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The Formation Mechanism of Customer Citizenship Behaviors in Open Innovation Community Based on SOR Model

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ABSTRACT

Consumer citizenship behaviors such as recommendation, help, and feedback play an important role in the operation and development of open innovation communities. Clarifying the formation mechanism of consumer citizenship behaviors will not only help firms to accurately develop technological innovation strategies but also encourage value co-creation between the firm and consumers. we employ the SOR model and a questionnaire survey of 318 consumers to empirically examine the relationship between the information quality, system function, social capital, and consumer citizenship behaviors of the open innovation community under different environmental stimuli. Structural equation models are used to empirically test the direct and indirect effects on consumer citizenship behaviors. The results show that environmental factors in open innovation communities influence customer behavior from two dimensions: explicit stimulus and implicit stimulus. We also find that the explicit stimulus of open innovation community is helpful to improve customers' self-identity and then stimulates the emergence of their citizenship behaviors. The implicit stimulus of the open innovation community promotes the formation of customers' subjective norms and further improves the generation of citizenship behaviors.

Keywords: customer citizenship behaviors, open innovation community, SOR model.

INTRODUCTION

In the era of digital economy, open innovation has increasingly become an important means for enterprises to shape their competitive advantages. Driven by the new generation of information technologies such as the Internet of Things, big data and cloud computing, more and more enterprises have begun to form open innovation communities to obtain customer ideas, needs and experience, and then in the fuzzy front-end, technological innovation and achievement transformation, etc. Implement value co-creation in all aspects of the value chain (Chesbrough, 2017). Existing studies have found that customer citizenship behaviors play an important role in the operation and development of open innovation communities, not only attracting customers to participate in enterprise value creation, but also promoting the dissemination and diffusion of customer groups' value propositions, professional insights and technical solutions (Chiu, Huang, Cheng, & Hsu, 2019; Zhu, Sun, & Chang, 2016). In this context, how to stimulate the customer citizenship behaviors of the open innovation community has become an important issue for enterprise innovation management.

Customer citizenship behaviors is a voluntary and spontaneous behavior that is conducive to the development of enterprises, mainly manifested by recommendation, help and feedback (Groth, 2005). Customer citizenship behaviors is the fundamental guarantee for enhancing the vitality of open innovation communities, and exploring the formation mechanism of customer citizenship behaviors has significant theoretical and practical significance for improving the operational efficiency of open innovation communities.

In recent years, customer citizenship behavior has attracted continuous attention from the academic community, and related research mainly includes two branches. On the one hand, scholars discussed the connotation and extension of customer citizenship

behaviors in the binary relationship of "enterprise-customer" based on the service-dominant logic, and found that factors such as corporate reputation, brand experience, and sense of fairness have positive effects on customer citizenship behaviors. On the other hand, some scholars take virtual communities as their research objects, and examine the impact of multiple "community-customer" relationships, such as social capital, customers' sense of belonging and happiness, on customer citizenship behaviors (Chiu, Huang, Cheng, & Sun, 2015).

To sum up, although existing research generally believes that customer citizenship behaviors is of great significance to the management and development of virtual communities, the understanding of its formation mechanism is still very vague. Some scholars have discussed the role of virtual community characteristics, customer experience or feelings on customer citizenship behaviors (Gong & Wang, 2023), but there is a lack of in-depth analysis of how external environmental factors that affect individual behavior affect the generation of customer citizenship behaviors. The research results for the object are also very scarce. In view of this, based on the theory of self-identity and social exchange, this paper takes the value co-creation of enterprises and customers as the main line of logic, and through the SOR model and empirical analysis, examines the role of factors such as social capital and platform functions in open innovation communities on customer citizenship behaviors. Mechanism to provide theoretical support for revealing the formation mechanism of customer citizenship behaviors.

