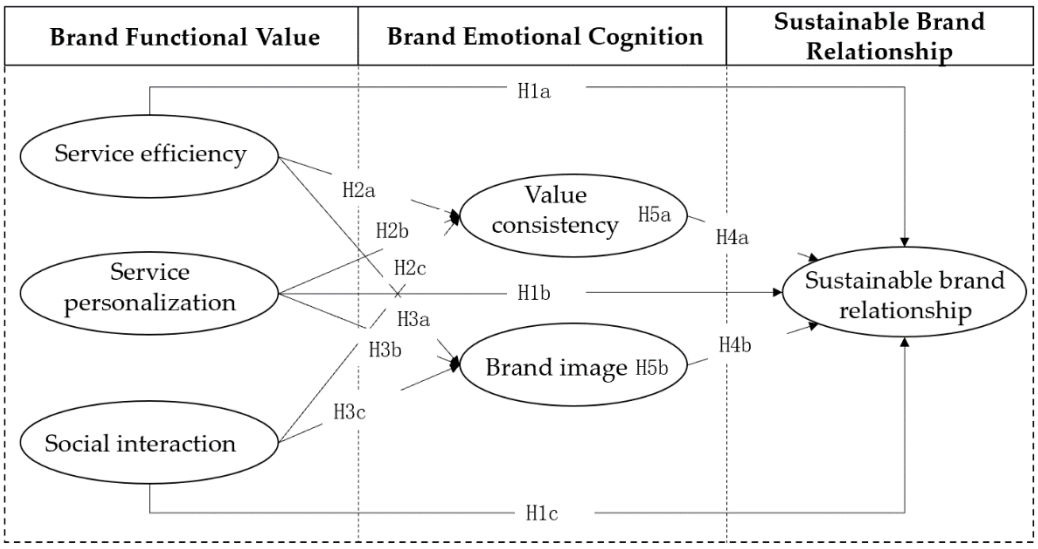


Figure 2. Conceptual model.

3. Research Method

3.1. Sample Description

The survey samples in this study covered community residents in first-, second-and third-tier cities in China. The "Wenjuanxing" platform was used to distribute the questionnaire link to respondents. We received 617 pieces of feedbacks in total, in order to ensure the validity of the data, we deleted the data with consistent answers, and 474 valid questionnaires were finally obtained, the questionnaire validity rate was 76.8%. According to the IP address information of the actual questionnaire respondents, the effective feedbacks came from the first-tier cities account for 61.6%, and the other feedbacks from second or third-tier cities account for 38.4%. Table 2 provides statistics and descriptions from five aspects: resident status, gender, age, education, and annual family income.

Table 2. Description of demographic variables.

Variable	Attribute Value	Frequency	%	Variable	Attribute Value	Frequency	%
Resident Status	Owner	325	68.6	Education	PhD	8	1.7
	Tenant	75	15.8		Master's	36	7.6
	Other	74	15.6		Undergraduate	227	47.9
Gender	Male	247	52.1		Junior College	101	21.3
	Female	227	47.9		Technical Secondary School	102	21.5
Age	≤20	1	0.2	Household Income	Rich	7	1.5
	21–30	86	18.1		Well off	70	14.8
	31–40	179	37.8		Medium	164	34.6
	41–50	114	24.1		General	192	40.5
	51–60	66	13.9		Lower	41	8.6
	≥61	28	5.9	Sample		474	100

3.2. Variable Measurement

The functional value of the smart community service brand is measured in the form of a Likert 5-point scale. The questionnaire used in this research is formed based on the mature scale design of relevant literature in the past, including 23 question items, involving brand relationship, functional value, and emotional recognition. There are 3 measurement dimensions in total.

The brand relationship measurement refers to the relevant measurement indexes proposed by Carlson et al. [20] and Zhang et al. [31]; there are 4 measurement items. The measurement of functional value refers to the relevant measurement indicators proposed by Boyd et al. [6] and Carlson et al. [20], which are respectively measured from three sub-dimensions of service efficiency, personalization, and social interaction; there are 14 measurement questions. The measurement of affective cognition refers to the relevant measurement indexes proposed by Wei et al. [49] and Liu et al. [41] and were measured from the dimensions of value consistency and brand image, 5 measurement questions in total. (Table 3).

Table 3. Measurement problems.

