A study on the Configuration path of the communication effect of urban short videos: fsQCA analysis based on socio-technical systems theory

Zhaoyu lu[1]

1 Faculty of Letters and Journalism and Communication, Chengdu University, Chengdu, Si Chuan, China, 610106

Abstract: Urban short videos have become an important vehicle to promote city branding, cultural communication and economic development. This study adopts the fuzzy set stereotyping comparative analysis (fsQCA) method to analyse 120 sample cases based on the Jieyin platform by focusing on two dimensions, namely, social and technological, and refining antecedent variables such as content theme, emotional tendency, topic guidance, title length, content duration and presentation form. It is found that there are three configurations of high communication effect of urban short videos, namely, socially dominant, technologically dominant and socio-technical synergistic. Positive emotional tendency and medium content length are indispensable conditions for efficient communication of urban short videos, and at the same time, based on the precise grasp of the communication subject on the tone of the content, we should also flexibly adopt differentiated strategies, and maximise the communication effect of urban short videos through the coupling of multi-dimensional elements. The effect is maximised through the coupling and linkage of multi-dimensional elements.

Keywords: urban communication; short video; socio-technical system theory; fsQCA

1.Introduction

Many studies in recent years have found that short videos have become an important way to publicise urban resources and help the economic and cultural construction of cities. Short video communication is characterised by a large audience base, strong topicality and rapid fermentation of content. Recently, local cultural and tourism departments and tourist attractions have created a number of phenomenal 'net red cities' and 'popular places to visit' with the help of short videos, reconstructing urban spatial memory through scenario-based narratives, and realising accurate reach with the help of algorithmic recommendations, which have become an important way to improve the image of cities and promote local development. Short videos have become an important booster for improving city image and promoting local development. At present, there are a large number of academic results on urban short videos. Some studies have explored the construction of city image by short videos from the dimension of communication process, analyses how the self-media style can find another way to form a new path of city image construction, and researchers have also examined the influence of short food videos on tourists' behavioural intention. In general, the existing research results provide intellectual support for optimising the communication efficacy of urban short videos and promoting the city's image. This paper argues that the dissemination of urban short videos involves not only technical elements such as editing style and presentation form, but also human

factors. Therefore, it is necessary to summarise the effective paths of urban communication from urban short videos with a systematic concept, and reveal the synergistic mechanism of urban short video communication. Considering the above aspects, this paper relies on the socio-technical system theory, takes the urban short videos on Jittery platform as the research sample, and adopts the fsQCA method to explore the grouping effect of the communication effect of urban short videos.

2.Theoretical framework and literature review

2.1.Socio-technical system theory

Socio-technical systems theory is a perspective on optimising organisational systems and was developed by Trist, E.L. in his study of the effects of coal mine mechanisation [1]. The theory is based on general systems theory and open systems theory, which states that any organisation is a composite system formed by the nesting of two subsystems, the social system and the technical system. The social subsystem is concerned with the human factors present in the socio-technical system, such as human thoughts, attitudes, perceptions and culture; while the technical subsystem deals with the tools, techniques and equipment required in the socio-technical system to achieve organisational goals and tasks, such as operational processes, task allocation, technical methods and infrastructure. As a theoretical analysis framework, socio-technical systems theory has been widely used in several fields. In the field of risk governance, Wang Qian and Zeng Ruixue provide a foundation of risk analysis for the risk governance of 'digital government'; JU Jingrui and other scholars constructed a general theoretical framework for the change of urban smart governance, and proposed a strategy to deal with the structural risk of the framework through a typical case analysis; In the field of education, Xiao Long explored in depth the mechanism of change of the intelligent work world, and put forward dynamic coping strategies for the higher vocational education in the era of intelligence; Zhao Liang puts forward the 'subject-structure-task' symbiotic linkage in the school organisational field under the background of 'double reduction'. Zhao Liang proposed a symbiotic internal governance paradigm of 'subject-structure-task-technology' in the school organisational field under the background of 'double reduction', which effectively empowers the implementation of the 'double reduction policy'; In the field of communication, Lei Licai and Chen Lumin used the fuzzy qualitative set comparative analysis (fsQCA) method to analyse the paths of efficient dissemination of short videos on health science popularisation.

