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A Comprehensive Evaluation Method for Short Video Marketing Communication Effectiveness of Chinese Rural Enterprises Based on Big Data Technology

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Abstract

This paper studies about rural enterprises in China have become an important development trend in the short video market in recent years. Short videos related to rural cuisine have become one of the popular fields in the context of rural revitalization strategy. Promoting the construction and dissemination of rural culture is the "soul casting" of rural life and an important part of achieving the strategy of rural revitalization. Under the empowerment of short videos, the dissemination of rural corporate culture has shifted from passive "shaping" to active output. This has injected new vitality into the cultural life of rural people. This article provides valuable thinking and reference for the development of rural short videos by analyzing the communication strategies and effects of rural corporate culture. This also brings inspiration to other short video self media people. This paper studies the short video transmission based on cybernetics. Based on the data processing of representative social platforms on Weibo, the implementation of short video communication marketing was analyzed. Based on the critical point theory, a short video propagation tree model was constructed. In addition, based on the characteristics of Weibo communication, we selected quantitative indicators to determine the marketing effectiveness of enterprise Weibo and obtained a micro matrix structure. A quantitative model evaluation was conducted on the synergistic effect between enterprise Weibo accounts using a propagation tree model. Finally,

it is concluded that even if there are many fans and forwarding volumes, the difference between microblogs and short videos will directly affect their intrinsic value.

Keywords: Cybernetics, Weibo Marketing, Short Video Dissemination, Chinese Rural Enterprises

Introduction

In the era of traditional media, the dissemination of rural culture has always relied on the one-way output of radio and television media. The audience's understanding of rural culture is limited to the unified shaping of the media. As rural cultural producers, rural residents lack channels and conditions for self cultivation, and are in a state of aphasia. With the continuous development of new media social platforms, farmers have gradually awakened their sense of subjectivity and started to try to express themselves and gain identity through new media. The shooting and publishing of short videos is simple and easy to learn, with weak technical skills, and is not limited to cultural level and age. It can be easily mastered to maximize the initiative of creators. This has greatly stimulated the creative productivity of the farmers who were originally at a disadvantage in terms of communication discourse, becoming builders and disseminators of rural culture. The disseminators of rural culture have expanded from the media to individuals, and the content and perspective of dissemination have also changed. Previously, the rural images portrayed by traditional media were often described from a macro and meso perspective, starting from the overall perspective; In the field of short videos, creators can create rural cultural works that are highly personal and close to life based on their own characteristics. Li Ziqi gained a large number of fans by showcasing his leisurely rural life and his warm daily interactions with his mother-inlaw. And the exquisite video production showcases the charm of traditional Chinese culture and rural natural scenery, allowing Chinese rural culture to go global, attracting many overseas fans, and enhancing the global influence of Chinese rural culture. Under the empowerment of technology, the farmer community has fully unleashed the subjectivity of farmers' creators. While sharing their personal lives through short video platforms, they have also spread local and unique folk cultures, bringing new vitality to rural culture and enhancing the cultural confidence of Chinese people.

The role of the internet in business development cannot be ignored now. With its combination of social media and mobile internet platforms, short videos can enable enterprises to directly face end users and convey their brand value information. In this situation, Weibo short videos have become a very typical form of social marketing, and it has become a new field (Liu & He, 2020). For the Weibo marketing process, many companies have chosen to organize micro matrix accounts (Zhou et al., 2013). As the name suggests, a micro matrix is a Weibo matrix. It belongs to the enterprise owned Weibo and plays a crucial strategic role in the social marketing process (Dong et al., 2015). Formally, construct corresponding short videos based on the differentiated positioning needs of products, brands, and functions. Essentially, accurately connecting all types of users with various accounts is a short video marketing strategy chosen by enterprises(Korcsmáros & Šimova, 2018). According to practice, enterprises have a certain understanding of Weibo short video marketing. But the

understanding of its essence is somewhat unconventional. It is usually only seen as a channel for conveying information to the outside world without carefully considering the content. It is impossible to maintain corresponding interaction with consumers, and naturally it is also impossible to be closely linked to the operation of enterprises (Lica et al., 2020). Even on Sina, the number of companies registered on official Weibo is relatively high, but most of them are in the exploration period. According to the Weibo rankings released by Sina Weibo, the vast majority of companies with high rankings are closely related to the internet. Many traditional enterprises' official WeChat accounts are still in the early stages of exploration (Kotler et al., 2006). In this case, we will explore and analyze the dissemination patterns of Weibo short videos, clarify the marketing strategies of Weibo short videos, and define their effects, which will provide effective assistance for the operational capabilities of Weibo (Gao, 2021).

