Psychology Research and Behavior Management

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Effects of Professional Virtual Community Attributes and Flow Experience on Information Sharing Among Chinese Young Netizens: A Fuzzy-Set QCA

Huawei Zhi, Danping Zhang

School of Economics and Management, Tiangong University, Tianjin, 300387, People's Republic of China

Correspondence: Danping Zhang, School of Economics and Management, Tiangong University, Tianjin, People's Republic of China, Email danping_zhang@163.com

Purpose: As an important channel to search and share information, professional virtual community (PVC) has become one of the main channels for Chinese young netizens to search information and socialize. However, despite many researches on PVC have been conducted in various fields, there is still a lack of researches on young netizens in China, who are in the stage of online social networking booming with countless PVCs but many of them are non-effective. Moreover, there are few studies to explore explicit paths to obtain the effective information sharing or sustainable development of PVC. Therefore, based on this research gap and social cognitive theory, this study explored PVC information sharing among Chinese young netizens combining the external factors and the individual factors, and attempted to obtain the paths to the effective PVC information sharing.

Methods: An online survey was conducted through snowball sampling in China, and 407 samples from 15 different PVCs were confirmed. By using fuzzy-set qualitative comparative analysis (fsQCA) with software fs/QCA 3.0, this study attempted to explore the casual configurations that achieve high and non-high effectiveness of PVC information sharing among Chinese young netizens.

Results: Three types of equivalent configurations that can achieve high effectiveness of PVC information sharing are obtained; Four types of equivalent configurations that can achieve non-high effectiveness of PVC information sharing are obtained. Furthermore, the findings indicate that the expertise of PVC and challenge-skill balance of members are the primary factors in PVC information sharing.

Conclusion: The findings of this study provide that the paths to high and non-high effectiveness of PVC information sharing, which is beneficial to the management and development of PVC. Furthermore, it is helpful for netizens to find and enjoy the PVCs with high quality when they need them. The management of public opinion and how to design web pages to improve the user experience can also be carried out from this perspective.

Keywords: professional virtual community, attributes, flow experience, information sharing, FsQCA

Introduction

A professional virtual community (PVC) is viewed as a virtual community which gathers a scattering group of people together with common expertise about a particular area.[1,2] PVC can be used to help members improve professional ability, gain advanced insights, and solve related problems.[3,4] Due to the advancement of digital technology, social media technologies have changed people's daily life drastically,[5] more and more people are willing to search and share information on virtual platforms.[6–8] So, PVC is becoming one of the most important channels to share opinions and information.[9] Especially in China, various social networking sites and "we media" have developed rapidly in recent years. According to a report published by the China Internet Network Information Center (CINIC) in February 2022, the number of Chinese netizens has reached 1.032 billion, of which young netizens prefer to obtain information through online music, online video, online livestreaming, online education and other emerging ways (CNNIC, 2021).[10] Numerous young netizens have formed various kinds of PVCs, representing a new type of social culture. As one of the main channels for social networking among

Received: 23 August 2022
Accepted: 19 November 2022
Published: 5 December 2022

young netizens in China, the content sharing in PVC has affirmative effects on both education and business.[1] In addition to acquiring knowledge through PVC, people also enjoy the benefits of shopping, transportation, entertainment, etc.[11–14] Hence, studying the information sharing behavior and conditions of generating high-effectiveness information sharing behavior are of great significance in improving the social influence and business value of PVC.[15–17] Moreover, it can also provide valuable guideline for the development of PVC and management of public opinion.

Researches on PVC information sharing were conducted in various fields, for example, psychology, business, education, communication and medicine, etc.,[5,6,18–21] showing that people in different fields are willing to obtain information through PVCs. A successful PVC needs the continuous information and peer's recognition.[22,23] Therefore, it is necessary to study the factors that motivate continuous contribution to maintain and promote the development of PVC.[24] In fact, there have been many studies exploring PVC information sharing from different perspectives. According to the existing research results, factors that have been shown to influence PVC information sharing directly or indirectly include: status-standing,[25] off-line activities, enjoyability,[26,27] commitment,[28] members' social embeddedness,[29] community cohesiveness, community attachment,[30] network externality, social interaction, enjoyment of helping, self-image expression,[31] trust, communication, leadership,[32] social capital,[33] and community climate, etc.[34] However, in light of a comprehensive literature review, we have found that, despite the huge body of studies on PVC information sharing, few have been conducted to explore explicit paths to obtain the effective information sharing or sustainable development of PVC.[35] Moreover, the development PVC begun to flourish in China in recent years,[22,36] but the relevant research on young Chinese netizens is not mature enough.[37–40] According to social cognitive theory, individual behavior is influenced by both environmental factors and personal cognition.[41] Therefore, based on the research gap and social cognitive theory, we attempted to examine the influence of the contextual attributes of PVC and individual flow experience on PVC information sharing among Chinese young netizens. In addition, by using the asymmetric thinking of fsQCA,[42] we attempted to obtain the influence path to high and non-high effectiveness of PVC information sharing.

The rest of the paper is organized as follows. In section 2, we introduce all of the variables involved in this study. Then we highlight the methods of our analysis in section 3, and the results are presented in section 4. We make a brief discussion about the results in section 5. The limitations and prospects of this study are given in section 6. Finally, the conclusion is made in section 7.

Theoretical Background

Social cognitive theory provides a framework for studying human behavior,[41] ie, combining the external factor and the individual factor is requested for studying human behavior. In addition to the traditional psychology, education, and management fields,[43] the theory is also applied in the field of social networking widely.[44] The related studies take the online behavior as behavior factor, such as information sharing behavior and blog stickiness; regard motivation, community loyalty as personal factor; take social influence, strength of social ties, social network, norm of reciprocity and trust, and the system quality of a website as external factor.[3,43–45] Based on these researches and the context of PVC information sharing in China, we select the external factors from the natural attributes of PVC in this work due to facilitate the implementation of management. On the other hand, we choose the flow experience as personal factors, because computer-mediated communication is a typical context where users can experience the psychological state of flow, and social networking sites are excellent platforms to explore users' flow experience.[46] Therefore, it is necessary and reasonable to examine their impact on information sharing behavior in PVC.

Figure 1 shows the research model of this study, presents that the combination of external attributes of PVC and internal flow experience have influence on information sharing behavior. At the same time, by employing fsQCA, it is possible to obtain the paths to the high or non-high effectiveness of information sharing with the configurations of these determinant variables.