Socio-technical systems theory emphasises that the evolution of technological systems will drive the transformation of social systems, and the changes in social systems will also counteract the design and implementation of technological systems. This theoretical advantage of emphasising the optimal combination of human and technological factors provides a more systematic analytical framework for this paper to deeply analyse the communication effect of urban image short videos. Urban image short video is essentially a digital communication practice that is created by professional information agencies, distributed on a specific algorithm-driven digital platform, and negotiated through user participation and interaction. Therefore, this paper invokes socio-technical system theory and refers to related studies to deconstruct the production mechanism of urban image short video into two subsystems: the social system and the technological system. In terms of social system, short video publishers produce short video contents that are generally accepted and concerned by most users by choosing user-preferred themes, set up topic guides that are suitable for fission dissemination, and realise the precise reach of urban image short videos with the support of algorithmic push technology; in terms of technical system, short video publishers organically

combine and dynamically adapt the title length, content duration and presentation form to achieve the communication efficiency of urban image short videos. In terms of technical system, short video publishers can maximise the effectiveness of city image short videos through the organic combination and dynamic adaptation of title length, content duration and presentation form.

2.2.The group path of short video communication effect

At present, the academic community's attention to the effect of short video communication mainly focuses on the study of its influencing factors, communication mechanisms and macro strategies. Based on the narrative structure of the short video communication of 'new farmers', some studies have analysed the characteristics of the short video communication of 'new farmers' on the Internet under the platform economy, and explored practical strategies to enhance the effectiveness of the short video communication of 'new farmers'. The analysis analyses the characteristics of the Internet 'new farmers' short video communication under the platform economy, and discusses the practical strategies to improve the effectiveness of 'new farmers' short video communication; or based on SECI model, analyse the dissemination mechanism and logic of health science popularization short video dissemination; or to specifically explore the causes and paths of the good dissemination effect of short videos in public libraries; There are also studies analysing the impact of short video dissemination effect on network sales from the perspective of network marketing. Even though some studies focus on the grouping path of short video communication effect enhancement, there are still few that pay deep attention to city image as a type of short video. Typical results such as the system of factors influencing the communication effect of urban short videos constructed by Liu Jieshi based on the 'heuristic-systematic' model [2], as well as Wang Yanqi's

analysis of the dissemination effect and influencing factors of Chongqing's city image video on YouTube platform from cognitive level, emotional level and behavioural level [3]. Under the perspective of socio-technical systems theory, these studies partly involve some detail-level factors in the communication of urban short videos. However, the communication effect of urban short video is a process of synergistic action of multiple elements, which factors are influencing the communication effect of urban short video, and what kind of group effect is produced by the arrangement and combination of different factors, the existing literature does not give a clear and detailed explanation. It can be said that there is still a lack of research on the grouping path of urban short video communication effect.

3.Research Design

3.1.Research Method

This study adopts the Fuzzy-set Qualitative Comparative Analysis (fsQCA) method to analyse the path of improving the communication effect of urban short videos from an ensemble-theoretic grouping perspective. On the one hand, although traditional case studies on urban short videos are good at abstracting valuable propositions from concrete examples, there are some limitations in exploring how the results can be interpreted by different combinations of conditions; on the other hand, the communication effect of urban short videos, as a complex result involving a variety of conditions, needs a more systematic perspective in order to reveal its intrinsic formation mechanism and enhancement path. The fsQCA method integrates the main ideas of quantitative and qualitative research, and is able to systematically examine the causes of events and the interactions between the internal generating factors, which helps to deepen the understanding of the complex causal relationships behind the events. Based on this, this study adopts the fsQCA method to investigate the group effect and enhancement path of urban short video

communication effects.

3.2.Data source

The data in this article comes from the Jieyin short video platform. As China's largest short-video sharing platform, Jitterbit short-video has nearly 840 million monthly active users and has become a major position for the creation and dissemination of urban short-videos. In order to cover cities with strong competitiveness in terms of economic and cultural development level and other aspects on the ShakeYin short video platform when drawing samples, the researcher selected the top 30 cities from the 'The Beijing News Long-lasting Popular City List Top 30 (2025)' in the construction of the dataset. The Beijing News Long-lasting Popular City List Top 30 (2025) focuses on cities that will receive more than 100 million tourist trips in 2024, and which have created unique and attractive city brands with a large number of high-quality content creators, active interaction data, and unique cultural and natural resource advantages. This list ensures the diversity and representativeness of the sample for this study's dataset.