THE RESEARCH HYPOTHESIS

The Conceptual Model

In the 1970s, scholars such as Mehrabian proposed the SOR model to explain the basic principles of generating consumer buying behavior (Mehrabian & Russell, 1974). They believe that some features of the external environment can affect individual cognitive and emotional states, which in turn drive certain behavioral responses of consumers. The SOR model consists of three interrelated elements, namely stimulus, organism, and response.

In order to analyze the formation mechanism of customer citizenship behaviors in the open innovation community, this paper designs a conceptual model as shown in Figure 1 according to the research paradigm of the SOR model. We believe that customer citizenship behaviors belongs to approach behavior, which is a positive response of customers to actively provide help and support to others; customers receive two different types of stimuli, explicit and implicit, in the open innovation community. Cognitive activities for performance and emotional activities for social norms affect the generation of citizenship behaviors such as help, recommendation and feedback. In order to further demonstrate the above relationship, this paper will discuss the relevant research hypotheses of the conceptual model in Figure 1 in the next section, and then make a theoretical foundation for empirical analysis.

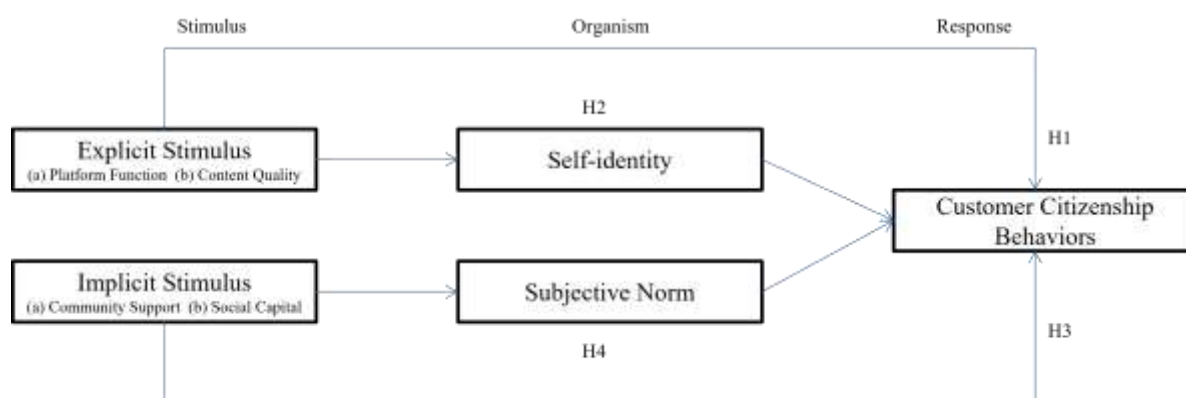


Figure 1: Conceptual model

Explicit Stimuli and Customer Citizenship Behaviors

The appearance of an open innovation community is an Internet platform established by enterprises with the help of a new generation of information technology (Chesbrough, 2017). In an open innovation community, the stimuli that can be perceived by customers originate from external environments such as platform functions and community support. In this paper, referring to previous studies such as Ul Islam and Rahman (2017), Mollen and Wilson (2010), the characteristics of open innovation

communities (platform function, content quality, community support and social capital, etc.) According to the concealment of information processing, the external environmental stimuli that can be perceived by customers are divided into two types: explicit stimuli and implicit stimuli. Specifically, explicit stimulus is the "tangible" environmental factors such as platform functions and content quality of an open innovation community that have a direct or explicit impact on customers, and implicit stimulus is an indirect stimulus to customers. "Intangible" environmental factors such as social capital and sense of community support in an open innovation community that may have an implicit influence.