Related Work

In rural culture, the audience's impression has always remained within the inherent image created by traditional media. Especially young urban residents who lack understanding of it are more likely to develop stereotypes. Through the dissemination of short video platforms, the audience can gain a deeper understanding of rural culture from various perspectives such as farmers' daily life, labor, and interpersonal communication. And users of short video platforms are no longer subject to geographical restrictions. Not only urban users, but also rural netizens can see the living conditions of rural residents in different regions through the internet. This type of short video is more likely to generate emotional resonance among rural users. Based on strong interpersonal communication, rural self media can establish a more stable fan base. At present, the dissemination mode of user generated content (UGC) in rural short videos on such short video platforms can greatly unleash the creative vitality of rural people. Enhance farmers' participation in the dissemination of rural culture and promote the diversified display of rural image. At the same time, the social attributes of short video platforms also allow creators to receive user feedback in the first place. And able to communicate and communicate with users in a timely manner through the platform. This not only allows communicators to adjust content in a timely manner based on audience preferences. It can also strengthen the dialogue between rural and urban areas, promote the integration of urban and rural cultures, and strengthen the recognition of rural culture. On the other hand, the strong link attribute of short videos endows them with super strong diffusion and dissemination capabilities. The interconnectivity between platforms enables short videos to achieve fission propagation across major internet platforms in a very short amount of time, greatly improving the speed and scope of dissemination, and expanding the influence of the content being disseminated. The 'short, flat and fast' attributes of short videos further enhance their dissemination advantages. The intelligent recommendation of big data and algorithms can also achieve precise positioning based on user preferences, improving the effectiveness of dissemination.

Based on the summary of relevant literature on Weibo short videos, the specific research on Weibo short videos at home and abroad can be divided into three aspects: firstly, sociology at the social network level. The second is the physics at the complex network level. The third is the level of communication (Hillig, 2016). The research in this field exhibits comprehensive and comprehensive characteristics. The exploration of disseminators and media is relatively deep (Fan et al., 2016). The fan economy has been on the rise for a long time in the past,

manifested in the value of information dissemination. This also led to the emergence of the concept of social media (Nikunen et al., 2017). Sociology and social relations are closely related. One of the main research areas is to explore the relationship between static attributes and groups. It involves more content, and a more complex network perspective relies on the rational use and evolution of mathematical models to obtain simulated environments. It can help improve the upgrading of Weibo short video structure and the prediction of information dissemination channels. Communication studies focus on the media role of Weibo itself. This article provides a detailed introduction to the social value of Weibo short videos and their impact on the media industry. Based solely on the impact of Weibo short videos on its own situation, it is not comprehensive enough and cannot be seen as a starting point because it is related to commercial value operations.

Methodology

A Micro Matrix Based Evaluation Model for Short Video Marketing in Enterprises The emergence of short videos has provided an effective way for rural communication. But whether it is a platform or a creator, their communication purpose is not simply to promote rural culture. The competition among major internet platforms has become increasingly fierce with the continuous development of media. Platforms often overlook their social responsibilities and blindly pursue economic benefits in order to attract attention and gather traffic. In the endless variety of self media, creators must also continue to output content in order to maintain their popularity. In the high-speed competition for benefits, content has become a victim, and creators only focus on attracting traffic with humorous videos. However, they neglected to explore the depth and characteristics of rural culture, resulting in serious homogenization of rural short videos and a lack of practical significance in the dissemination of content. Both creators and platforms find it difficult to uphold the role of disseminators in the pursuit of interests, which also hinders the sustainable development of rural cultural dissemination. Although the rise of short videos has provided opportunities for rural cultural dissemination, the improvement of media access rights in the new media era has also intensified competition in the field of short videos. The fragmentation reading style has distracted the audience's attention, and rural theme works want to emerge from many short videos. To achieve good communication results, it is necessary to find one's own positioning and highlight one's own characteristics. Through precise positioning, targeted promotion can be carried out to the audience group, accumulating fans and forming their own unique P. Spreading rural culture as a brand can not only deepen the audience's memory points, but also enhance the influence of cultural dissemination through brand effects.