After determining the list of cities needed for this study, the researcher searched for these 30 cities as search keywords on the Jitterbug short video platform in May 2025, and after eliminating short videos that did not belong to the scope of this study and those that appeared repeatedly, the short videos with the top 4 likes were selected in descending order of hotness to form the case bank containing 120 samples. Overall, these 120 short videos have received a total of 139 million likes, 7.06 million retweets and 21.84 million comments on Jieyin, which has high influence and attention, reflecting the typicality of the samples. Meanwhile, these urban short videos come from 111 account holders from 27 provinces, cities and regions, including Shanghai, Sichuan and Henan, and the content of the videos covers culture, tourism, food, life and folklore, further illustrating the heterogeneity of the sample.

3.3.Variable Selection and Variable Calibration

Conditional variable selection methods include problem-oriented method, theoretical perspective method, research framework method, literature induction method and phenomenon summary method, etc. These methods can be used in fsQCA research in a complementary way, the researcher can combine the above methods depending on the needs of the study. In view of this, in terms of variable selection, this paper adopts the problem-oriented method, the theoretical perspective method and the literature induction method for setting and selecting variables. According to the previous review, this study takes 'improving the communication effect of urban short videos' as the problem orientation, and invokes the socio-technical system theory to hypothesise the conditional variables from the theoretical perspective, and summarises the conditional variables of urban short videos into the social system and the technological system, with the social system focusing on human factors in the communication of urban short videos, including the content, theme, emotional tendency and topic guidance. The social system focuses on the human factors in urban short video dissemination, including content, subject matter, emotional tendency and topic guidance; while the technical system focuses on the technical means required to achieve the dissemination effect of urban short videos, including title length, content duration and presentation form. In terms of variable calibration, the data of each variable of the 120 short video cases need to be calibrated to a value between 0 and 1 according to the degree of affiliation [4]. Through collation and generalisation, the researcher grouped the seven selected variables into categorical variables (content theme, emotional tendency, presentation form) and continuous variables (communication effect, topic guidance, title length, content duration), and adopted different variable calibration methods. The categorical variables take an indirect calibration method based on Pappas et al.'s

study[5], this paper assigns a value from 0 to 1 based on the data weights of the collected cases. The closer the value is to 1, the higher its affiliation to the outcome variable; continuous variables are directly calibrated using the direct calibration method according to Charles 's methodology [6], three calibration anchors were set for the case data at 95%, 50%, and 5%, corresponding to the fully affiliated, crossover, and fully unaffiliated values, respectively. The results of variable assignment are shown in Tables 1 and 2.

3.3.1.Communication effect

The Communication effect is the result of the comprehensive influence of users on urban short videos at the level of information reception, cognition, attitude and behaviour. Some studies have shown that in the dissemination of short videos, users' liking, commenting and retweeting behaviours can represent users' emotions to different degrees [7]. In order to comprehensively reflect the effect of urban short video dissemination, this paper draws on the weight calculation method of Jitterbug Interaction Index in Qingbo Index [8], which takes the logarithm and weights the number of likes, comments and retweets to arrive at the city short video communication effect index. Qingbo index is an index system used to quantitatively measure the operation and communication effect of new media, and its unique algorithmic formulas of WCI, BCI, and TGI have been quoted by many central and top 500 enterprises, which have strong practicality and scientificity. The operation formula is shown in Figure 1, C is the city short video communication effect index, X is the number of likes, Y is the number of comments, Z is the number of retweets, and m is the sample serial number.The details are as follows:

$$C_m=[0.17\ln(X_m+1)+0.37\ln(Y_m+1)+0.46\ln(Z_m+1)]\times100$$

3.3.2.Content topic

Content theme is the core issue of the short video focus, which is a high degree of summary of the video content. It is a high level summary of the video content. Some studies have pointed out that the content with the theme of 'three farmers' can achieve the purpose of shaping the image of 'three farmers' [9], which fully demonstrates the importance of the content theme for the communication effect of short videos. Combined with the case content, this paper categorises the content themes of urban short videos as urban landscape, urban life, urban emotion, and content themes that contain at least the above 2 types. According to the 'four-valued fuzzy set calibration method' in fsQCA method, this paper assigns the value of 1 to the short video with only urban landscape, 0.67 to the short video containing at least the above two types of content themes, 0.33 to the short video with only urban life, and 0 to the short video with only urban emotion.