The SOR model points out that when people are highly related to the external environment, individual behavior is more likely to be stimulated by the direct value and rare features of the external environment (Mehrabian & Russell, 1974; Ul Islam & Rahman, 2017). Especially for those community "opinion leaders" and active customers, they will pay more attention to the personal experience and utility of participating in community activities, and their citizenship behaviors will continue with the continuous improvement of the platform function and content quality of the open innovation community emerge. The higher the content quality of the open innovation community, the easier it is for customers to obtain novel and useful information and knowledge, and the better customer experience and satisfaction drive customers to actively integrate into the value creation process of the enterprise, and ultimately stimulate the emergence of customer citizenship behaviors. Based on the above analysis, this paper proposes the following research hypotheses:

H1a: The content quality of open innovation communities is positively correlated with customer citizenship behaviors.

H1b: The platform function of an open innovation community is positively related to customer citizenship behaviors.

Although the SOR model points out the mediating mechanism between the body (individual cognition or emotion) between external environmental stimuli and individual responses, few studies discuss the specific effects of different types of external environmental stimuli on customer behavior. In view of this, based on the theory of self-identity, this paper further analyzes the mediating mechanism of individual cognition in the open innovation community between explicit stimuli and customer citizenship behaviors. We believe that, compared with individual emotions, explicit stimuli such as platform functions and content quality in open innovation communities will have a more significant impact on individual cognition.

Self-identity theory points out that cognition is the precondition of behavior, and it is the self-evaluation formed by the individual in response to the external environment, that is, a subjective interpretation of the answer to the "true self". Therefore, the stronger the self-identity, the more likely people are to perform the behavior of the corresponding social role. The customers of the open innovation community have dual roles. They are not only the customers of the company's products and services in real life, but also the innovators who contribute information and knowledge to the company in the virtual space. Based on the above analysis, this paper proposes the following research hypotheses:

H2a: Customer self-identity has a mediating effect between content quality and customer citizenship behaviors in open innovation communities.

H2b: Customer self-identity has a mediating effect between the platform function of open innovation community and customer citizenship behaviors.

Implicit stimuli and customer citizenship behaviors

Different from the explicit stimuli of open innovation communities such as platform functions and content quality, the characteristics of open innovation communities such as community support and social capital stimulate customer behavior in a more subtle way. According to the theoretical framework of the SOR model, when individuals lack sufficient motivation and ability to process external information, people will reduce the investigation of the direct value and dominant characteristics of external information, and instead focus on the indirect impact of information. Previous studies have pointed out that the social capital and sense of community support of open innovation communities are important factors that characterize their indirect effects.

Community support is the overall opinion and evaluation of customers on the virtual community in terms of attaching importance to customer contributions and caring about customer welfare. According to the social exchange theory, the interaction between customers and open innovation communities is not only an economic behavior, but also an emotional exchange for spiritual benefits; a high sense of community support will establish a good industry image for enterprises, attracting more customers pay attention to the products and services of enterprises, and motivate customers to take actions that are beneficial to community development (Tinc, Goodspeed, & Sorensen, 2021).

Social capital is the sum of available resources embedded in interpersonal relationships and social networks. Individuals or organizations with rich social capital are more likely to win the trust of others, establish extensive cooperative relations with the outside world by virtue of their good reputation, and then make full use of the scale effect of resource integration. The social capital of the open innovation community is based on the social connection, mutual trust and collective action among customers, through the interaction and cooperation between enterprises and customers and customer groups to achieve a win-win situation (Yao, Tsai, & Fang, 2015). Existing studies have shown that social capital in virtual communities has a positive impact on customers' knowledge sharing, loyalty and citizenship behavior. In summary, this paper proposes the following research hypotheses:

H3a: The social capital of an open innovation community is positively related to customer citizenship behaviors.

H3b: The sense of community support in an open innovation community is positively related to customer citizenship behaviors.

On the basis of the above analysis, this paper further discusses the potential mediating mechanism between the implicit stimuli of open innovation communities and customer citizenship behavior according to the social influence theory. We believe that, relative to individual cognition, implicit stimuli such as social capital and community support in open innovation communities have an important impact on individual emotions. Social influence theory points out that subjective norm is a proxy variable that characterizes individual emotions; when the relationship between an individual and the external environment is weak, people are more likely to be influenced by others and produce behavioral changes in a lower way of information processing. At this time, subjective norm affects customer behavior. formation is decisive.