Professional Virtual Community and Its Attributes

PVC provides services and supports for individuals with common interests, and the continuous mutual cooperation can satisfy their needs of daily communication and learning with useful information, novel insights and problem solutions in PVC.[47,48] Related researches show that PVC mainly has the following characteristics: the activities should be on Internet,

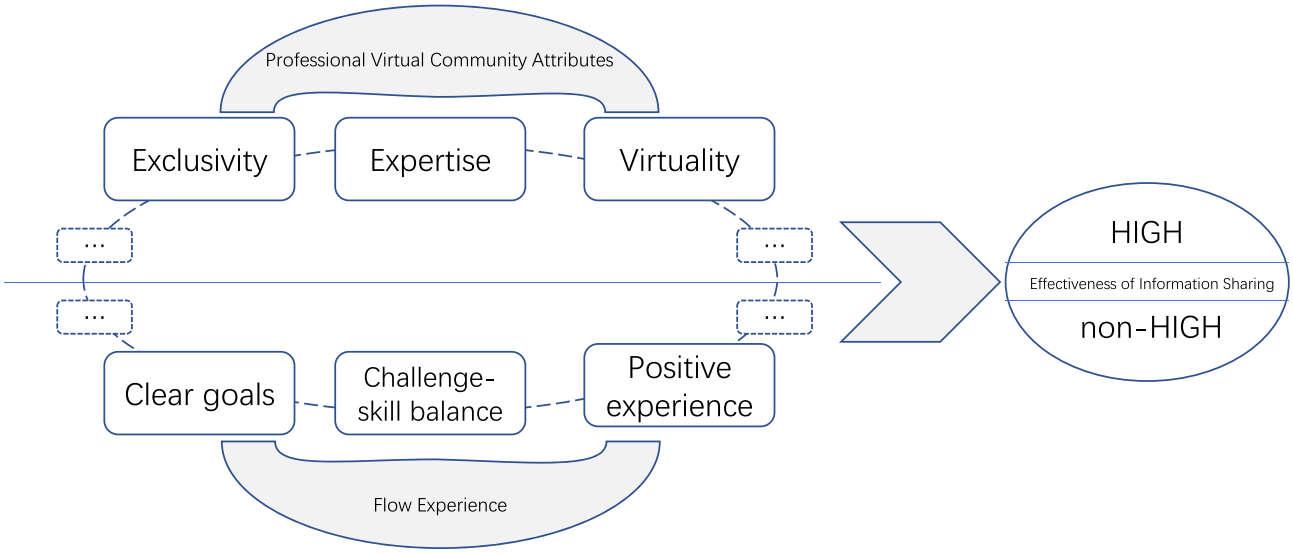

Figure 1 Research model.

the supporting of information technology is necessary, the information shared in PVC is controlled by the members, and continuous communications between members benefit to the prosperity of the PVC.[49] Based on the related researches, this study summarizes the attributes of PVC into the following three aspects: the exclusivity that occurs naturally in the formation process of PVC, the expertise that mainly reflects the existence meaning of PVC, and the virtuality caused by the existence environment of PVC.

Exclusivity is a natural attribute that comes with the formation of a PVC.[50] On the one hand, PVC is exclusive in form, for example, verification or registration is necessary when people try to join them even sometimes the visitor just wants to be a lurker.[51] Various verification standards are set by different PVCs. On the other hand, there are also basic information barriers for those who want to join the PVC.[1] In many cases, PVCs prefer to limit the participation to those who have similar purpose and ability, because the discussions between them have their own styles and there are some specific terminologies used in the communication.[52] The information shared in the PVC may be obscure to people outside of PVC, which reflects the natural exclusivity of PVC. Hence, it is necessary to take into account the exclusivity of PVC when studying information sharing of PVC.

Expertise refers to the reliability and utility of the information shared in PVC. PVC provides the platform for members to create and share their empirical knowledge cooperatively, which contains tremendous amount of hidden empirical knowledge preserved in the discussion process.[53] Members are usually professional in specific field, more precise to say, the people who often share information in PVC have professional knowledge or problem-solving capabilities about a specific area of expertise.[1] In addition, the contents discussed in PVC are professional and useful, and the source of information is accurate, relevant, complete.[54] Thus, both the quantity and quality of content shared in PVC should be taken into consideration in studying information sharing of PVC.

Virtuality could be viewed as the degree to which people in a virtual community know each other in real life.[55] Members in PVC live far or near, some of them even never see or know each other in real life.[47] Previous studies show that the development of PVC is influenced by the degree of virtuality.[56] Generally, the degrees of virtuality are different for various PVCs. And the form of platform also influences the degree of virtuality drastically. Take China's social software, for example, the virtuality of PVCs on WeChat is totally different from the one on Weibo. Correspondingly, the popularity of the information shared through various platforms is also different. Therefore, it is necessary to consider the impact of virtuality on information sharing of PVC.

Flow Experience and Its Antecedents

Flow experience first appeared in 1975, it was used to describe one of the most positive feelings and enjoyable experiences in human lives.[57,58] By definition, flow is the psychological state in which an individual feels cognitively efficient, motivated, and happy.[59] Flow occurs when the action involves clear goals, immediate feedback, concentrate, and a balance between perceptions of one's skills and difficulty of the action.[60] Nowadays, social platforms are characterized by collaboration and community. They can create immersive and controllable experiences and provide users with instant feedback, which makes them a fertile land for generating flow experience.[61,62] The measurements of the dimensionality of flow have been further theorized since Csikszentmihalyi's seminal work.[63] Agarwal and Karahanna use five structures to measure flow: curiosity, control, temporal dissociation, focused immersion, and heightened enjoyment,[64] Koufaris conceptualizes flow as consisting of intrinsic enjoyment, perceived control, and concentration focus,[65] and Pelet et al operationalize flow concept with five dimensions: concentration, enjoyment, control, challenge, and curiosity.[61] The dimensions in this study involve: clear goals, challenge-skill balance, immediate feedback, temporal distortion and enjoyment. This study attempts to divide the antecedents that generate flow into the following three parts, and explore their impacts on the effectiveness of information sharing behavior.

Clear goals determined in advance or obtained during the activity generally give people a strong sense of what he or she is going to do.[66,67] Previous researches[68] argue that clear goals can make people more focused, and it is a necessary antecedent to achieve the flow experience. Clear goals provide people guidelines and drive activity.[69,70] There are various kinds of information in the process of social networking, and people are easy to indulge in it uncontrollably. Clear goals provide them benchmarks for feedback, which is crucial for people to enjoy themselves in the activities.[71] Hence, as a key factor in gathering young netizens, whether the clear goal is an important influencing factor of information sharing in PVC needs to be examined.

Challenge-skill balance presents a state that one feels both optimally challenged and confident that everything is under control.[57] Although flow is defined as a multidimensional construct, the challenge-skill balance is considered by many studies as the primary dimension to measure flow.[71,72] Under the state of flow, the person perceives a balance between the challenges of a situation and one's skills, with both operating at a high level.[66] It is a challenge for some people to understand and filter information or participate in the activities in PVC due to their different status and expertise. Thus, taking challenge-skill balance into studying on information sharing of PVC is interesting and necessary.

Positive experience includes the following indicators in this research: immediate feedback, temporal distortion, enjoyment.[63,73] They are considered as antecedents of flow experience in previous researches on social networks,[74] and they also present the flow state,[62] hence we integrate these factors to the positive experience which is taken as one of the indicators in this study. Previous study shows that playfulness has positive effect on the willingness to continuous sharing.[75] Therefore, it is necessary to examine whether positive experiences of members can have an impact on information sharing when they browse information or participate in activities in PVC.

Information Sharing of Professional Virtual Community

Information can be considered as a primary resource shared among members of PVC.[76] As one of the basic functions of PVC, information sharing involves the exchange of useful information such as ideas, opinions, news and experiences in PVC.[77] Generally, people select and judge information according to their own needs, and then adopt, use and share information based on the perception of information utility.[55] This process of using information purposeful is considered as a social behavior of sharing resources.[76,78] There are many forms of information sharing, such as post, information forwarding, comments, likes, etc. Effective information sharing involves members receiving and believing information shared in the PVC, and then affects people outside the PVC.[31,79,80] The status of information sharing in PVC not only affects users' experience, but also further affects the development of PVC.[1] Thus, it is of great theoretical and practical significance to explore the conditions that can affect the effectiveness of information sharing.