3.3.3.Emotional tendency

Emotional tendency is the tendency that users show in their emotional attitude towards urban short video content. It has been shown the direct impact of users' attitudes and affective tendencies on communication effects [10], so this study takes the emotional tendency of users as one of the conditional variables and further divides the emotional tendency into two categories according to the ' four-valued fuzzy set calibration method. 'The affective tendency is further classified into positive, neutral, negative and no obvious emotion, and assigned the values of 1, 0.33, 0 and 0.67, respectively.

3.3.4.Topic guidance

Presetting the topic hashtag '#' and designing guide words in short video content can lead users to interact more around the topic[11], helping video productions to successfully enter a larger 'traffic pool', thus increasing the exposure and interaction rate of short videos. The more guidance tags added, the stronger the topic guidance purpose of short video creators. Accordingly, topic guidance of urban short videos will be measured by counting the number of tags in the case title.

3.3.5.Title length

Title length is an important factor that affects the effectiveness of video distribution. A study reveals the negative correlation between title length and communication effect, suggesting that the more concise the title is, the more attractive the video is to users[12]. Therefore, this study included title length as one of the conditional variables of the study, which was measured by calculating the number of characters of titles in the sample.

3.3.6.Content duration

There is a clear correlation between content duration and the effectiveness and impact of content play. Short video saves users' time cost of receiving information, and when the content duration changes, viewers will put forward new demands on its content quality [13]. Urban short video as one of the main carriers of city image communication in the digital media era, its duration should be accurately adapted to the user's attention law and information consumption needs, so this study takes the content duration of short video as a conditional variable, and measures the duration data of the samples in the unit of seconds.

3.3.7.Presentation form

Presentation form of short videos refers to the expression framework in which short video content can be presented. Research has shown that the presentation form of short videos also affects their dissemination effect [14]. Therefore, this paper takes the presentation form of short videos as a conditional variable to measure the communication effect of urban short videos. By generalising the cases, the presentation forms are classified into four categories: vlog, clip, oral and drama, and are calibrated with a four-point equal variance based on the degree of affiliation, assigned values of 1, 0.67, 0.33 and 0.

Table 1. Assignment rules for continuous variables

Variable category	Variable name	anchor point		
		Full affiliation Degree of affiliation = 0.95	Intersection Affiliation = 0.5	Not affiliated at all Degree of affiliation = 0.05
Outcome variables	Communication effect	381.7532671	208.0876781	73.75506619
Conditional variables	Topic guidance	5.05	3	0
	Title length	51.05	20	7
	Content duration	190.2	26	5

Table 2. Rules for assigning values to categorical variables

Variable category	Variable name	Variable content	Variable assignment
Conditional variable	Content topic	cityscape	1
		contains at least 2 types of content topics	0.67
		city life	0.33
		city emotions	0
	Emotional	positive emotions	1

tendency	no visible emotion	0.67
	neutral emotion	0.33
	negative emotion	0
	vlog	1
Presentation	clips	0.67
form	spoken word	0.33
	storyline	0

4.Research Findings

4.1.Necessity analysis of individual variables

Before conducting a group analysis of the communication effect of urban short videos, it is first necessary to determine whether there is a single variable that constitutes a necessary condition for the outcome variable. In the stereotypical comparative analysis, when the consistency level of a single variable is greater than 0.9, the corresponding variable can be regarded as a necessary condition for the generation of the outcome. In this study, after importing the calibrated data into fsQCA4.1, 12 variables were finally obtained for calculation, and the results are shown in Table 3. It can be found that the highest consistency level of a single variable is 0.891711, all of which are lower than the judgement standard of 0.9, indicating that a single variable is not sufficiently necessary to constitute a sufficiently necessary condition for the dissemination effect of urban short videos, and a group effect analysis is needed.