Subjective norm is the emotion that individuals have when deciding whether to perform a certain behavior in order to gain the approval of others (Ajzen, 1991). Social influence theory points out that people's behaviors are often under invisible pressure, and the concepts, standards and conventions of major social groups (such as family members, colleagues, friends, etc.) will affect the formation of individual attitudes, which will lead to the convergence of people's behaviors (Kelman, 1958; Li, 2013). Therefore, subjective norm has a positive correlation with individual approach behavior. For an open innovation community, a high level of subjective norms not only motivates customers to interact with enterprises and other community members, but also constrains customer behavior, urging them to participate in community activities according to the community members' recognized decision-making preferences and communication patterns (Lin & Huang, 2013). Existing literature shows that subjective norms play an important role in the operation of virtual communities. Li et al. (2019) believed that the subjective norm of the virtual community is an exogenous incentive factor, which is related to the customer's "altruism" Knowledge creation behavior is positively correlated. Therefore, this paper proposes the following research hypotheses:

H4a: Customer subjective norm has a mediating effect between the social capital of open innovation community and customer citizenship behaviors.

H4b: Customer subjective norms have a mediating effect between community support and customer citizenship behaviors in open innovation communities.

RESEARCH METHOD

Samples and Data Sources

This paper collects research data through questionnaires. Before the formal investigation, we compiled a questionnaire based on the mature scales of the existing literature, and invited 5 senior executives of the enterprise and active customers of the open innovation community to propose amendments to the content, structure and writing logic of the questionnaire. The final draft of the questionnaire is formed on the basis of the small sample test.

The formal investigation of this study lasted 4 months from March 2021 to June 2021. From March to May 2021, in order to improve the efficiency of the investigation, with the help of senior management and active customers of the enterprise, through online discussion areas, WeChat Moments, and emails, we will conduct an open-ended survey for Huawei, Haier and Xiaomi Customers of the innovation community distributed 600 electronic questionnaires. The above three companies are industry leaders who attach importance to technological innovation and have many years of experience in operating open innovation communities. The size of the community and the number of active customers is higher than those of similar domestic companies, which are suitable for empirical research in this paper. In June 2021, we further screened the 380 questionnaires collected, excluding the non-response to key items, regular answers, and short filling time, and finally got 318 valid questionnaires, with an effective recovery rate of 53%. In addition, to assess possible nonresponse bias, we compared the questionnaires returned in the early and late periods and found no significant difference in customer characteristics. Therefore, the problem of non-response bias in this study is not serious.

Variable measurement

All variables in this study were measured using a 5-level Likert scale (1 means "completely disagree", 5 means "completely agree") to reflect the respondents' recognition of the measurement items.

1) Dependent variable: Using the scale of Zhu et al. (2016), customer citizenship behavior is measured with 10 items from the three dimensions of recommendation, help and feedback behavior.

2) Independent variable: The platform function is measured according to the scale of Jang et al. (2008), using 3 items such as information exchange and interaction efficiency; the content quality is measured according to the scale of Jang et al. (2008), which is measured from 4 items such as content novelty and reliability; Social capital is measured from the scale of Yao et al. (2015), from 4 items such as social connection and interpersonal relationship; the sense of community support is measured from the scale of Ye et al. (2015), from 3 items of values, opinions and concerns.

3) Mediating variables: According to the research of Xiong et al. (2018), self-identity is measured using three items; the subjective norm draws on the research of Li et al. (2019), using 3 items such as "most people who influence me are using this community" and "I think other customers need me to join". The scale structure is shown in Table 1.