Methods

Measurement of Variables

All the measurement items are from related theories and previous studies, while we make minor modifications that were made to fit the context of PVC in the present study. Then, we translated the original English items into Chinese and back-translation to English rigorously.

Exclusivity was measured using a scale taken from Leimeister et al.[81] It contains 4 items, rated on a 5-point Likert scale from 1 representing "strongly disagree" to 5 representing "strongly agree" (α = 0.819602). Sample items include: "registration or verification is required to join our PVC", "Without registration, people outside the PVC will not be able to view the complete information". Higher scores indicate higher exclusivity.

Expertise was measured using a scale adapted from Chen and Hung.[48] It is composed of 3 items and uses a 5-point Likert scale answer format, with 1 referring to "strongly disagree" and 5 referring to "strongly agree" (α = 0.832588). Sample items include: "The information shared in our PVC is helpful for my real life", "We share common interests and skills in our PVC". Higher scores indicate higher expertise.

Virtuality was measured using a scale taken from Chung et al.[31] This contains 2 items and uses a 5-point Likert scale answer format, with 1 referring to "strongly disagree" and 5 referring to "strongly agree" (α = 0.779617). Sample items include: "I know many people privately in our PVC", "I know many people privately in our PVC". Higher scores indicate lower virtuality.

Clear goals was measured using a scale taken from Chen.[69] It contains 2 items and a 5-point Likert scale format, from 1 representing "strongly disagree" to 5 representing "strongly agree" (α = 0.854499). Sample items include: "I knew clearly what I was supposed to do", "I know I want to do in our PVC". Higher scores indicate higher clarity.

Challenge-Skill balance was measured using a scale adapted from Procci et al.[70] It is composed of 3 items and uses a 5-point Likert scale answer format, with 1 referring to "strongly disagree" and 5 referring to "strongly agree" (α = 0.827851). Sample items include: "When I do what I need in our PVC, I feel just the right amount of challenge", "I feel that what I need to do matches my skills well". Higher scores indicate higher matching degree.

Positive experience was measured using a scale taken from Procci et al.[70] It contains 4 items, rated on a 5-point Likert scale from 1 representing "strongly disagree" to 5 representing "strongly agree" (α = 0.900929). Sample items include: "I feel things interesting in our PVC", "I know how well I am proceeding in PVC". Higher scores indicate higher positive degree.

PVC information sharing was measured using the scale developed by Koh and Kim.[82] It is composed of 4 items and uses a 5-point Likert scale answer format, ranging from 1 representing "strongly disagree" to 5 representing "strongly agree" (α = 0.844145). Sample items are "I often share information in our PVC", "I always talk about the benefits of our PVC with people around me". Higher scores indicate higher effectiveness of PVC information sharing.

Sampling and Data Collection

An online survey is conducted because the target subjects are supposed to be active in the network. The questionnaire contains 7 variables and related 22 items. Information from interviewees was collected by snowballing between August 2021 and October 2021. A total of 471 completed questionnaires were collected. After the questionnaires were retrieved, we screened the validity of the questionnaire according to three criteria: first, whether the answering time reaches the basic test time set based on the average time spent in the pre-survey; second, whether the answer of questionnaire is strictly regular; third, whether the total number of people belonging to the same PVC is not less than 10. According to these three principles, we eliminated 64 invalid questionnaires and got a total of 407 valid questionnaires, with an effective recovery rate of 86.4%. The age selection criteria of this study follow the criteria for young people aged 14 to 35 in the Middle- and Long-term Youth Development Plan (2016–2025) released by the Central Committee and the State Council of China.[83] According to statistics, participants are from 32 provincial-level administrative regions in China. Of the 407 respondents, 50.4% are male and 49.6% are female; 58.2% are between 14 and 25 years old, 41.8% are between 26 and 35 years old; people with high education account for 83.5%; 65.8% of people spend more than 3 hours online every day; 10.3% claim that they prefer to communicate with people offline. Table 1 lists specific information of the respondents.

Table 1 Sample Characteristics (the Number of Subjects = 407)

Demographic Characteristics		Frequency	Percentage
Gender	Male	205	50.4%
	Female	202	49.6%
Age	14–20	59	14.5%
	21–25	178	43.7%
	26–30	144	35.4%
	31–35	26	6.4%
Education	Primary school or below	16	4%
	High school	51	12.5%
	College (3 years)	100	24.6%
	University	202	49.6%
	Graduate school	31	7.6%
	PhD	7	1.7%
Average time of internet use (per day)	<1	17	4.2%
	1–3	122	30%
	3–5	141	34.6%
	>5	127	31.2%
Prefer online or offline communication	Online	162	39.8%
	Offline	42	10.3%
	Both	203	49.9%

FsQCA

To realize the configurational approach, we utilize the fsQCA technique to perform set-theoretic analysis. Grounded in set theory, fsQCA can be seen as a "middle-way study" design between purely deductive variable-oriented design and purely inductive case-based design.[84,85] The advantages of fsQCA in comparison with traditional analysis techniques are two: equifinality, which means that different paths can lead to the same outcome by using Boolean algebra; asymmetry, which means that the presence and the absence of the outcome may require different explanations respectively.[86,87] In addition, the main strength of the QCA is its ability to process small N samples that are too large for traditional qualitative analysis and too small for traditional statistical analysis (eg, between ten and fifty cases).[88]

Since this study is aimed to explore how the attributes of PVC and flow experience affect the effectiveness of information sharing in PVC, plus the limited number of available samples, fsQCA is an ideal methodology for this study. There are many ways to categorize PVCs.[22] In the present study, the selection of PVC was based on the interest classification of Weibo and Bilibili, the currently popular network platforms in China. The selection method was in line with the aesthetics of the public, and the number of followers and development status of selected PVCs were different, which meet the sample selection criteria of QCA. In the questionnaire, the question of which PVC they belong was included and after deleting the PVCs with too few members, finally, fifteen PVCs were used as the cases of this study, as shown in Table 2. Then, the study analyzes the interaction between the set of conditions variables and the outcome variable by using the computer software fs/QCA 3.0.

Variable Calibration

Analyzing data in fsQCA requires translating raw data which contains causal conditions and outcomes into fuzzy set values between 0 and 1.[89,90] Value close to 0 means a "low" level of the variable, and value close to 1 means a "high" level of the variable.[91] As fsQCA allows continuous set membership calibration, the loss of information is minimized.[89] To calibrate the data, researchers need to set three different anchors, including full non-membership point, full

Table 2 The Cases Used in Study

Case	Respondents	Case	Respondents	Case	Respondents
Mother and Baby	17	Popular Science	28	Comics and animation	30
Business	22	Competitive sports	29	Electronic Sports	28
Literature and Art	24	Entertainment	31	Photography	18
Video clip	37	Automotive Technology	28	Fashion and shopping	21
Sports and Fitness	38	Food and cooking	32	Film and Music	24

membership point and a cross-over point.[87] The continuum between these two extremes reflects varying degrees of membership, the crossover point is the point of maximum ambiguity, representing cases that are neither in nor out of the set.[92] In line with previous study,[93,94] the original values of 1, 3, and 5 were set as full non-membership, cross over point and full membership, respectively, in the present study. After defining the set membership anchors, fs/QCA 3.0 is used for the automatic calibration procedure.[87]

Results and Analysis

After the fuzzy-set score was obtained, we conducted both necessity and sufficiency analyses. With this two-step analysis, we can determine whether any one of the variables is necessary and which configurations of variables are sufficient for high or non-high effectiveness of PVC information sharing.