Table 3. Necessity of a single variable to analyse the results

Conditional Variables	Result			
	High communication effect		Non-high communication effect	
	Consistency	Coverage	Consistency	Coverage
Content topic	0.734426	0.530972	0.820550	0.621792
~Content topic	0.476873	0.717146	0.381045	0.600616
Emotional tendency	0.889060	0.531531	0.891711	0.558775
~Emotional tendency	0.261990	0.697727	0.252402	0.704545
Topic guidance	0.600102	0.565000	0.730500	0.720874
~Topic guidance	0.703533	0.713519	0.559192	0.594426
Title length	0.605393	0.619672	0.665201	0.713662
~Title length	0.720260	0.672403	0.645498	0.631613
Content duration	0.561700	0.644157	0.574010	0.689959
~Content duration	0.729647	0.620374	0.703957	0.627340
Presentation form	0.836320	0.554111	0.863865	0.599910
~Presentation form	0.396143	0.735192	0.357922	0.696231

4.2.Analysis of group effects

In order to deeply explore the synergistic linkage effect of the factors influencing the dissemination effect of urban short videos, this study carries out a group state analysis of the antecedent conditions that form a high dissemination effect. According to the sample size of this study, combined with the relevant experience of existing studies, this paper sets the original consistency threshold at 0.75, the PRI consistency threshold at 0.7, and the case frequency threshold at 1 when constructing the truth table, and then standardises the analysis to arrive at three types of solutions, including complex, intermediate and simple solutions. The intermediate solution, which is reasonably well-documented and of moderate complexity, is usually the first choice for interpretation in fsQCA analysis, and its advantage is that it avoids the overly redundant delineation of the grouping relationship in the complex solution, and also circumvents the inadequacy of the expression of the grouping path mechanism in the parsimonious solution. In view of this, in this paper, the conditions that exist in both intermediate and parsimonious solutions are regarded as core conditions, and the conditions that appear only in intermediate solutions are regarded as edge conditions, and the final results are shown in Table 4.

Table 3. Results of group path analysis of urban short video dissemination effect

Conditional Variables	Configuration path			
	Configuration1	Configuration2	Configuration3	Configuration4
Content Topic		◎	◎	◎
Emotional tendency	●		●	◎
Topic guidance	◎	◎	◎	●
Title length	◎	◎		◎
Content Duration	◎	●	●	◎
Presentation form		◎	◎	◎
Original coverage	0.227172	0.122888	0.13603	0.0433521
Unique Coverage	0.138761	0.00972861	0.0245775	0.0102406
Consistency	0.907913	0.888889	0.888517	0.923636
Solution Coverage	0.301758			

Consistency of solutions	0.893381

Note: ● indicates that the core condition exists; ● indicates that the marginal condition exists; ◎ indicates that the core condition is missing; ◎ indicates that the marginal condition is missing; a blank space indicates that the condition can be present or missing.

As can be seen from Table 4, there are five groupings leading to the high dissemination effect of urban short videos, and the consistency level of the overall solution is 0.89338, and the consistency levels of the individual groupings are 0.907913, 0.888889, 0.888517, and 0.923636, respectively, and the consistency levels of the overall solution and the individual solutions are higher than 0.75, which indicates that these four paths have good explanatory power for the urban short videos to obtain good communication effects, indicating that all four paths have good explanatory power. In terms of coverage, the overall coverage of the four paths is 0.301758, indicating that the results can reveal more than 30% of the sample cases, and the model effect is relatively good for medium-volume samples. In order to better identify the homogeneity and heterogeneity among the grouping paths, based on the distribution of the core conditions, this study further generalises the above four paths into three grouping configurations: socially dominant, technologically dominant, and socio-technologically synergistic.

4.2.1.Type of social dominance

The socially-led configuration emphasises the role of human factors in the socio-technical system on the communication effectiveness of urban short videos, which corresponds to configuration 1 and 4 in this study. in configuration 1, positive emotional tendency becomes the core element driving the communication effectiveness of urban short videos. Even though the video publisher did not set a significant topic-led framework, and the technical parameters such as title length and content

duration were not in the optimal dissemination interval, the video was still able to form fission dissemination by triggering emotional resonance among users. This emotion-driven mode not only realises the spontaneous continuation of the communication chain, but also evokes users' deeper sense of identity with the city, forming a powerful communication potential beyond the technical constraints. For example, @ElephantNews released the work 'July 20 Zhengzhou, Henan, Longhai Road, water flow turbulence, a line of people were washed down, a big brother even if the pull up # Henan power in the rainstorm # Henan rainstorm interaction' Although it took a relatively rough video production, the picture quality is also more general, but the video focus on the emergence of warmth and mutual help scenes in Henan rainstorms, the capture of this glory of human nature, which makes the audience in the process of watching the short video spontaneous However, the video focuses on the warm scenes of mutual help that emerged during the rainstorm in Henan Province, which captures the glory of humanity and allows the audience to spontaneously sublimate the act of mutual help into a collective identity for the city of Zhengzhou. The video has accumulated 8.97 million likes, and triggered comments from nearly 580,000 users and retweets from nearly 400,000 users, which has achieved a good communication effect. In group state 4, when elements such as content theme, emotional inclination, title length, content duration, presentation form, etc. are all missing in the form of core or marginal conditions, the short video quickly establishes a connection with users by setting specific topic keywords. For example, the short video released by @ Handan Culture and Tourism, 'You look so beautiful when you work seriously! Handan is waiting for you! #Handan #When topping the chicken nest head to explain to Zhou Tao #Zhou Tao came to Handan #Congtai Park