Variable			Measurement Problem	Source
Brand Relationship	Brand Relationship	1	SCSBP developed my good relationship with the brand.	Carlson et al. [30]
		2	SCSBP helps to establish a long-term and stable relationship with me	
		3	SCSBP enhances my sense of belonging and makes me more loyal.	Zhang et al. [31]
		4	I will recommend SCSBP service to my neighbors and friends.	
Functional Value	Efficiency	5	SCSBP's online repair report and payment have improved my life efficiency.	Boyd et al. [6]
		6	Purchasing goods on SCSBP improved the efficiency of my life.	
		7	Choosing and using services such as housekeeping and logistics on SCSBP improved the efficiency of my life.	
		8	Selecting and using services such as community pension program, community education, housing rental, and sale on SCSBP improved the efficiency in my life.	
		9	Completing the payment of water, electricity, gas, heating, and other expenses on SCSBP improved my life efficiency.	
		10	SCSBP is easy to operate, I can quickly search for the information I need.	
	Personalization	11	I can set my common function interface on SCSBP.	
		12	SCSBP will make personalized recommendations for me based on my platform information.	
		13	SCSBP can provide individual services according to my special needs, allowing me to enhance my sense of dignity.	
	Social Interaction	14	I can meet like-minded people on SCSBP.	Carlson et al. [20]
		15	I can learn about and participate in community-organized activities through SCSBP.	
		16	I can interact with neighbors, property service personnel, and community commercial tenants on SCSBP.	
		17	I can express my needs and share my suggestions in SCSBP.	
		18	I am happy to provide constructive advice on SCSBP to improve the brand.	
Emotional Cognition	Value Consistency	19	When participating in the SCSBP service, it will remind me of the service concept they promote.	Wei et al. [49]
		20	The services provided by SCSBP are in line with their promises.	
	Brand Image	21	The more well-known the company, the more I trust the smart services they provide.	Liu et al. [41]
		22	The higher the reputation of the company, the more I trust the smart services they provide.	
		23	When there is a need in my life, I will realize the SCSBP platform firstly.	

We used SPSS21.0 and AMOS21.0 for data analysis, the results show that the measurement questionnaire has good reliability and structural validity. The structural validity of the variables is shown in Table 4.

Table 4. Structural validity fitting index of variables.

x2	df	x2/df	RMSEA	NFI	RFI	IFI	TLI	CFI
673.98	178	3.79	0.077	0.931	0.902	0.948	0.926	0.948

Simultaneously, we conducted descriptive statistics and correlation analysis of each variable, that is, internal consistency analysis. The results are shown in Table 5. Due to the relatively high correlation between some variables, we validated the hypothetical results and analyzes the multicollinearity with the VIF test; the VIF value results are all below 4.0, so the hypothetical results do not have a multicollinearity problem.

Table 5. The mean value, standard deviation, internal consistency coefficient, and correlation analysis of variables.

	M	SD	1	2	3	4	5	6
1. Service Efficiency	4.165	0.662	0.909					
2. Personalization	4.091	0.699	0.979 **	0.776				
3. Social Interaction	4.011	0.703	0.788 **	0.801 **	0.909			
4. Value Consistency	4.211	0.672	0.675 **	0.675 **	0.652 **	0.817		
5. Brand Image	4.110	0.711	0.721 **	0.709 **	0.776 **	0.694 **	0.898	
6. Brand Relationship	4.000	0.719	0.754 **	0.776 **	0.860 **	0.704 **	0.812 **	0.893

Note: ** $p < 0.01$.

This study uses AMOS21.0 and SPSS 25.0 to test Hypotheses 1–4, and the fitting coefficients of the basic model are shown in Figure 3. It can be seen from Figure 3 that in the measurement dimensions of the value of the smart community service function, service efficiency ($\beta = 0.124$, $p < 0.001$), personalization ($\beta = 0.200$, $p < 0.001$), and social interaction ($\beta = 0.682$, $p < 0.001$) (these numbers indicate the direct effect of "X to Y" from regression step 2 to show the hypothesis verification results clearly, using dotted lines in Figure 3) all significantly positively related to sustainable brand relationships; service efficiency ($\beta = 0.299/0.246$, $p < 0.001$), personalization ($\beta = 0.272/0.144$, $p < 0.001$), social interaction ($\beta = 0.187/0.489$, $p < 0.001$) functions have significant positive impacts on the value consistency and brand image in brand emotional cognition aspect; the value consistency ($\beta = 0.133$, $p < 0.001$) and brand image ($\beta = 0.274$, $p < 0.001$) have a significant positive impact on sustainable brand relationship, that is, H1a–1c, H2a–2c, H3a–3c, and H4a–4b have all been verified.