Table 1: Scale structure

Variables and Items	Factor Loadings
Platform Function (PF): Cronbach's $\alpha=0.830$, CR=0.831, AVE=0.621	
PF1. Customers can conduct convenient information exchange and interpersonal communication in the community	0.798
PF2. Customers can quickly ask and answer questions in the community	0.787
PF3. Customers in the community interact frequently with enterprises	0.779
Content Quality (CQ): Cronbach's $\alpha=0.873$, CR=0.873, AVE=0.633	
CQ1. The content of the community is detailed and authoritative	0.759
CQ2. The content of this community is comprehensive and fresh	0.817
CQ3. The information in this community is accurate and reliable	0.771
CQ4. This community has a wealth of sources of information	0.834
Community Support (CS): Cronbach's $\alpha=0.843$, CR=0.843, AVE=0.642	
CS1. My goals and values align with this community	0.797
CS2. The community is willing to assist me when necessary	0.794
CS3. This community cares about my opinion	0.812

Social Capital (SC): Cronbach's $\alpha=0.833$, CR=0.834, AVE=0.556	
SC1. Maintain close contact with community members	0.751
SC2. Commitment among community members	0.724
SC3. Community members will not take advantage of possible opportunities to steal the interests of others	0.772
SC4. Community members have a unified vision and communication style	0.735
Self-Identity (SI): Cronbach's $\alpha=0.831$, CR=0.831, AVE=0.622	
SI1. I think it is necessary to create value for the community	0.767
SI2. I think there should be a contribution to the community	0.809
SI3. I consider myself someone of value to the community	0.789
Subjective Norm (SN): Cronbach's $\alpha=0.825$, CR=0.826, AVE=0.612	
SN1. Most of the people who influence me are using the community	0.780
SN2. More customers motivate me to use the community	0.788
SN3. I think other customers need me to join	0.779
Customer Citizenship Behaviors (CB): Cronbach's $\alpha=0.887$, CR=0.804, AVE=0.579	
Recommended Behavior (RB): Cronbach's $\alpha=0.857$, CR=0.858, AVE=0.669	
RB1. I would proactively recommend this community to those around me	0.814
RB2. I rate this community positively from others	0.828
RB3. I recommend this community to anyone interested in enterprise products	0.811
Helping Behavior (HB): Cronbach's $\alpha=0.861$, CR=0.861, AVE=0.674	
HE1. I am willing to help other customers of the community with problems	0.842
HE2. I take the initiative to teach others how to properly use platform features	0.817
HE3. I often help other customers of the community	0.804
Feedback Behavior (FB): Cronbach's $\alpha=0.860$, CR=0.860, AVE=0.606	
FB1. I actively participate in community customer satisfaction surveys	0.778
FB2. I am able to provide useful feedback on improving platform functionality	0.776
FB3. I provide valid information in a community survey	0.782
FB4. I often make suggestions for improving the quality of content in the community	0.777

Table 2: Correlation coefficient matrix

Variable	Mean	SD	1	2	3	4	5	6	7
1. PF	3.144	0.756	0.788						
2. CQ	3.231	0.892	0.222**	0.796					
3. CS	3.247	0.765	0.405**	0.285**	0.801				
4. SC	3.176	0.729	0.484**	0.229**	0.526**	0.746			
5. SI	3.354	0.797	0.300**	0.245**	0.415**	0.327**	0.789		
6. SN	3.328	0.726	0.400**	0.256**	0.367**	0.389**	0.316**	0.782	
7. CB	3.379	0.595	0.490**	0.410**	0.546**	0.528**	0.514**	0.455**	0.761

Note: **p < 0.01; The diagonal is the square root of AVE.