#Hand love pulse Dan waiting for you to come' is to cater to the audience's preference for interesting events and hot topics, etc., and set up a high degree of discussion of the key words as a guide to successfully attract the user's likes, retweets and attention.

4.2.2.Type of technology dominance

The technology-led configuration emphasises the leading role of technological conditions in the socio-technical system for the communication effect of urban short videos, which in this study corresponds to configuration 2. In configuration 2, ~content theme, ~topic guidance, ~title length, and ~presentation form are the core conditions, and good communication effect can also be achieved when the content length is a marginal condition. This suggests that regardless of the topic and type of urban short videos, when the video length is of medium duration, the short video can achieve good dissemination effects. The data from the sample of this study showed that the 20th and 80th percentile of the antecedent condition of content duration were 9 seconds and 69.6 seconds, respectively, and the median (50th percentile) was 26 seconds. This means that 60% of the sample content duration is concentrated between 9 seconds and 69.6 seconds and the median is 26 seconds, reflecting the existence of a rigid demand for medium-length videos among users of short video platforms. Compared with fragmented minimalist content or longer in-depth content, medium-length videos can efficiently present the core city points of interest or key nodes of an event within a limited time, and are more likely to strike a balance between the depth of information and viewing efficiency, thus meeting the users' need for complete access to information. In addition, compared with long videos that require higher technical conditions, medium-length videos are more likely to balance high-definition image quality and smooth playback, so that even if users choose to multiply the speed of playback, they will still be able to access the video content in its entirety, thus guaranteeing an immersive viewing experience.

4.2.3.Type of socio-technical synergy

The socio-technical synergistic configuration emphasises the role of both technical and social conditions in urban short video communication. In this study, it corresponds to group 3. In group 3, ~content duration and ~presentation form are the core conditions of the group, while emotional tendency and content duration appear as marginal conditions in the group, which reveals the deep coupling of social and technical systems in urban short video communication. It has been suggested that short videos with a duration of about 57 seconds can maximise the communication effect [15], which provides empirical guidance for optimising the communication effect of short videos. However, the sample data in this paper show that when video duration forms a synergistic effect with elements such as narrative strategy, communication effectiveness can still be maximised even if the conventional optimal playback duration framework is broken. For example, in the video '' The ambience of Xiamen's roundabout ' #Xiamen sunrise' by @Amoy Yu, the creator captured Xiamen's seaside landscape in a more relaxed way, paired with an emotionally evocative soundtrack, and guided by the hashtag #XiamenSunrise, the video triggered audiences' yearning for the city of Xiamen in a micro-narrative that lasted only 6 seconds. Xiamen's sunrise hashtag triggered the audience's longing for the city in a 6-second mini narrative.

4.3.Robustness test

In order to circumvent the influence of chance factors and ensure the stability of the results of the histogram analysis, this study chooses the method of increasing the consistency threshold to test the robustness of the results. In this study, the consistency threshold was raised from 0.75 to 0.8, and other parameters remained unchanged, and it was found that the group configuration

of urban short video dissemination effects did not change substantially, and the coverage and consistency levels of the four groupings and the overall solution were not significantly different. Therefore, it can be considered that the results of the group state analysis in this study have a certain degree of robustness and reliability.