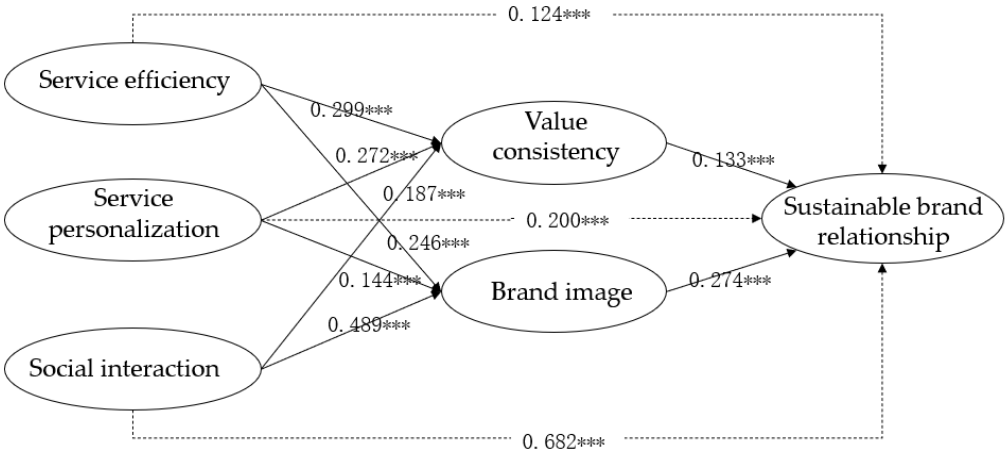


Figure 3. Load factor diagram of the basic model (*** $p < 0.001$).

To verify Hypothesis 5, we put the resident status, gender, education background, and annual family income of the valid sample as control variables and used SPSS25.0 to perform a stepwise regression on the variables and to analyze the mediating effect of brand emotional cognition, that is, we aimed to test whether the functional value of the smart community service brand will affect the sustainable brand relationship through the value consistency and brand image. The results are shown in Table 6. After adding the mediate variables of brand emotional cognition, the regression coefficient β corresponding to service efficiency changes from 0.124 ($p < 0.001$) to 0.017 ($p > 0.05$), which indicates the value consistency of brand emotional cognition and brand image exert complete mediating effects in the construction of sustainable brand relationship based on the efficiency of smart community service, in other words, the efficiency of smart community service can affect sustainable brand relationship through the value consistency and brand image. It is the same for personalization and social interaction dimensions after adding the mediate variables, the regression coefficient β changed from 0.200 ($p < 0.001$) to 0.125 ($p < 0.001$), and the regression coefficient β for social interaction was changed from 0.628 ($p < 0.001$) to 0.469 ($p < 0.001$), indicating that the value consistency and brand image in brand emotional cognition aspect play partial mediating effect in building sustainable brand relationships based on the functional value of personalization and social interaction, that is, smart community services can affect the sustainable brand relationship to a certain extent through the value consistency and brand image. Therefore, $H5_a$ and $H5_b$ have been verified.

Table 6. Analysis of mediation effect.

Independent Variable	**Sustainable Brand Relationship**					
	Step 1		Step 2		Step 3	
Resident Status	−0.001		0.032		−0.150	
Gender	0.019		−0.007		0.018	
Age	−0.029		−0.017		−0.018	
Education	0.065		0.026		−0.014	
Household Income	−0.071	*	−0.010		0.028	
Service Efficiency			0.124	***	0.017	
Personalization			0.200	***	0.125	***
Social Interaction			0.628	***	0.469	***
Value Consistency					0.133	***
Brand Image					0.274	***
F	0.935		506.955	***	51.917	***
Adjust R^2	−0.001		0.764		0.807	
ΔR^2	0.010		0.758	***	0.042	***

Note: * $p < 0.05$, *** $p < 0.001$; $n = 474$.

The research results of variable measurement show that the functional value of smart community service brand (including service efficiency, personalization, and social interaction) has a significant positive effect on the value consistency and brand image in brand emotional cognition aspect and the sustainable brand relationship. The value consistency and brand image are significantly related to the sustainable brand relationships. In terms of service efficiency dimension, mediate variables play a fully mediating role between brand functional value and sustainable brand relationship, and the two variables play a partial mediating role between personalization and social interaction and sustainable brand relationship.