In the analysis of the Weibo short video dissemination environment, we chose a typical social network analysis method to construct the model. The short video independent account on Weibo is regarded as a node, and mutual care is lateral. To construct a network diagram that meets practical needs. According to the figure below, this is a social network established by a company with relatively multiple sub accounts. Considering privacy, all accounts are represented by numbers. It can be understood that this is a more important issue, as any sub account of a short video enterprise exists around its own aggregation. The core parameters of the social network analysis model are degree and its distribution, average path length, etc. Degree and Degree distribution: the degree of any short video node belongs to the number of links in the node. This is the technology of this node domain. It can be said that the distribution of degrees belongs to the basic characteristics of networks. The network Degree

distribution is an introduction to the relative frequency of each degree containing nodes. Path length of nodes: the distance between two nodes belongs to the length of the shortest path or geodesic line between them. If two nodes do not have a path, the distance must be infinite. The diameter of a short video network is the maximum distance that can exist between nodes. Aggregation coefficient: It can be understood that the social network structure of Weibo short videos exhibits group characteristics. The concentration of these groups is described as the condensation coefficient. Generally speaking, there are two methods that can be applied to the calculation of concentration coefficients. The first is to introduce the global convergence coefficient of the overall network concentration ratio. The second method is to treat a single node as the target and add the measurement and short video tightness of adjacent nodes to the group. The calculation method of global aggregation coefficient is based on the proportion of closed triangles. Assuming that small groups are usually associated with three nodes, 22. Based on this, a closed triangle was generated. The global convergence coefficient can be obtained by the following formula:

$$C = \frac{3 \times numberof\ triangles}{numberof\ connectedtriplesof\ vertices\ numberof\ closedtriplets} = \frac{}{numberof\ connectedtriplesof\ vertices} \quad (1)$$

G= (V, E) represents the network structure by using the node set V and the node relationship E as the edge. e_{ij} represents the side that is connected to the node between the node i and the J. $N_i = \{V_j : e_{ij} \in E \cup e_{ij} \in E\}$ is defined as a i neighbor of V_i. k_i represents the number of V_i neighbors. It can be found that the global agglomeration coefficient is the average index of the local agglomeration coefficient of each node:

$$\in = \frac{1}{n} \sum_{i=1}^{n} C_i \quad (2)$$

The role of a person in the social network structure is specifically the display of the central performance. According to the classification of connection statistics, central indicators can be divided into the following categories: node connection is formed; node delivery is difficult or not; and the key to node connection with other nodes is mediated. Therefore, centrality can be divided into three categories: degree centrality, close centrality and intermediary centrality, respectively. Degree centrality is defined by the centrality of a certain node in the group by virtue of the quantity of relations. This also represents the more the number of friends a person exists, and the more it can be shown in the social network. Dunbar, a Oxford scholar, has found that 150 people are the most stable social networks that can be maintained by human cognitive ability. Only this theory is expressed as a two-way communication. The one - way concern in micro-blog network is much more than that. In addition, the neutrality of group degree can be expressed as a whole. The average value of the degree difference

between the corresponding nodes and the maximum degree central node is calculated. In the face of higher degree center potential, the balance of the corresponding nodes in the group is worse. Most of the power is in the hands of some people. The spread of information is usually like a tree. The source of information is diverged along the way. Thus, as shown in Figure 1, a schematic map of the information propagation tree which involves more content is constructed, which is represented by G= (V, E). In this, V indicates that information is passed to each user node. E represents the micro-blog forwarding path aggregation. From the picture we can see, it showed a strong complexity of micro-blog. E1 indicates that V1 forwarded V0's micro-blog. E2 represents the self - forwarding behavior of V1. E3 and E7 indicate that V3 forwards each micro-blog from V1 and V2. The two aspects of the retransmit relay from V4 and V5 respectively. In the end, the microblog was exposed to two times in V6 with the V4 and V5 forwarding.