Necessary Conditions Analysis

The first step of the analysis in the fsQCA addresses the analysis of necessary conditions. Conventionally,[92] a condition or a combination of conditions is "necessary" or "almost always necessary" if the consistency score exceeds the threshold of 0.9; hence, we adopt an individual consistency score of 0.90 as the cut-off threshold. As shown in Table 3, none of the individual factors exceeds the threshold of 0.90, which indicates the nonexistence of necessary conditions can achieve either high or non-high effectiveness of information sharing. Table 3 presents the results of necessary analysis of the high effectiveness and non-high effectiveness of information sharing.

Sufficiency Analysis

We conducted a sufficiency analysis following established QCA procedures by using a frequency benchmark ≥1, raw consistency benchmark ≥0.8, and a proportional reduction in inconsistency (PRI) ≥0.70.[95] We report two sets of results: configurations for achieving high effectiveness of PVC information sharing, and configurations for achieving high effectiveness of PVC information sharing, and next, we will analyze these two sets of results in combination with related cases.

Table 3 Analysis of Necessary Conditions

	High Effectiveness		Non-High Effectiveness	
	Consistency	Coverage	Consistency	Coverage
Exclusivity	0.864233	0.805442	0.430675	0.477551
~ Exclusivity	0.439416	0.393464	0.824540	0.878431
Expertise	0.891971	0.806069	0.402454	0.432718
~ Expertise	0.372263	0.343666	0.819632	0.900269
Virtuality	0.878832	0.767857	0.409816	0.426020
~ Virtuality	0.343066	0.328212	0.776687	0.884078
Clear goals	0.716788	0.717836	0.462577	0.551170
~ Clear goals	0.551825	0.463235	0.763190	0.762255
Challenge-skill balance	0.890511	0.801577	0.422086	0.452037
~ Challenge-skill balance	0.391241	0.362652	0.814724	0.898512
Positive experience	0.890511	0.839065	0.407362	0.456671
~ Positive experience	0.423358	0.375162	0.856442	0.902975

Analysis of the Outcome Variable: High Effectiveness

Three types of equivalent configurations that can achieve high effectiveness of PVC information sharing are obtained. We display results for three casual configurations that reach high effectiveness of information sharing with high solution consistency and solution coverage (0.940141, 0.779562, respectively), which means that they are sufficient to produce the outcome. Table 4 shows that satisfied consistency and coverage for each solution.

Configuration 1 shows that high expertise and high challenge-skill balance are the core conditions, non-high virtuality, non-high clarity of goals and high positive experience are the peripheral conditions, which can generate the high effectiveness of information sharing of PVC. In the PVC with high expertise, when members have a good experience in browsing group information or participating in activities, the main determined factor of information sharing behavior is the confidence level of young netizens in recognizing professional information if there is a large intersection between the members in the virtual world and the real world. In this case, members can have considerable information sharing behavior even if they participate aimlessly. When members socialize in the PVC with high expertise, the endorsement of the information quality and word-of-mouth makes members not reject random or unexpected information. At the same time, the immersive mentality they have can help them to treat and accept various kinds of information rationally.

Configuration 2 shows that high expertise and high challenge-skill balance are the core conditions, high exclusivity, non-high virtuality and high positive experience are the peripheral conditions, which can generate the high effectiveness of information sharing of PVC. Compared with configuration 1, the PVC under configuration 2 has a larger degree of exclusivity, and whether members have a clear goal when participating in activities no longer affects their information acceptance and sharing behavior. Under this configuration, the high-expertise ensures that the information shared in PVC can still meet the needs of members, and members also have matched skills to participate in it, plus combining good experience with lower virtuality, which can be seen as a typical online version of the traditional offline groups in reality. In this kind of PVC, its authority can make the information adoption and sharing more efficient among members.

Configuration 3 shows that high expertise and high challenge-skill balance are the core conditions, non-high exclusivity, non-high virtuality, non-high positive experience and high clarity of goals are the peripheral conditions, which can generate the high effectiveness of information sharing of PVC. In the PVC with high-expertise and a large intersection with reality, for the confident "expert" young netizens, even if their experience is not very pleasant in PVC, their adoption and sharing of information will not be affected as long as they have clear goals when participating in

Table 4 Configurations for Achieving High Effectiveness of Information Sharing (fsQCA)

	Configurations (High Effectiveness)		
	1	**2**	**3**
Exclusivity		●	○
Expertise	⬤	⬤	⬤
Virtuality	○	○	○
Clear goals	○		●
Challenge-skill Balance	⬤	⬤	⬤
Positive experience	●	●	○
Consistency	1	0.933071	1
Raw Coverage	0.39562	0.691971	0.214599
Unique Coverage	0.0204379	0.315329	0.0642337
Overall Solution Consistency	0.940141		
Overall Solution Coverage	0.779562		

Note: ⬤ = core causal condition present; ◯ = core causal condition absent; ●= peripheral condition present; ○= peripheral condition absent.

activities or browsing information. The PVC under this configuration is very friendly to new entrants, it can meet the needs of members well with low barriers. Common examples are PVCs for shopping, livestreaming etc.

Analysis of the Outcome Variable: Non-High Effectiveness

Four types of equivalent configurations that can achieve non-high effectiveness of PVC information sharing are obtained. We display results for four casual configurations that reach non-high effectiveness of information sharing with high solution consistency and solution coverage (0.967532, 0.731288, respectively), which means that they are sufficient to produce the outcome. Table 5 shows that satisfied consistency and coverage for each solution.

Configuration 4 shows that non-high expertise and non-high challenge-skill balance are the core conditions, high virtuality, non-high clarity of goals and non-high positive experience are the peripheral conditions, which can generate the non-high effectiveness of information sharing of PVC. In the PVC with high virtuality, if the expertise level of PVC is not high enough, the "non-expert" young netizens who are not confident enough to recognize information are not willing to accept the information shared in PVC easily. Members believe their own feelings more when they participate aimlessly. A not-so-good experience makes them not care about the information in this PVC. It also shows that contemporary Chinese young netizens have the basic ability to filter information in a virtual social environment.

Configuration 5 shows that non-high challenge-skill balance is the core condition, non-high exclusivity, high expertise, non-high virtuality, non-high clarity of goals and non-high positive experience are the peripheral conditions, which can generate the non-high effectiveness of information sharing in PVC. Situation of PVC and psychological state of members are complex under this configuration, which indicates that when the public opinion environment is loose and members are more likely to meet in real life, even if the information shared within the high expertise community, it is still difficult for those young netizens who do not have clear goals to believe and accept the information. In this case, once young netizens are lack of confidence in participating in PVC, the adoption and sharing of information presents inefficient.