4. Discussion and Future Research

Previous studies have pointed out the interaction between brand function and consumers' emotional cognition [9], such as the functions of mobile applications are vital for

value creation [6]. Functional experience can develop the quality of the relationship and transform it into the relationship between consumers and products as well as brands [14]. The research further explores that the functional value of smart community service brands acts on sustainable brand relationships through value consistency and brand image in consumers' brand emotional cognition.

In the theoretical dimension, on the one hand, our research found that the service efficiency, personalized service, and social interaction of SCSBP not only help to strengthen the value consistency and brand image of the smart community service brand but also contribute to establishing sustainable brand relationships with customers; on the other hand, for the brand owners, customer's value consistency and brand image of the smart community service brand facilitate to build a sustainable brand relationship with the customer. Moreover, consumers' emotional cognition plays an active role in promoting sustainable brand relationships based on the functional value of digital platforms.

In the practical dimension, based on the research conclusions, we suggest that managers should attach great importance to the establishment of sustainable brand relationships in the digital transformation of corporate brands. Firstly, when it refers to the functional design of the brand platform, the company's service concept, service commitment, and brand image information should be reasonably penetrated. Customers will form an individual's perception of value consistency and brand image based on the service efficiency, personalized service, and social interaction of the SCSBP. Functional value and consumers' perceptions will further affect the establishment of sustainable brand relationship; secondly, it is necessary to pay close attention to the interactive impact of the functional value including service efficiency, personalized service, social interaction, and consumers' brand emotional cognition in the digital service brand platform, such as optimizing the service concept based on the customer's perception or evaluation of the functional value, promoting the brand promise or updating the brand image, and so on. Furthermore, enterprises could choose to make innovative and personalized settings for the service functions of the SCSBP according to the service concepts that are highly recognized by customers in the context of digital service, to promote the establishment of sustainable brand relationships with customers.

Limited by the characteristics of sample industries, this study has certain limitations, but it still presents great potential for research focus on the relations between digital platform services and sustainable brand relationships in different industries. In terms of the functional value of smart community service brands, this article combines the characteristics of the sample industry and selects service efficiency, personalization, and social interaction as the research variables. However, it has not considered the functional variables related to the digital service brand platform such as entertainment, rewards, discounts, and search. As for the consumers' brand emotional cognition, this research considers value consistency and brand image in the digitalization process of industry transformation as mediating variables. But we have not referred to hedonic, belonging and some other important consumers' brand emotional cognition variables and their effects on functional value and the sustainable brand relationship of smart community service. Based on the characteristics of different digital service platforms, these variables and various contexts will be interesting and expandable research fields.