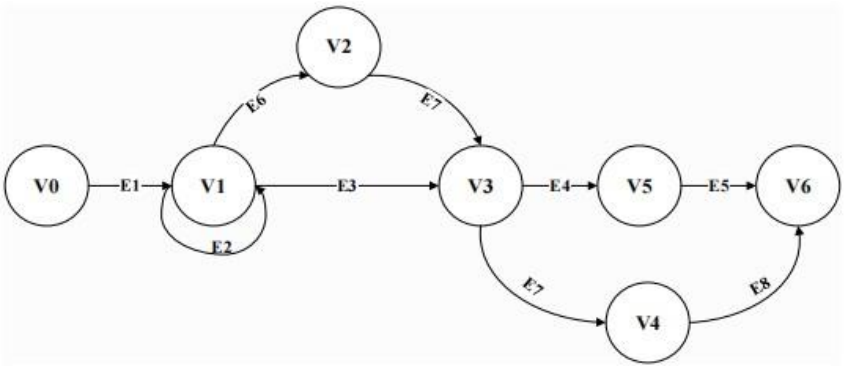

Figure 1 a schematic diagram of the micro-blog propagation tree model

Evaluation model of N dimensional micromatrix propagation value

We should not only analyze the essence of the problem by means of the meaning of sociological research, but also need to take more complicated network discipline tools to quantify the cost and return models. Finally, it must be transferred to the social value of communication science. This also belongs to the important purpose of the research project proposed in this paper. The purpose is to connect with the specific circumstances of microblog's operation, and build a corresponding model by quantitative way to explore the impact and utility of micro-blog impact. In connection with practice, micro-blog in micromatrixes is generally promoted to communicate with each other. As shown in figure 2.

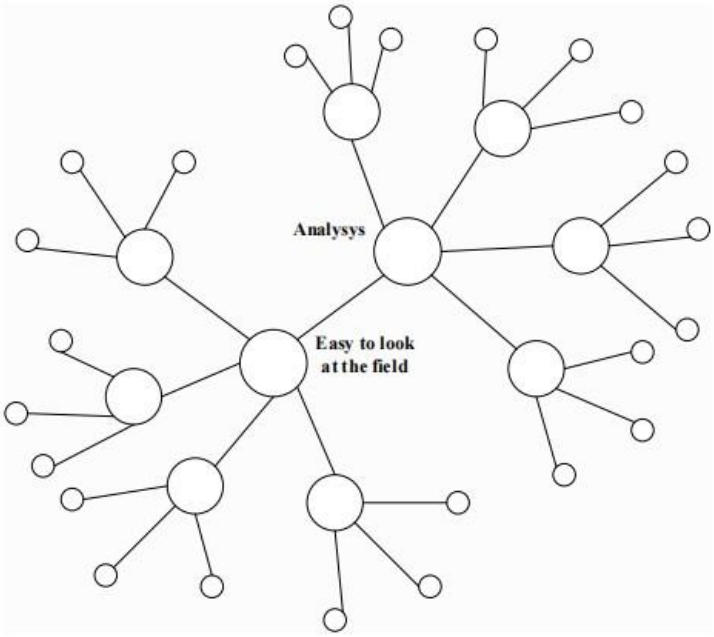

Figure 2 Schematic diagram of micromatrix structure for Hub enterprise

The connection result matrix can be found that the diagonal line is the self forward diffusion coefficient of enterprise micro-blog. The latter is the diffusion influence coefficient of each member in the micromatrix. For enterprise micro-blog marketing, the results of model and data analysis algorithm are more remarkable. To a certain extent, it can help enterprises to make effective decisions and scientifically judge the effectiveness of the operation. Using this propagation model, the enterprise can get the mode of communication which is in line with its own characteristics. It can be applied in a matched audience with its limited operating resources. The focus of our subsequent work is to examine the practicality of the model and the operating status of micro-blog in combination with empirical data.