Configuration 6 shows that non-high expertise is the core condition, non-high exclusivity, high virtuality, non-high clarity of goals, high challenge-skill balance, and non-high positive experience are the peripheral conditions, which can generate the non-high effectiveness of information sharing of PVC. Similar to configuration 4, the PVC also has non-expertise attribute and members still have few intersections in real life under configuration 6. The difference is that the social environment is relatively loose and the goals of young netizens in PVC are clearer. Meanwhile, members are so

Table 5 Configurations for Achieving Non-High Effectiveness of Information Sharing (fsQCA)

	Configurations (Non-High Effectiveness)			
	4	**5**	**6**	**7**
Exclusivity		○	○	●
Expertise	◯	●	◯	◯
Virtuality	●	○	●	○
Clear goals	○	○	●	●
Challenge-skill Balance	◯	◯	●	◯
Positive experience	○	○	○	○
Consistency	0.95992	1	1	1
Raw Coverage	0.58773	0.164417	0.171779	0.176687
Unique Coverage	0.41227	0.0245398	0.0650307	0.0466258
Overall Solution Consistency	0.967532			
Overall Solution Coverage	0.731288			

Note: ● = core causal condition present; ◯ = core causal condition absent; ● = peripheral condition present; ○ = peripheral condition absent.

confident in obtaining information that they do not fully trust the information shared in this PVC. Coupled with the not-so-good experience, it is difficult for them to adopt and share information under this state.

Configuration 7 shows that non-high expertise and non-high challenge-skill balance are the core conditions, high exclusivity, non-high virtuality, high clarity of goals, and non-high positive experience are the peripheral conditions, which can generate the non-high effectiveness of information sharing of PVC. Configuration 7 shows that for a PVC with strong exclusivity and many members of which intersect in real life, when the quality of the information shared in PVC is not high, it is difficult for members with low responsiveness but strong purpose to get a good experience. In this case, the effectiveness of various types of information sharing is low. This type of PVC is generally more entertaining and relatively small, such as a game group made up of familiar people.

Discussion

This study can help to understand the behaviors and habits of young netizens in PVCs and provide possible solutions for improving effectiveness of information sharing in PVC. Drawing upon social cognitive theory, six conditions are highlighted from the perspective of the PVC's natural attributes and the flow experience. Three paths to high effectiveness of information sharing are obtained by using fsQCA. Four paths to non-high effectiveness of information sharing are obtained through the asymmetric thinking of the fsQCA approach.

Theoretical Implications

This study extends the literature of PVC research and provides new research perspectives. On one hand, although there is a lot of literature on virtual community research, the development and advancement of social technology has brought new environment and meaning to virtual community. Furthermore, there is a lack of professional research on Chinese online communities; thus, our study enriches the corresponding literature. On the other hand, fsQCA was rarely used in previous relevant research, fsQCA technology is a mixed qualitative-quantitative method, which is actually well suited for related research.[96] Therefore, we attempted to use fsQCA to explore the complex conditions of influencing information sharing in PVC, providing new perspectives for relevant future research.

This study provides strategies to improve the effectiveness of information sharing. We combine the natural attributes of PVC with participants' flow experience to examine the information sharing in PVC, which offers an appropriate perspective to help people understand the behaviors and habits of young netizens in PVCs. In particular, we obtained three paths to high effectiveness of information sharing and four paths to non-high effectiveness of information sharing.

First, the results show that the expertise of the PVC and the balance between the abilities of young netizens and the challenges in PVCs are the key influence factors of improving information sharing. In the PVC with high expertise, young netizens with the advantage of ability or experience can collect, identify and use information more effectively. On the contrary, young netizens who are skeptical of their ability to socialize in PVC are more likely to have the lower effectiveness of information acceptance and sharing in the PVC with non-high expertise. This finding is in line with those of Chen, Luo et al and Menshikova,[22,69,97] who emphasized that administrators of PVC could design an information system members' expertise and hobbies.

Second, the influence mechanism of the degree of exclusivity and virtuality on information sharing is complicated in PVC. The results of configuration analysis show that the exclusivity acts as a peripheral condition. It can be inferred that young netizens do not pay much attention to communication restrictions and viewpoint identification in PVCs.[98] It is more in line with their behavioral habits to screen information based on whether they can be used to express their opinions and preferences.[50] For the PVC with high virtuality, which accounts for a large proportion in reality, enhancing the sense of trust in communication is the key to improve the effectiveness of information sharing. This supports the findings of Chen and Hung suggesting that trust is a necessity in information sharing on the Internet.[48]

Third, the influences of clear goals and positive experience of members on the effectiveness of information sharing of the PVC are important but limited. The results of this study show that whether the goal of members is clear is especially important in the PVC with non-high expertise. People with clear goals when socializing in PVC have superior information recognition ability, they can also get more useful content than those who participate in the PVC aimlessly

when there is not much valuable information in the PVC.[99] At the same time, young netizens who have a positive experience when they socialize in PVC are more willing to accept and share information.[100]

Practical Implications

As the key conditions to determine the effectiveness of information sharing in PVC, the expertise of PVC and young netizens' perception of challenge-skill balance need to be pay more attention. According to the results, administrators should strengthen the differentiation of their operational strategies. For the PVC with high expertise or focused topics, the appropriate introduction of professional knowledge or communication mechanism should be added to lower the barrier to communication. For the PVC with non-high expertise or scattered topics, the guiding role of opinion leaders should be strengthened to help young netizens find information that interests them.

According to the influence of peripheral conditions, first, the administrators can set up the verification of joining according to the culture of their PVC when considering the influence of exclusivity, which can help to maintain both their own style and effectiveness of information sharing. Second, for the PVC with high virtuality, it is necessary for the administrators to standardize communication guidelines, avoid the interference of fake or irrelevant information, ensure that young netizens pay attention to real or professional information, and thus build trust among members in PVC. Third, setting up the specific discussion theme or information exchange zone can help young netizens focus on their goals and improve the effectiveness of information sharing in this kind of PVC. Then, Administrators need to optimize information retrieval methods of PVC, create more inclusive atmosphere for communication subculture, beautify communication page, and establish appropriate reward mechanism of information sharing, so as to enhance the positive experience of young netizens.

Limitation and Future Research

In the process of the cases' selection, this study selects the PVCs with a high degree of attention as the object cases based on the results of preliminary investigation. However, the question of which PVC the respondent belongs to was designed as a single-choice question in the survey, which means this study did not to deal with their multidimensional preferences well of netizens who are concerned about different types of virtual communities at the same time. The equivalent paths obtained in this study are mainly applicable to young groups with clear preferences for PVCs. Future research can focus on groups with dispersed attention in different PVCs. In addition, the selection of the respondents in this study is mainly aimed at young netizens in China, which has certain geographical and age limitations.

The diversity of information topics, the decentralization of information dissemination subjects, and differences of the ability in processing information of different people can make different PVCs have obvious differences in their preferences for information adoption and sharing. Therefore, it is still of great research value to explore the differences in information dissemination effectiveness generated by the attributes of PVC and the flow experience of various netizens. On the other hand, the specialization of topics and fragments of information in PVC tend to produce special social cultures. Unlike the mainstream cultural values on public information platforms, there may be more private subcultural phenomena in PVC. For the above phenomena, the related researches on the formation mechanism, propagation path, and derivation results have not attracted enough attention and need to be further explored.