EMPIRICAL ANALYSIS

Measurement Model

This paper uses structural equations (SEM) to carry out empirical analysis. As shown in Table 1, the Cronbach's alpha coefficient and combined reliability (CR) of all variables are greater than the critical value of 0.7, indicating that the reliability of the scale is good; The standardized factor loading of each item is greater than 0.7, and the average variance extraction (AVE) is greater than 0.5, indicating that the scale has high convergent validity. It can be seen from Table 2 that the square root of the AVE value of all variables on the diagonal is greater than the correlation coefficient of its corresponding row and column, which shows that the discriminant validity between variables is good. In addition, Harman's one-factor test of all variables showed that the cumulative variance contribution of the first common factor was 33.5%, which was below the 40% critical value. Therefore, the problem of common method variance in this study is not serious.

Structural Model

In this paper, Amos 23.0 software is used to test the path coefficient and research hypothesis of the structural model. The main indicators ($\chi^2=499.483$, $\chi^2/df=1.294$, RMSEA=0.030, TLI=0.974, CFI=0.977, NFI=0.905, IFI=0.977) all satisfy Corresponding criteria indicate that the structural model has a good fit. The hypothesis test results are shown in Table 3 and Table 4.

Table 3: Direct effect analysis

Variable Relationship	Regression	S.E.	C.R.	p
CQ→CB	0.133	0.036	3.720	<0.001
PF→CB	0.129	0.053	2.451	0.014
SC→CB	0.132	0.058	2.271	0.023
CS→CB	0.150	0.053	2.834	0.005
PF→SI	0.350	0.072	4.840	<0.001
CQ→SI	0.201	0.061	3.304	<0.001
CS→SN	0.223	0.081	2.742	0.006
SC→SN	0.323	0.085	3.794	<0.001
SI→CB	0.210	0.045	4.720	<0.001
SN→CB	0.111	0.047	2.360	0.018

Table 3 shows that the content quality ($b=0.133$, $p<0.001$) and platform function ($b=0.129$, $p<0.01$) of the open innovation community are significantly positively correlated with customer citizenship behavior. Therefore, it is assumed that H1a and H1b are supported. The regression coefficients of social capital, community support and customer citizenship behavior of open innovation communities are 0.132 ($p<0.05$) and 0.150 ($p<0.01$), respectively. Therefore, it is assumed that H3a and H3b are supported.

Table 4: Bootstrap-based mediation effect analysis

Path Relationship	Effect	Regression	95% Confidence	Mediation Effect
PF→SI→CB	Total Effect	0.456	[0.353, 0.582]	29%
	Indirect Effect	0.130	[0.079, 0.201]	
	Direct Effect	0.326	[0.233, 0.440]	
CQ→SI→CB	Total Effect	0.314	[0.229, 0.415]	32%
	Indirect Effect	0.100	[0.053, 0.180]	
	Direct Effect	0.214	[0.135, 0.300]	
CS→SN→CB	Total Effect	0.468	[0.357, 0.587]	22%
	Indirect Effect	0.104	[0.061, 0.167]	
	Direct Effect	0.364	[0.250, 0.486]	
SC→SN→CB	Total Effect	0.460	[0.347, 0.582]	25%
	Indirect Effect	0.115	[0.062, 0.188]	
	Direct Effect	0.345	[0.218, 0.489]	

Furthermore, this paper adopts the Bootstrap method with bias-corrected percentile to test the mediating effect of the structural model. As shown in Table 4, under the condition of 2000 repeated sampling and 95% confidence interval, the confidence interval of the indirect effect of customer self-identification between the function of open innovation platform and customer citizenship behavior is [0.079, 0.201], and the confidence interval of customer self-identification is [0.079, 0.201]. The confidence interval of the indirect effect between community content quality and customer citizenship behavior is [0.053, 0.180], indicating that customer self-identity has a significant partial mediation effect between explicit stimuli and customer citizenship behavior in open innovation communities. Therefore, it is assumed that H2a and H2b are supported. In the same way, the confidence interval of the indirect effect of customer subjective norms on the support of the open innovation community and the customer's citizenship behavior is [0.061, 0.167], and the confidence interval of the indirect effect between the social capital of the open community and the customer's citizenship behavior is [0.061, 0.167]. 0.062, 0.188], indicating that customer subjective norm has a significant partial mediation effect between implicit stimuli and customer citizenship behavior in open innovation communities. Therefore, it is assumed that H4a and H4b are supported.