5.Research Conclusion

Under the background of iterative upgrading of mobile communication technology and intelligent evolution of terminal equipment, short video has rapidly emerged as an emerging media form. The short video platform has evolved from an entertainment tool to a social communication matrix, and its functional boundaries are constantly expanding, gradually building a composite service platform integrating social interaction, knowledge dissemination and consumption guidance. This media form has deeply intervened in the user's living space through scene penetration mechanism, which not only reconstructed the underlying logic of information production and dissemination, but also reshaped the cognitive schema of contemporary society. In this transformation, urban cultural tourism communication is moving from 'resource-driven' to 'communication -driven'. This study identifies city samples based on the 'New Beijing News Top 30 Red Cities (2025)', searches the Jitterbug platform with city as the keyword, and selects the short videos with the top 4 likes in descending order of hotness, finally forming a case database containing 120 samples; on the basis of existing fruitful research results, we rely on the theory of socio-technical systems to set the content theme, emotional tendency, topic guidance, title length, content duration and presentation form, and other pre-topic and pre-title characteristics, Based on the fruitful research results, we set antecedent variables such as content theme, emotional tendency, topic guidance, title length, content duration and presentation form, and explored the grouping paths of the communication effect of urban short videos by using the method of fuzzy set stereotyping and comparative analysis.

It is found that there are four typical combinations of conditions that lead to high dissemination effects of urban short videos, which are further summarised into three types of configurations, namely, socially dominant, technologically dominant and socio-technologically synergistic. These three configurations help to explore the efficient dissemination mechanism of urban short videos in depth. In the socially dominant grouping, positive emotional tendency is the core condition for the efficient dissemination of urban short videos; in the technologically dominant grouping, regardless of the theme and type of urban short videos, when the video length is of medium duration, the short video can obtain better dissemination effects; in the socio-technological synergistic grouping, the emotional tendency and the duration of the content appear in the grouping at the same time as the marginal conditions, which reveal that the social subsystems in the dissemination of urban short videos are not only the same, but also the same. the coupling mechanism of social and technical subsystems in urban short video dissemination.

References

[1]Trist E.L., Bamforth K.W. Some social and psychological consequences of the long wall method of coal-getting: An examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system [J]. Human Relations, 1951, 4(1): 3-38.

[2]Liu J.S. Research on combined influencing factors of urban short video communication effects [D]. Southwest University, 2024.

[3]Wang Y.Q. Analysis of urban image communication effects and influencing factors: A case study of Chongqing city image videos on YouTube [J]. Media, 2024, (23): 59-61.

[4]Ragin C.C. Fuzzy-Set Social Science [M]. Chicago: University of Chicago Press, 2000: 370.

[5]Pappas I.O., Woodside A.G. Fuzzy-set qualitative comparative analysis (fsQCA): Guidelines for research practice in information systems and marketing [J]. International Journal of Information Management, 2021, 58: 102310.

[6]Ragin C.C. Redesigning Social Inquiry: Fuzzy Sets and Beyond [M]. Chicago: University of Chicago Press, 2008: 104.

[7]Kaur W., Balakrishnan V., Rana O., et al. Liking, sharing, commenting and reacting on Facebook: User behaviors' impact on sentiment intensity [J]. Telematics and Informatics, 2019, 39: 25-36.

[8]Qingbo Index. Douyin account communication power index DCI (V1.0) [EB/OL]. (2021-01-05).

[9]Luan Y.M., Su Y. "Hot presentation" and "cold concealment": The image of "agriculture, rural areas and farmers" in short videos of China's new era [J]. Editors' Friend, 2019, (10): 38-48.

[10]Fu P.H., et al. Modeling network public opinion propagation with the consideration of individual emotions [J]. International Journal of Environmental Research and Public Health, 2020, 17(18): 6681.

[11]Martín, E. G., Lavesson, N., & Doroud, M. Hashtags and followers: An experimental study of the online social network Twitter [J]. Social Network Analysis and Mining, 2016, 6: 1-15.

[12]Yang, D. S., Li, S. X., & Cong, Y. N. Research on factors influencing the communication effect of Douyin reading promotion short videos [J]. Library Science Research, 2021, (23): 34-44.

[13]Ding, M., Zhang, T. L., & Luo, J. Short video user ecology and demand evolution: Research report on short video user value (2020) [J]. News and Writing, 2021, (02): 52-59.

[14]Wu, Y., et al. The relationship between social short-form videos and youth's well-being: It depends on usage types and content categories [J]. Psychology of Popular Media, 2021, 10(4): 467.

[15]Chu, X. Research on the identification of fair use of short video copyright [D]. Anhui University of Finance and Economics, 2022.

Author Bio：Zhaoyu lu (born December 1997), male; Han Chinese; hometown: Anyang, Henan; educational level: bachelor's degree; research direction: media economics and management.