Conclusion

With the development of social networking, PVC is becoming one of the most important channels for young people to obtain information and exchange opinions by relying on its advantages such as diverse communication methods, centralized information, private member relationships, and professional communication topics. Compared with traditional information portal platforms, PVCs have obvious advantages in terms of ability to gather the masses and efficiency of communication. There are important theoretical and practical values to explore and reveal the behavior and habits of information sharing among young netizens of PVCs. This research is aimed at Chinese young netizens and analyzes the influence mechanism of the attributes of the PVC and the flow experience on the effectiveness of information sharing. By employing fsQCA method, three types of equivalent configurations that can achieve high effectiveness of information sharing and four types of equivalent configurations that achieve non-high effectiveness of information sharing are developed. The progress made in this study can help people understand the behaviors and habits of young netizens in

PVCs and explore the strategies to improve the effectiveness of information sharing. In PVC, various types of information can be shared and disseminated more quickly and more intensively, the huge differences in information types, discourse systems, and forms of expression among different PVCs provide a broad space for future research.

Ethics Statement

The body of work comprising this paper is entirely original and none of it has been previously published. Informed consent was obtained from all participants in this study prior to their participation. The study has been reviewed and approved by the ethics committee of Tiangong University.

Funding

Humanity and Social Science Youth Foundation of Ministry of Education (19YJCZH268).

Disclosure

The authors report no conflicts of interest in relation to this work and declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Tamjidyamcholo A, Baba MSB, Shuib NLM, Rohani VA. Evaluation model for knowledge sharing in information security professional virtual community. *Comput Security*. 2014;43:19–34. doi:10.1016/j.cose.2014.02.010
2. Hagel J. Net gain: expanding markets through virtual communities. *J Interact Market*. 1999;13(1):55–65. doi:10.1002/(SICI)1520-6653-(199924)13:1<55::AID-DIR5>3.0.CO;2-C
3. Lin M-J-J, Hung S-W, Chen C-J. Fostering the determinants of knowledge sharing in professional virtual communities. *Comput Human Behav*. 2009;25(4):929–939. doi:10.1016/j.chb.2009.03.008
4. Fernandez-Lores S, Crespo-Tejero N, Fernández-Hernández R. Driving traffic to the museum: the role of the digital communication tools. *Technol Forecast Soc Change*. 2022;174:121273. doi:10.1016/j.techfore.2021.121273
5. Tajvidi M, Richard M-O, Wang Y, Hajli N. Brand co-creation through social commerce information sharing: the role of social media. *J Bus Res*. 2020;121:476–486. doi:10.1016/j.jbusres.2018.06.008
6. Lin X, Wang X. Examining gender differences in people's information-sharing decisions on social networking sites. *Int J Inf Manage*. 2020;50:45–56. doi:10.1016/j.ijinfomgt.2019.05.004
7. Kim M, Jun M, Han J. The relationship between needs, motivations and information sharing behaviors on social media: focus on the self-connection and social connection. *Asia Pacific J Market Logist*. 2022. doi:10.1108/APJML-01-2021-0066
8. Masood A, Zhang Q, Ali M, Cappiello G, Dhir A. Linking enterprise social media use, trust and knowledge sharing: paradoxical roles of communication transparency and personal blogging. *J Knowl Manage*. 2022. doi:10.1108/JKM-11-2021-0880
9. Lu J, Weber I. State, power and mobile communication: a case study of China. *N Media Soc*. 2016;9(6):925–944. doi:10.1177/1461444807082640
10. CNNIC. The 49th statistical report on China's internet development. Available from: http://www.cnnic.com.cn/IDR/ReportDownloads/202204/P020220424336135612575.pdf. Accessed November 25, 2022.
11. Liao S-H, Widowati R, Hsieh Y-C. Investigating online social media users' behaviors for social commerce recommendations. *Technol Soc*. 2021;66:101655. doi:10.1016/j.techsoc.2021.101655
12. Zhang M, Xu P, Ye Y. Trust in social media brands and perceived media values: a survey study in China. *Comput Human Behav*. 2022;127:107024. doi:10.1016/j.chb.2021.107024
13. Li F, Ma J, Tong Y. Livestreaming in tourism: what drives tourism live streamers to share their travel experiences? *Tour Rev*. 2022. doi:10.1108/TR-09-2021-0420
14. Zhu T, Zhang L, Zeng C, Liu X. Rethinking value co-creation and loyalty in virtual travel communities: how and when they develop. *J Retail Consumer Services*. 2022;69:103097. doi:10.1016/j.jretconser.2022.103097
15. Priharsari D, Abedin B. What facilitates and constrains value co-creation in online communities: a sociomateriality perspective. *Inform Manage*. 2021;58(6):103433. doi:10.1016/j.im.2021.103433
16. He D, Yao Z, Tang P, Ma Y. Impacts of different interactions on viewers' sense of virtual community: an empirical study of live streaming platform. *Behav Inf Technol*. 2022;1–21. doi:10.1080/0144929X.2022.2053884
17. Shen Z, Zhong Z, Xie J, Zhang Q, Li S. The effects of information-seeking behaviors on risk perception during the COVID-19 pandemic: a cross-sectional correlational survey. *Psychol Res Behav Manag*. 2022;15:1707–1719. doi:10.2147/PRBM.S368537
18. Jarvenpaaa SL, Staplesb DS. The use of collaborative electronic media for information sharing: an exploratory study of determinants. *J Strat Inform Syst*. 2000;9(2–3):129–154. doi:10.1016/S0963-8687(00)00042-1
19. Rolls K, Hansen M, Jackson D, Elliott D. How health care professionals use social media to create virtual communities: an integrative review. *J Med Internet Res*. 2016;18(6):e166. doi:10.2196/jmir.5312
20. Chandra NV, Hsiao R, Shapiro H, et al. Women in cardiology twitter network: an analysis of a global professional virtual community from 2016 to 2019. *J Am Heart Assoc*. 2021;10(5):e019321. doi:10.1161/JAHA.120.019321
21. Shi Z. Relationship between social exchanges and financial performance: examining a virtual community sponsored by a cloud provider. *Int J Electron Commerce*. 2022;26(3):355–387. doi:10.1080/10864415.2022.2076198