CONCLUSION AND IMPLICATIONS

From the perspective of "community-customers" value co-creation, this paper uses the SOR model to explore the mediating mechanism of the external environmental stimuli such as content quality and social capital in open innovation communities affecting customers' citizenship behaviors. The formation mechanism of citizenship behavior. The research found that: Customer citizenship behavior originates from the individual's psychological and cognitive activities, and is the product of the customer's attitude and behavior changes caused by processing external information. Customer self-identity plays a partial mediating effect between explicit stimuli and citizenship behavior in open innovation communities. Subjective norms play a partial mediating effect between implicit stimuli and customer citizenship behavior in open innovation communities.

The theoretical contributions of this study are: On the one hand, based on the SOR model, self-identity and social exchange theory, the environmental factors, individual cognition and emotion, and customer citizenship behavior of open innovation communities are discussed from the perspectives of explicit and implicit stimuli. The interaction relationship and its intermediary mechanism of the SOR model further expand the application scenarios of the SOR model and improve its theoretical explanatory power in the field of customer behavior in virtual communities. On the other hand, from the perspective of "community-customer" value co-creation, this paper examines the formation mechanism of customer citizenship behavior in open innovation communities, which not only enriches the empirical research results of customer behavior literature, but also promotes value co-creation from the context of open innovation communities. The construction of the theoretical system of creation.

The management implications of this paper include the following three points. First, enterprises should actively promote the deep coupling of innovation chain and value chain. This paper finds that the content quality and platform functions of open innovation communities are positively related to customer citizenship behavior. Therefore, enterprises can use the open innovation community as an important carrier to form an innovation chain, and integrate various innovation entities to participate in the technological innovation process of the enterprise. Second, enterprises must carefully design the incentive mechanism for open innovation communities. The stronger the community support felt by customers, the more common their subjective norms and citizenship behaviors in the open innovation community. As an important means to improve the sense of community support, the reward mechanism plays an active role in the operation of the open innovation community. Third, enterprises should give full play to the leading role of "opinion leaders". "Opinion leaders" are not only active customers of the open innovation community, but also a key force connecting community members' interpersonal relationships and social networks. Their behaviors determine to a large extent the information dissemination, public opinion orientation and operational efficiency of the entire community.

The research data in this paper comes from questionnaires. The main conclusions may be affected by the subjective preferences of the respondents and individual characteristics, and there may be measurement biases. Subsequent research can integrate the survey data and business operation data to improve the robustness of the research conclusions. In addition, this paper does not consider the role of moderator variables on customer citizenship behavior, and analyzing the moderating effects of factors such as reward mechanism and community culture can be an important direction for future research.

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REFERENCES

- Ajzen, I. (1991). "The theory of planned behavior." *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Chesbrough, H. (2017). "The future of open innovation." *Research-Technology Management*, 60(1), 35-38. <https://doi.org/10.1111/j.1467-9310.2010.00605.x>
- Chiu, C. M., Huang, H. Y., Cheng, H. L., & Hsu, J. S. (2019). "Driving individuals' citizenship behaviors in virtual communities through attachment." *Internet Research*, 29(4), 870-899. <https://doi.org/10.1108/INTR-07-2017-0284>