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References

1. Grönroos, C. Adopting a service logic for marketing. *Mark. Theory* **2006**, *6*, 317–333. [CrossRef]
2. Keller, K.L. Building strong brands in a modern marketing communications environment. *J. Mark. Comm.* **2009**, *15*, 139–155. [CrossRef]
3. Chekalina, T.; Fuchs, M.; Lexhagen, M. Customer-based destination brand equity modeling: The role of destination resources, value for money, and value in use. *J. Travel Res.* **2018**, *57*, 31–51. [CrossRef]
4. Lam, S.Y.; Shankar, V.; Erramilli, M.K.; Murthy, B. Customer value, satisfaction, loyalty, and switching costs: An illustration from a business-to-business service context. *J. Acad. Mark. Sci.* **2004**, *32*, 293–311. [CrossRef]
5. Leek, S.; Christodoulides, G. A framework of brand value in B2B markets: The contributing role of functional and emotional components. *Ind. Mark. Manag.* **2012**, *41*, 106–114. [CrossRef]
6. Boyd, D.; Kannan, P.K.; Slotegraaf, R.J. Branded apps and their impact on firm value: A design perspective. *J. Mark. Res.* **2019**, *56*, 76–88. [CrossRef]
7. Thompson, C.J.; Rindfleisch, A.; Arsel, Z. Emotional branding and the strategic value of the doppelgänger brand image. *J. Mark.* **2006**, *70*, 50–64. [CrossRef]
8. Chen, C.F.; Myagmarsuren, O. Brand equity, relationship quality, relationship value, and customer loyalty: Evidence from the telecommunications services. *Total Qual. Manag. Bus. Excell.* **2011**, *22*, 957–974. [CrossRef]
9. Delgado-Ballester, E.; Sabiote, E.F. Brand experimental value versus brand functional value: Which matters more for the brand? *Eur. J. Mark.* **2015**, *49*, 1857–1879. [CrossRef]
10. Keller, K.L. Conceptualizing, measuring, and managing customer-based brand equity. *J. Mark.* **1993**, *57*, 1–22. [CrossRef]
11. Kuhn, K.A.L.; Alpert, F.; Pope, N.K.L. An application of Keller's brand equity model in a B2B context. *Int. J. Qual. Mark. Res.* **2008**, *11*, 40–58. [CrossRef]
12. Holt, D.B.; Quelch, J.A.; Taylor, E.L. How global brands compete. *Harv. Bus. Rev.* **2004**, *82*, 68–75.
13. Keller, K.L. Building customer-based brand equity. *Mark. Manag.* **2001**, *10*, 14–19.
14. Gupta, S.; Lehmann, D.R.; Stuart, J.A. Valuing customers. *J. Mark. Res.* **2004**, *41*, 7–18. [CrossRef]
15. Stokburger-Sauer, N.; Ratneshwar, S.; Sen, S. Drivers of consumer–brand identification. *Int. J. Res. Mark.* **2012**, *29*, 406–418. [CrossRef]
16. Chen, L.; Chen, W. Intelligent city-Tianjin: The system analysis of intelligent community public service. In Proceedings of the IEEE 18th International Conference on Industrial Engineering and Engineering Management, Changchun, China, 3–5 September 2011; pp. 1378–1382.
17. Huang, M.H.; Dev, C.S. Growing the service brand. *Int. J. Res. Mark.* **2020**, *37*, 281–300. [CrossRef]
18. Prahalad, C.K.; Ramaswamy, V. Co-creation experiences: The next practice in value creation. *J. Interact. Mark.* **2004**, *18*, 5–14. [CrossRef]
19. Ballantyne, D.; Varey, R.J. Creating value-in-use through marketing interaction: The exchange logic of relating, communicating and knowing. *Mark. Theory* **2006**, *6*, 335–348. [CrossRef]
20. Carlson, J.; Wyllie, J.; Rahman, M.M.; Voola, R. Enhancing brand relationship performance through customer participation and value creation in social media brand communities. *J. Retail. Consum. Serv.* **2019**, *50*, 333–341. [CrossRef]
21. Breidbach, C.; Brodie, R.; Hollebeek, L. Beyond virtuality: From engagement platforms to engagement ecosystems. *J. Serv. Theory Pract.* **2014**, *24*, 592–611. [CrossRef]
22. Ramaswamy, V.; Ozcan, K. Brand value co-creation in a digitalized world: An integrative framework and research implications. *Int. J. Res. Mark.* **2016**, *33*, 93–106. [CrossRef]
23. De Vries, N.J.; Carlson, J. Examining the drivers and brand performance implications of customer engagement with brands in the social media environment. *J. Brand Manag.* **2014**, *21*, 495–515. [CrossRef]
24. Luo, N.; Zhang, M.; Liu, W. The effects of value co-creation practices on building harmonious brand community and achieving brand loyalty on social media in China. *Comput. Hum. Behav.* **2015**, *48*, 492–499. [CrossRef]
25. Colicev, A.; O'Connor, P.; Vinzi, V.E. Is investing in social media really worth it? How brand actions and user actions influence brand value. *Serv. Sci.* **2016**, *8*, 152–168. [CrossRef]
26. Court, D.; Elzinga, D.; Finneman, B.; Perrey, J. The New Battleground for Marketing-Led Growth. *McKinsey Q.* **2017**, *43*, 64–74.
27. Kim, S.J.; Wang, R.J.H.; Malthouse, E.C. The effects of adopting and using a brand's mobile application on customers' subsequent purchase behavior. *J. Interact. Mark.* **2015**, *31*, 28–41. [CrossRef]
28. Zhao, Y.; Chen, Y.; Zhou, R.; Ci, Y. Factors influencing customers' willingness to participate in virtual brand community's value co-creation. *Online Inform. Rev.* **2019**, *43*, 440–461. [CrossRef]
29. Krebs, I.; Lischka, J.A. Is audience engagement worth the buzz? The value of audience engagement, comment reading, and content for online news brands. *Journalism* **2019**, *20*, 714–732. [CrossRef]
30. Chen, Y.R.R. Perceived values of branded mobile media, consumer engagement, business-consumer relationship quality and purchase intention: A study of WeChat in China. *Public Relat. Rev.* **2017**, *43*, 945–954. [CrossRef]
31. Zhang, J.; Jiang, Y.X. Research on the influence mechanism of brand orientation on brand equity of industrial service enterprises. *Manag. Rev.* **2016**, *28*, 184–195. (In Chinese)
32. Broyles, S.A.; Schumann, D.W.; Leingpibul, T. Examining brand equity antecedent/consequence relationships. *J. Mark. Theory Pract.* **2009**, *17*, 145–162. [CrossRef]