22. Luo C, Lan Y, Luo X, Li H. The effect of commitment on knowledge sharing: an empirical study of virtual communities. *Technol Forecast Soc Change*. 2021;163:120438. doi:10.1016/j.techfore.2020.120438
23. Bock G-W, Ahuja MK, Suh A, Yap LX. Sustainability of a virtual community: integrating individual and structural dynamics. *J Assoc Inform Syst*. 2015;16(6):418–447. doi:10.17705/1jais.00400
24. González-Anta B, Orengo V, Zornoza A, Peñarroja V, Martínez-Tur V. Understanding the sense of community and continuance intention in virtual communities: the role of commitment and type of community. *Soc Sci Comput Rev*. 2021;39(3):335–352. doi:10.1177/0894439319859590
25. Dong L, Huang L, Hou JJ, Liu Y. Continuous content contribution in virtual community: the role of status-standing on motivational mechanisms. *Decis Support Syst*. 2020;132:113283. doi:10.1016/j.dss.2020.113283
26. Koh J, Kim Y-G, Kim Y-G. Sense of virtual community: a conceptual framework and empirical validation. *Int J Electron Commerce*. 2014;8(2):75–94. doi:10.1080/10864415.2003.11044295
27. Zhou J, Kishore R, Zuo M, Liao R, Tang X. Older adults in virtual communities: understanding the antecedents of knowledge contribution and knowledge seeking through the lens of socioemotional selectivity and social cognitive theories. *J Knowl Manage*. 2021;26(4):972–992. doi:10.1108/jkm-02-2021-0087
28. Yong L, Sachau D, Lassiter A. Developing a measure of virtual community citizenship behavior. *Knowl Manag E-Learn*. 2011;3(4):682–696.
29. Deng X, Gao B, Chen L. Support while control: the influence of embeddedness on virtual community participation. *Library Hi Tech*. 2019;38(3):625–637. doi:10.1108/lht-09-2018-0133
30. Kim DJ, Salvacion M, Salehan M, Kim DW. An empirical study of community cohesiveness, community attachment, and their roles in virtual community participation. *Eur J Inf Syst*. 2022;1–28. doi:10.1080/0960085X.2021.2018364
31. Chung N, Nam K, Koo C. Examining information sharing in social networking communities: applying theories of social capital and attachment. *Telemat Inform*. 2016;33(1):77–91. doi:10.1016/j.tele.2015.05.005
32. Liang C, Chang -C-C, Rothwell W, Shu K-M. Influences of organizational culture on knowledge sharing in an online virtual community. *J Organ End User Comput*. 2016;28(4):15–32. doi:10.4018/joeuc.2016100102
33. Hong Y, Wan M, Li Z. Understanding the health information sharing behavior of social media users: an empirical study on WeChat. *J Organ End User Comput*. 2021;33(5):180–203. doi:10.4018/JOEUC.20210901.oa9
34. Cai Y, Shi W. The influence of the community climate on users' knowledge-sharing intention: the social cognitive theory perspective. *Behav Inf Technol*. 2020;41(2):307–323. doi:10.1080/0144929x.2020.1808704
35. Wang N, Yin J, Ma Z, Liao M. The influence mechanism of rewards on knowledge sharing behaviors in virtual communities. *J Knowl Manage*. 2021;26(3):485–505. doi:10.1108/jkm-07-2020-0530
36. Chen X, Ma J, Wei J, Yang S. The role of perceived integration in WeChat usages for seeking information and sharing comments: a social capital perspective. *Inform Manage*. 2021;58(1):103280. doi:10.1016/j.im.2020.103280
37. Han J, Guo G, Hong L. Impact of professionally facilitated peer support for family carers of people with dementia in a WeChat virtual community. *J Telemed Telecare*. 2022;28(1):68–76. doi:10.1177/1357633x20910830
38. Zhao L, John N. The concept of "sharing" in Chinese social media: origins, transformations and implications. *Inform Commun Soc*. 2022;25(3):359–375. doi:10.1080/1369118X.2020.1791216
39. Wang H, Xiong L, Wang C, Chen N. Understanding Chinese mobile social media users' communication behaviors during public health emergencies. *J Risk Res*. 2022;25(7):874–891. doi:10.1080/13669877.2022.2049621
40. Yang Z, Zhou Q, Chiu DKW, Wang Y. Exploring the factors influencing continuous usage intention of academic social network sites. *Online Inform Rev*. 2022;46(7):1225–1241. doi:10.1108/OIR-01-2021-0015
41. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.
42. Wu J, Li Y, Zhang D. Identifying women's entrepreneurial barriers and empowering female entrepreneurship worldwide: a fuzzy-set QCA approach. *Int Entrepren Manage J*. 2019;15(3):905–928. doi:10.1007/s11365-019-00570-z
43. Kim J, Lee C, Elias T. Factors affecting information sharing in social networking sites amongst university students: application of the knowledge-sharing model to social networking sites. *Online Inform Rev*. 2015;39(3):290–309. doi:10.1108/OIR-01-2015-0022
44. Guo L, Zhang M, Kang K, Hu M. Transforming followers into fans: a study of Chinese users of the WeChat official account. *Online Inform Rev*. 2017;41(7):1029–1045. doi:10.1108/oir-01-2016-0013
45. Chiu C-M, Hsu M-H, Wang ETG. Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories. *Decis Support Syst*. 2006;42(3):1872–1888. doi:10.1016/j.dss.2006.04.001
46. Hyun H, Thavisay T, Lee SH. Enhancing the role of flow experience in social media usage and its impact on shopping. *J Retail Consumer Services*. 2022;65:102492. doi:10.1016/j.jretconser.2021.102492
47. Preece J. Sociability and usability in online communities: determining and measuring success. *Behav Inf Technol*. 2010;20(5):347–356. doi:10.1080/01449290110084683
48. Chen C-J, Hung S-W. To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities. *Inform Manage*. 2010;47(4):226–236. doi:10.1016/j.im.2010.03.001
49. Lee FSL, Vogel D, Limayem M. *Virtual Community Informatics: What We Know and What We Need to Know*. IEEE; 2002:2863–2872.
50. Wagner C, Liu L, Schneider C, Prasarnphanich P, Chen H. *Creating a Successful Professional Virtual Community: A Sustainable Digital Ecosystem for Idea Sharing*. IEEE; 2009:163–167.
51. Fu K-W, Chan C-H, Chau M. Assessing censorship on microblogs in China: discriminatory keyword analysis and the real-name registration policy. *IEEE Internet Comput*. 2013;17(3):42–50. doi:10.1109/MIC.2013.28
52. Preece J. *Online Communities: Designing Usability and Supporting Socialbilty*. John Wiley & Sons, Inc.; 2000.
53. Chen Y-J. Ontology-based empirical knowledge verification for professional virtual community. *Behav Inf Technol*. 2011;30(5):555–586. doi:10.1080/0144929x.2010.549512
54. Reichheld FF, Schefter P. E-loyalty: your secret weapon on the web. *Harv Bus Rev*. 2000;78(4):105–113.
55. Foster MK, Abbey A, Callow MA, Zu X, Wilbon AD. Rethinking virtuality and its impact on teams. *Small Group Res*. 2015;46(3):267–299. doi:10.1177/1046496415573795