In view of the solution of this model, we choose the crawler program BFS algorithm. This algorithm is the breadth finite search algorithm. This is an important algorithm prototype in computer graph theory. The tree graph is scanned by the method of stratification. In the actual application scene, it satisfies the constitution of the man-machine network. A good friend grabs it, and then is a friend's friend, which extends in accordance with this rule. The specific principle is: the known graph G= (V, E) and the root node m. This algorithm relies on a scientific approach to the graph G nodes and edges. The first is to find all the subnodes that can be passed through the m point. The corresponding numbering is implemented in order and applied to the queue. Search for its nodes and edges. Then the numbered node, n is the first in the queue and eliminated. Then explore all the subnodes that can be entered. The number of combination number is applied to the queue and carried out in reciprocation. The operation of this type of micro-blog shows a broad, and deep path feature, which can achieve great efficiency. For space complexity, since all nodes need to be stored, the BFS space complexity is 0 (|V|+|E|). This |V| belongs to the number of nodes. And |E| belongs to the number of edges in the graph. The practical application scope of this article is a large amount of space-oriented demand. Therefore, we must rely on MapReduce to develop the Hadoop technology to implement the BFS algorithm. When the time complexity is the lowest, the BFS needs to

search the path to all possible nodes. So, the time complexity is 0 (|V|+|E|). Here |V| is the number of nodes. And |E| is the number of edges in the graph.

Result Analysis and Discussion

In the 4G era, with the continuous downward movement of new media usage technology, the media productivity of rural people has been greatly improved, allowing farmers to enrich their lives through various social media apps in their spare time. Cultural communication works are also mainly focused on videos. With the gradual commercialization of 5G technology, it has brought more possibilities for dissemination. Rural builders can not only communicate with the audience in real-time through high-definition live streaming to promote the culture and characteristics of their hometown, but also drive the economic development of rural areas through sales. The emergence of 5G also provides the necessary technical foundation for immersive communication. Rural narrative relies more on the construction of distinctive rural landscapes, and the further application of VR technology in the field of rural communication can break the limitations of time and space. By constructing highly simulated scenes, the audience can truly feel the unique folk customs and regional cultural charm of different regions. Showcasing the essence of rural culture through exquisite visual rhetoric and presence, providing the audience with an excellent experiential experience. In the 5G era, the ways of cultural dissemination also need to keep up with the times. Through continuous innovation in communication forms and content, the expressive power of rural culture can be enhanced, and the charm of rural culture can be demonstrated from multiple perspectives through more intuitive, authentic, and natural experiences. The results of one dimensional model data derived from the pruning algorithm combined with SAS coding are as follows: this soureName field represents the core micro-blog account name. The del field indicates the elimination of a member account in a micromatrix. The wide field represents the breadth of the propagation. The deep field represents the depth of propagation. The tl-t9 field indicates the time that the propagation of the coverage of the 10%-90% needs to be consumed. The data in the table belongs to the corresponding microblog state average.

Table 1

Summary of data analysis results of micromatrix micromatrix in one dimension enterprise

sourceName	del	wide	dee ɔ	tl	t3	t5	tl	t9
Millet company	null	58858	6.86	13.68	64.63	86.16	123.48	301.14
	Millet company	46315	6.86	11,83	60,28	82.13	120.56	302.48
	Mi phones	45841	6.86	20.83	66.82	86.40	123.88	304.36
	MiTalk	58805	6.86	15.83	65.03	86.24	123.65	301.34
	Millet box	58862	6.86	13.68	64.64	86.18	123.50	301.20
	Null	58018	4.58	6.43	33.85	55.28	66.11	313.58

360 security guards	360 security guards	56888	4.33	6.43	33.86	55.28	66.11	313.58
	360 handset assistant	58018	4.58	6,43	33.85	55.28	66.11	313.58
	360 security desktop	58018	4.58	6.43	33.85	55.28	66.11	313.58
	360 user special machine	58018	4.58	6.43	33.85	55.28	66.11	313.58

Combined with the depth and breadth data at the macro level, we can know that the 25 micro-blogs of @MI, whose forwarding amount of average spread is 59959 people. The maximum propagation depth is up to 7.96 layers. If you want to spread 10% of the population, it will take 13.9 hours. And the population that wants to spread 50% will take about 5 days. It takes about 12.5 days to realize the spread of the 90% population. With SPSS data statistical processing, the @ MI micromatrix member depth - breadth - speed contribution rate is specific as Figure 3.