- Chiu, C. M., Huang, H. Y., Cheng, H. L., & Sun, P. C. (2015). "Understanding online community citizenship behaviors through social support and social identity." *International Journal of Information Management*, 35(4), 504-519. <https://doi.org/10.1016/j.ijinfomgt.2015.04.009>
- Gong, T., & Wang, C. Y. (2023). "Unpacking the relationship between customer citizenship behavior and dysfunctional customer behavior: The role of customer moral credits and entitlement." *Journal of Service Theory and Practice*, 33(1), 110-137. <https://doi.org/10.1108/JSTP-12-2021-0256>
- Groth, M. (2005). "Customers as good soldiers: Examining citizenship behaviors in internet service deliveries." *Journal of Management*, 31(1), 7-27. <https://doi.org/10.1177/0149206304271375>
- Islam, J. U., & Rahman, Z. (2017). "The impact of online brand community characteristics on customer engagement: An application of Stimulus-Organism-Response paradigm." *Telematics and Informatics*, 34(4), 96-109. <https://doi.org/10.1016/j.tele.2017.01.004>
- Jang, H., Olfman, L., Ko, I., Koh, J., & Kim, K. (2008). "The influence of on-line brand community characteristics on community commitment and brand loyalty." *International Journal of Electronic Commerce*, 12(3), 57-80. <https://doi.org/10.2753/JEC1086-4415120304>
- Kelman, H. C. (1958). "Compliance, identification, and internalization: Three processes of attitude change." *Journal of Conflict Resolution*, 2(1), 51-60. <https://doi.org/10.1177/002200275800200106>
- Li, C. Y. (2013). "Persuasive messages on information system acceptance: A theoretical extension of elaboration likelihood model and social influence theory." *Computers in Human Behavior*, 29(1), 264-275. <https://doi.org/10.1016/j.chb.2012.09.003>
- Li, H., Peng, L. H., & Hong, C. (2019). "Research on incentive factors of knowledge innovation behavior of virtual community customers from the perspective of internal and external students." *Library and Information Service*, 63(8), 45-56. <https://doi.org/10.13266/j.issn.0252-3116.2019.08.007> (in Chinese).
- Lin, F. R., & Huang, H. Y. (2013). "Why people share knowledge in virtual communities?" *Internet Research*, 23(2), 133-159. <https://doi.org/10.1108/10662241311313295>
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. Cambridge: The MIT Press.
- Mollen, A., & Wilson, H. (2010). "Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives." *Journal of Business Research*, 63(9-10), 919-925. <https://doi.org/10.1016/j.jbusres.2009.05.014>
- Tinc, P. J., Goodspeed, M. M., & Sorensen, J. A. (2021). "Understanding trends in PTO shielding using Kelman's processes of change." *Journal of Agromedicine*, 26(2), 193-198. <https://doi.org/10.1080/1059924X.2020.1795030>
- Ul Islam, J., & Rahman, Z. (2017). "The impact of online brand community characteristics on customer engagement: An application of Stimulus-Organism-Response paradigm." *Telematics and Informatics*, 34(4), 96-109. <https://doi.org/10.1016/j.tele.2017.01.004>
- Xiong, Y., Cheng, Z., Liang, E., & Wu, Y. (2018). "Accumulation mechanism of opinion leaders' social interaction ties in virtual communities: Empirical evidence from China." *Computers in Human Behavior*, 82, 81-93. <https://doi.org/10.1016/j.chb.2018.01.005>
- Yao, C. Y., Tsai, C. C., & Fang, Y. C. (2015). "Understanding social capital, team learning, members'e-loyalty and knowledge sharing in virtual communities." *Total Quality Management & Business Excellence*, 26(5), 619-631. <https://doi.org/10.1080/14783363.2013.865918>
- Ye, H. J., Feng, Y., & Choi, B. C. (2015). "Understanding knowledge contribution in online knowledge communities: A model of community support and forum leader support." *Electronic Commerce Research and Applications*, 14(1), 34-45. <https://doi.org/10.1016/j.eierap.2014.11.002>
- Zhu, D. H., Sun, H., & Chang, Y. P. (2016). "Effect of social support on customer satisfaction and citizenship behavior in online brand communities: The moderating role of support source." *Journal of Retailing and Consumer Services*, 31, 287-293. <https://doi.org/10.1016/j.jretconser.2016.04.013>