56. Chen G-L, Yang S-C, Tang S-M. Sense of virtual community and knowledge contribution in a P3 virtual community. *Internet Res*. 2013;23(1):4–26. doi:10.1108/10662241311295755
57. Rheinberg F, Engeser S. Intrinsic motivation and flow. In: Heckhausen J, Heckhausen H, editors. *Motivation and Action*. Springer International Publishing; 2018:579–622.
58. Csikszentmihalyi M. *Beyond Boredom and Anxiety*. Jossey-Bass; 1975.
59. Csikszentmihalyi M. *Flow and the Psychology of Discovery and Invention*. Harper Perennial; 1997:39.
60. Csikszentmihalyi M. *Flow: The Psychology of Optimal Experience*. Vol. 1990. Harper & Row New York; 1990.
61. Pelet J-É, Ettis S, Cowart K. Optimal experience of flow enhanced by telepresence: evidence from social media use. *Inform Manage*. 2017;54(1):115–128. doi:10.1016/j.im.2016.05.001
62. Hoffman DL, Novak TP. Marketing in hypermedia computer-mediated environments: conceptual foundations. *J Mark*. 1996;60(3):50–68. doi:10.1177/002224299606000304
63. Herrando C, Jimenez-Martinez J, Hoyos MJ. From sPassion to sWOM: the role of flow. *Online Inform Rev*. 2018;42(2):191–204. doi:10.1108/OIR-09-2016-0243
64. Agarwal R, Karahanna E. Time flies when you're having fun: cognitive absorption and beliefs about information technology usage. *MIS Quarter*. 2000;24(4):665–694. doi:10.2307/3250951
65. Koufaris M. Applying the technology acceptance model and flow theory to online consumer behavior. *Inform Syst Res*. 2002;13(2):205–223. doi:10.1287/isre.13.2.205.83
66. Jackson SA, Marsh HW. Development and validation of a scale to measure optimal experience: the flow state scale. *J Sport Exerc Psychol*. 1996;18(1):17–35. doi:10.1123/jsep.18.1.17
67. Li D, Browne GJ, Wetherbe JC. Why do internet users stick with a specific web site? A relationship perspective. *Int J Electron Commerce*. 2006;10(4):105–141. doi:10.2753/jec1086-4415100404
68. Lin J, Lin S, Turel O, Xu F. The buffering effect of flow experience on the relationship between overload and social media users' discontinuance intentions. *Telemat Inform*. 2020;49:101374. doi:10.1016/j.tele.2020.101374
69. Chen H. Flow on the net–detecting Web users' positive affects and their flow states. *Comput Human Behav*. 2006;22(2):221–233. doi:10.1016/j.chb.2004.07.001
70. Procci K, Singer AR, Levy KR, Bowers C. Measuring the flow experience of gamers: an evaluation of the DFS-2. *Comput Human Behav*. 2012;28(6):2306–2312. doi:10.1016/j.chb.2012.06.039
71. Csikszentmihalyi M, Csikszentmihalyi IS. *Optimal Experience: Psychological Studies of Flow in Consciousness*. Cambridge University Press; 1992.
72. Jackson SA, Eklund RC. Assessing flow in physical activity: the flow state scale-2 and dispositional flow scale-2. *J Sport Exerc Psychol*. 2002;24(2):133–150. doi:10.1123/jsep.24.2.133
73. Wang -C-C, Hsu M-C. An exploratory study using inexpensive electroencephalography (EEG) to understand flow experience in computer-based instruction. *Inform Manage*. 2014;51(7):912–923. doi:10.1016/j.im.2014.05.010
74. Lee SM, Chen L. The impact of flow on online consumer behavior. *J Comput Inf Syst*. 2010;50(4):1–10. doi:10.1080/08874417.2010.11645425
75. Chiu C-M, Wang ETG, Shih F-J, Fan Y-W. Understanding knowledge sharing in virtual communities: an integration of expectancy disconfirmation and justice theories. *Online Inform Rev*. 2011;35(1):134–153. doi:10.1108/14684521111113623
76. Shin SK, Ishman M, Sanders GL. An empirical investigation of socio-cultural factors of information sharing in China. *Inform Manage*. 2007;44(2):165–174. doi:10.1016/j.im.2006.11.004
77. Yan J, You Y, Wang Y, Sheng D, Xin B. Understanding the complexity of business information dissemination in social media: a meta-analysis of empirical evidence from China. *Complexity*. 2021;2021:1–13. doi:10.1155/2021/7647718
78. Cheung CMK, Lee MKO, Rabjohn N. The impact of electronic word-of-mouth. *Internet Res*. 2008;18(3):229–247. doi:10.1108/10662240810883290
79. Savolainen R. Information sharing and knowledge sharing as communicative activities. *Inform Res*. 2017;22(3):20.
80. Zhang N, Huang H, Su B, Zhao J, Zhang B. Information dissemination analysis of different media towards the application for disaster pre-warning. *PLoS One*. 2014;9(5):e98649. doi:10.1371/journal.pone.0098649
81. Leimeister JM, Ebner W, Krcmar H. Design, implementation, and evaluation of trust-supporting components in virtual communities for patients. *J Manag Inform Syst*. 2014;21(4):101–131. doi:10.1080/07421222.2005.11045825
82. Koh J, Kim YG. Knowledge sharing in virtual communities: an e-business perspective. *Expert Syst Appl*. 2004;26(2):155–166. doi:10.1016/s0957-4174(03)00116-7
83. CPC Central Committee and the State Council. The middle- and long-term youth development plan (2016–2025). Available from: http://english.www.gov.cn/policies/latest_releases/2017/04/14/content_281475626290850.htm. Accessed November 25, 2022.
84. Jiang F, Zheng X, Fan D, Zhang P, Li S. The sharing economy and business model design: a configurational approach. *J Manag Stud*. 2021;58(4):949–976. doi:10.1111/joms.12711
85. Misangyi VF, Greckhamer T, Furnari S, Fiss PC, Crilly D, Aguilera R. Embracing causal complexity: the emergence of a neo-configurational perspective. *J Manage*. 2017;43(1):255–282. doi:10.1177/0149206316679252
86. Navarro S, Llinares C, Garzon D. Exploring the relationship between co-creation and satisfaction using QCA. *J Bus Res*. 2016;69(4):1336–1339. doi:10.1016/j.jbusres.2015.10.103
87. Ragin CC. *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. University of Chicago Press; 2009.
88. Fiss PC. A set-theoretic approach to organizational configurations. *Acad Manag Rev*. 2007;32(4):1180–1198. doi:10.5465/amr.2007.26586092
89. Ragin CC. *Fuzzy-Set Social Science*. University of Chicago Press; 2000.
90. Ragin CC. Fuzzy sets: calibration versus measurement. Methodology volume of Oxford handbooks of political science. 2007.
91. Ong WJ, Johnson MD. Towards a configural theory of job demands and resources. *Acad Manage J*. 2021. doi:10.5465/amj.2020.0493
92. Schneider MR, Schulze-Bentrop C, Paunescu M. Mapping the institutional capital of high-tech firms: a fuzzy-set analysis of capitalist variety and export performance. *J Int Bus Stud*. 2010;41(2):246–266. doi:10.1057/jibs.2009.36
93. Du Y, Kim PH. One size does not fit all: strategy configurations, complex environments, and new venture performance in emerging economies. *J Bus Res*. 2021;124:272–285. doi:10.1016/j.jbusres.2020.11.059

94. Poorkavoos M, Duan Y, Edwards JS, Ramanathan R. Identifying the configurational paths to innovation in SMEs: a fuzzy-set qualitative comparative analysis. *J Bus Res*. 2016;69(12):5843–5854. doi:10.1016/j.jbusres.2016.04.067
95. Greckhamer T, Furnari S, Fiss PC, Aguilera RV. Studying configurations with qualitative comparative analysis: best practices in strategy and organization research. *Strat Organ*. 2018;16(4):482–495. doi:10.1177/1476127018786487
96. Kraus S, Ribeiro-Soriano D, Schüssler M. Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research – the rise of a method. *Int Entrepren Manage J*. 2018;14(1):15–33. doi:10.1007/s11365-017-0461-8
97. Menshikova A. Evaluation of expertise in a virtual community of practice: the case of stack overflow. *Digit Transform Glob Soc*. 2018;483–491:chapChapter 40. Communications in Computer and Information Science.
98. Lee G, Suzuki A. Motivation for information exchange in a virtual community of practice: evidence from a Facebook group for shrimp farmers. *World Dev*. 2020;125:104698. doi:10.1016/j.worlddev.2019.104698
99. Hong J-C, Hwang M-Y, Tai K-H, Lin P-H. The effects of intrinsic cognitive load and gameplay interest on flow experience reflecting performance progress in a Chinese remote association game. *Comput Assist Lang Learn*. 2019;34(3):358–378. doi:10.1080/09588221.2019.1614068
100. Tse DCK, Nakamura J, Csikszentmihalyi M. Living well by "flowing" well: the indirect effect of autotelic personality on well-being through flow experience. *J Posit Psychol*. 2020;16(3):310–321. doi:10.1080/17439760.2020.1716055