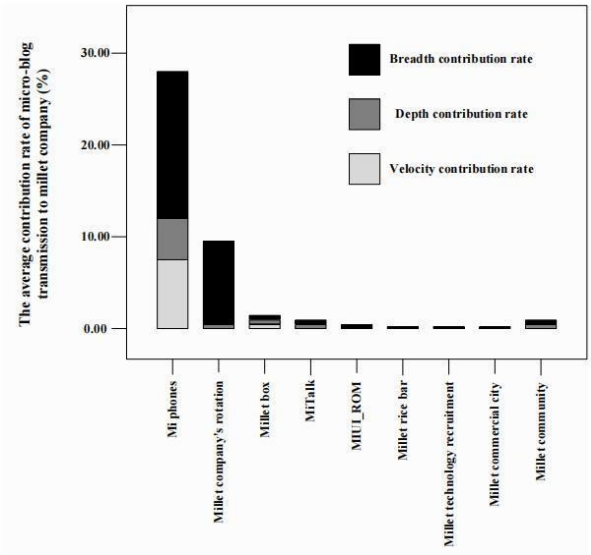

Figure 3 contribution rate of micromatrix members to millet company micro-blog transmission

The @360 security guard micromatrix member depth - breadth - speed contribution rate is shown in Figure 4.

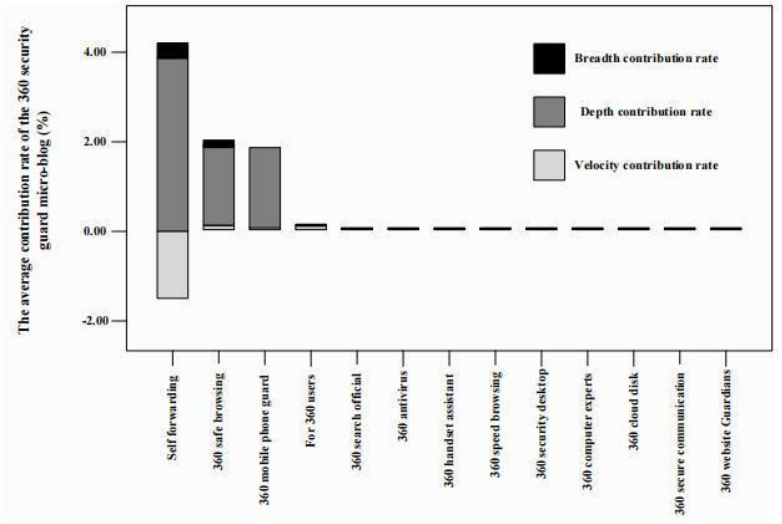

Figure 4 contribution rate of each micromatrix member to the 360 security guard micro-blog propagation

Combined with the above picture, we can understand that the micromatrix members of the millet company can effectively promote the promotion of its spread. In addition to MI company, MIUI mobile phone, MIUI box and MIUI chat have played a role in the top three. MIUI mobile phone is in the first place. The three levels of depth, breadth and speed have their respective ratios of 2.83%, 15.22% and 7.98%. This will be able to learn that the MIUI mobile phone for micro-blog's contribution to the transmission of millet is particularly critical. Look at the 360 security guard enterprise micro-blog, which shows the form of a micromatrix. It just did not show a corresponding synergy. This is the aspect that it can improve and optimize. In terms of the micro time process, we choose the micro matrix members of MIUI mobile phone, @ MIUImobile phone, @ MIUI box and @ Mi chat to change the contribution value in the time dimension. As shown in Figure 5.