33. Jensen, M.B.; Klastrup, K. Towards a B2B customer-based brand equity model. *J. Target. Meas. Anal. Mark.* **2008**, *16*, 122–128. [CrossRef]
34. Johar, J.S.; Sirgy, M.J. Value-expressive versus utilitarian advertising appeals: When and why to use which appeal. *J. Adv.* **1991**, *20*, 23–33. [CrossRef]
35. Sirgy, M.J.; Grewal, D.; Mangleburg, T. Retail environment, self-congruity, and retail patronage: An integrative model and a research agenda. *J. Bus. Res.* **2000**, *49*, 127–138. [CrossRef]
36. Brangule-Vlagsma, K.; Pieters, R.G.M.; Wedel, M. The dynamics of value segments: Modeling framework and empirical illustration. *Int. J. Res. Mark.* **2002**, *19*, 267–285. [CrossRef]
37. Zhang, J.; Bloemer, J.M.M. The impact of value congruence on consumer-service brand relationships. *J. Serv. Res.* **2008**, *11*, 161–178. [CrossRef]
38. Park, C.W.; Jaworski, B.J.; MacInnis, D.J. Strategic brand concept-image management. *J. Mark.* **1986**, *50*, 135–145. [CrossRef]
39. Aaker, D. A Managing Brand Equity. Simon and Schuster. 2009. Available online: https://www.inovaconsulting.com.br/wp-content/uploads/2016/09/managing-brand-equity-by-david-aaker.pdf (accessed on 9 January 2021).
40. Anderson, J.C.; Gerbing, D.W. Structural equation modeling in practice: A review and recommended two-step approach. *Psychol. Bull.* **1988**, *103*, 411. [CrossRef]
41. Liu, C.R.; Liu, H.K.; Lin, W.R. Constructing customer-based museums brand equity model: The mediating role of brand value. *Int. J. Tour. Res.* **2015**, *17*, 229–238. [CrossRef]
42. Kumar, V.; Kaushik, A.K. Building consumer–brand relationships through brand experience and brand identification. *J. Strateg. Mark.* **2020**, *28*, 39–59. [CrossRef]
43. Thorbjørnsen, H.; Supphellen, M. Determinants of core value behavior in service brands. *J. Serv. Mark.* **2011**, *25*, 68–76. [CrossRef]
44. Napoli, J.; Dickinson-Delaporte, S.; Beverland, M.B. The brand authenticity continuum: Strategic approaches for building value. *J. Mark. Manag.* **2016**, *32*, 1201–1229. [CrossRef]
45. De Chernatony, L.; Cottam, S.; Segal-Horn, S. Communicating services brands' values internally and externally. *Serv. Ind. J.* **2006**, *26*, 819–836. [CrossRef]
46. Charbonnier-Voirin, A.; Poujol, J.F.; Vignolles, A. From value congruence to employer brand: Impact on organizational identification and word of mouth. *Can. J. Adm. Sci.* **2017**, *34*, 429–437. [CrossRef]
47. Smith, K.T.; Smith, M.; Wang, K. Does brand management of corporate reputation translate into higher market value? *J. Strateg. Mark.* **2010**, *18*, 201–221. [CrossRef]
48. Trueman, M.; Cornelius, N.; Wallace, J. Building brand value online: Exploring relationships between company and city brands. *Eur. J. Mark.* **2012**, *46*, 1013–1031. [CrossRef]
49. Wei, H.Y.; Zhang, L.L.Y.; Liang, Y.M.; Yao, Z.W. The influence of multidimensional interaction on service brand equity: A study based on grey relational analysis. *J. Manag. Sci.* **2011**, *10*, 47–57. (In Chinese)