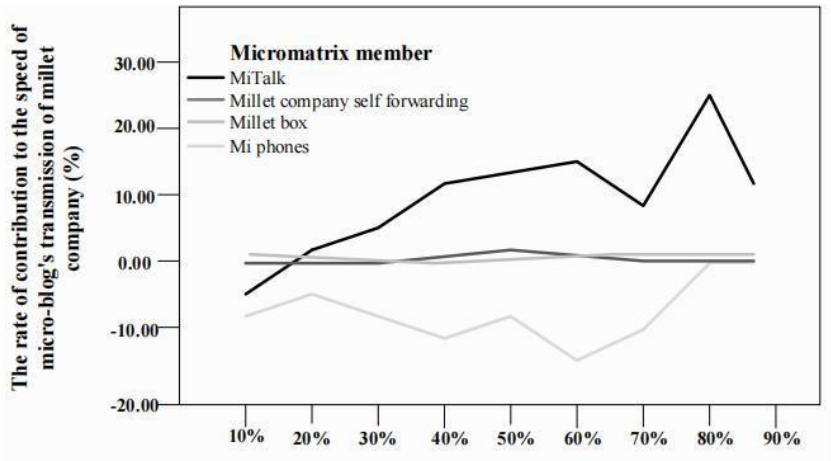

Figure 5 contribution rate of micromatrix members to the propagation speed of millet company micro-blog at each stage

Combined with figure 5, we can learn: @MIUI mobile phone is in the actual contribution rate of the @ MIUI company information dissemination process. In particular, the mid period

of communication after 30% of the total transmission rate, @ MIUImobile phones effectively promoted the promotion of the micro-blog transmission speed of @ MIUIcompany. And in the later period of the period of 70% to 80% of the total transmission, it can play a significant role in promoting. It is also shown that the contribution of the other two micromatrix members to the propagation rate is not significant. It is important to note that, with the results of statistics, there is a certain probability that the self - forwarding of enterprise microblog will increase the breadth of the spread. It is only combined with the results of the validation to understand that it does not make the speed of transmission faster. As far as the average propagation dimension is concerned, the synergistic effect of micromatrix is not significant. We must be based on the micro level to analyze the communication process at the corresponding stage and the impact of the micromatrix members on the speed of microblog transmission. Generally speaking, based on the three dimensions of depth, breadth and speed, we can know that there is a very significant mutual promotion effect on the micro matrix members of MIUIcompany. In particular, @MIUI Mobile 'has played a more significant role in promoting the @ MIUI box' to both the depth and breadth level. It is a hub micromatrix structure. The type of transmission is more similar to the dandelion type which is detonated by the node. In comparison, the role of the micromatrix members of the 360 companies is not significant. The distributed micromatrix structure focuses on the influence of the account itself and the central spread of the content in the type of propagation. For the diagonal region of the matrix, that is, the contribution of micro-blog's self propagation propagation, we can know that it can play a driving role in the depth and breadth of propagation. It does not have a great impact on speed. The results agree with the results of the micromatrix evaluation model. Finally, although the synergism between the 360 security guards' micromatrix members is low, the total micro-blog forwarding amount is relatively large. And some of these micro-blog forwards are particularly prominent. This study on behalf of corporate micro-blog communication rules must also be carried out in depth on other levels, like content of content, composition of fans, and so on. But it is also necessary to believe that 360 companies can focus on micromatrix marketing synergies in order to strengthen the effectiveness of micro-blog marketing.

Conclusions

Combining sociology, complex network analysis, and communication studies, the brand communication of short video marketing was analyzed. At the beginning, several common Weibo communication trees were summarized. It can be found that the influence of core nodes plays a crucial role in the detonation and classification of propagation trees. Then use a short video propagation utility measurement model. Choosing the "depth and speed" of Weibo as the measurement standard, a pruning algorithm for achieving systematic thinking and language has been developed. Finally, the specific practicality of the model was tested using data from MIUI Company and 360 Security as examples. Through the analysis of user attributes and relational data sets, it is proved that Sina Weibo short videos have the characteristics of Degree distribution, low node distance, and high aggregation coefficient. It has representative network domains and complex network features without scale, which has a positive effect on promoting information dissemination. In addition, the intrinsic value of enterprise short videos, in addition to the number of fans, also has a huge impact on the business model of enterprises.The online interaction mechanism of short video marketing is

reflected in the interactive module. After watching the short video, users will go to the comment section for consultation. Through this process, users can get a lot of information about the product, and enterprises can also get users' questions and feedback. Secondly, the interactive mechanism can also be reflected through short video explanation. After short video marketing of products, the enterprise can get users' questions and feedback, but the first round of text communication may not meet users' needs. At this time, the enterprise can launch video explanation to let users have a deep understanding of the product through visual and auditory communication.

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