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Research on the Optimization Strategy of International Communication of Micro Short Drama Based on Bayesian Networks

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ABSTRACT

As an emerging form of cultural communication, microshort dramas have emerged in the audiovisual industry. In order to explore the optimization method of international communication of short micro-dramas, this paper takes the selected short micro-dramas of an international video platform as samples, selects the influencing factors of the international communication effect of short micro-dramas, constructs the optimization model of international communication of short micro-dramas by using Bayesian network, and adopts the Great Likelihood Estimation Algorithm as its parameter learning method. The performance of the Bayesian network model is explored through model comparison, node sensitivity analysis and scenario simulation. The results show that the Bayesian network model has good prediction performance, and its AUC value is greater than 0.8 in both training and testing results. The entropy reduction percentages of publisher's fan number, video duration and localized creation are all greater than 0.07%, which have the most obvious influence on the effect of international dissemination of microshort dramas. Scenario simulation verifies the influence of each variable on the optimization of the international dissemination effect of micro-short dramas, and the probability value of the obtained optimal solution with a strong dissemination effect is 83.5%. It is recommended to actively guide the creation of high-quality products, carry out in-depth localized creation, accelerate the integration of art and technology, and strengthen the comprehensive governance of the industry, so as to promote the global dissemination of China's online micro short dramas.

Keywords: bayesian networks, great likelihood estimation, node sensitivity analysis, scenario simulation, international dissemination of microshorts

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1. Introduction

Before it was included in the scope of regulation, it was called "short drama" by iQiyi, "short drama" by Youku, "hot pot drama" by Tencent, and some called it "short video of account sharing" and "vertical screen drama" [1-3]. Micro short drama refers to the network film and television drama single episode less than 10 minutes in length of the episodic works, following the network film and television drama, network film, network animation after the fourth officially recognized network film and television work form [4-5]. 2020, the State Administration of Radio and Television key network film and television drama information filing system in the network drama, network film, network animation in addition to the three categories, the addition of a fourth “Micro short drama” category. And micro short drama in the process of development in addition to entertainment applications, in the play also presents a variety of culture, knowledge, traditional customs, and get many netizens' recommendations, which indicates that as a new content of film and television network micro short drama in the official level has been unified in stages, but also indicates that the network micro short drama through the development of cognition and influence has been developed to a certain extent [6-8]. The development of micro short drama is in the stage of rapid development, but because of its low input cost, short production cycle, low threshold of entry and other characteristics, it also leads to the production of a large number of micro short drama but very few quality works, there are a large number of problems such as confusing logic, pompous plots, hard script walks, and a large number of the development of the same kind of subject matter leads to a serious homogenization of the micro short drama, which is easy to make the user aesthetic fatigue, and it is also difficult to achieve the “broken circle” [9-11]. Platforms, producers, producers, and actors pay more attention to the heat and topicality of the works. However, the quality of the works is where the core competitiveness of micro short plays lies, which seriously hinders the international dissemination of micro short plays [12-13]. How to strike a balance between artistic value and market demand, and promote the internationalization and dissemination of short dramas is an urgent problem for micro short drama practitioners.

On the basis of analyzing the challenges of international dissemination of micro-short dramas, this paper takes selected micro-short dramas of an international video platform as the sample source, and determines the measurement indexes of the dissemination effect of micro-short dramas and the influencing factors of the dissemination effect from the three dimensions of the transmitter characteristics, the content characteristics, and the presentation mode. Then with the help of Bayesian network tools, K2 algorithm and great likelihood estimation are used to learn the network structure and parameters respectively. A comparative analysis of Bayesian network models, decision trees and neural networks is conducted to explore the performance of Bayesian network models through the discussion of the results of ROC curves and correct rates. Subsequently, the size of the influence of each node on the international dissemination effect of the micro-short drama is derived through node sensitivity analysis, and the optimal scheme for simulating the theoretical international dissemination effect of the micro-short drama is simulated through model inference. Finally, according to the analysis results, the optimization strategy of international dissemination of micro short drama is proposed.

2. Challenges of international dissemination of microshorts

As a new species born in the mobile network media environment, micro short drama, an audiovisual medium that combines the light weight of “micro short” and the strong narrative of “drama”, has strongly “invaded” the ecosystem of the film and television industry, and has rapidly opened up the situation in overseas markets. This audio-visual medium, which is characterized by both “micro-short” lightweight and “drama” strong narrative, has strongly “invaded” the ecosystem of the film and television industry, and has rapidly opened up the situation in overseas markets. China's online micro-

dramas have received attention and recognition from international audiences, but they also face certain problems.

2.1. Content is still poor

The content of Chinese short micro-dramas going to sea is still relatively monotonous on the whole, and generally meets the challenges of "low quality" and "homogeneity". The creation mode of Chinese short micro-drama is relatively fixed, and the narrative mode adopted by mainstream overseas works is relatively similar. At present, the copyright holders of micro short drama IPs are mostly transformed by online literature organizations, and the producers are mainly information flow content production organizations, which show problems such as single expression of cultural connotation and values, weak logic, lack of realism and humanistic concern.

2.2. Regulatory mechanisms and cultural differences

Micro short dramas face differences in regulatory policies across countries when going overseas, and need to overcome the obstacles to distribution caused by "cultural discounts". Although cultural premium can stimulate audiences' interest in heterogeneous cultures, microshorts need to make efforts in content innovation and cultural inclusiveness in order to cope with the needs and cultural challenges of different markets.

In addition, as some countries gradually tighten their control over platform algorithms and content recommendations, the overseas promotion of micro dramas is also subject to tighter compliance constraints. At the cultural level, Chinese micro short dramas may encounter cultural discounts when they are disseminated in different cultural contexts, i.e., cultural content originating from China may be difficult to be fully understood or accepted in different cultural environments due to differences in language, values, and customs.

2.3. Copyright protection issues

Due to the special characteristics of online communication, online micro drama faces certain challenges in copyright protection, and its copyright is vulnerable to piracy and infringement, which not only weakens the legal status of online micro drama in the international market, but also adversely affects its long-term development and sustainability. First of all, at the level of content creation, the phenomenon of mutual plagiarism and melting of stems occurs from time to time. This has led to a decrease in original content and a decrease in the innovation capacity of the whole industry. Secondly, the vicious competition among peers has caused many short dramas that are not authorized in China to be panned abroad, and the rights and interests of the filmmakers cannot be effectively protected.

3. Optimization analysis of the international dissemination of microshorts

In this chapter, we will take the selected micro-skit videos of an international platform as samples, and use Bayesian network to analyze how to make micro-skit achieve better international dissemination effect under the premise of guaranteeing the quality of information.

3.1. Bayesian network modeling

Bayesian networks, also known as belief networks or causal networks, are widely used in the field of artificial intelligence. Bayesian network is a probabilistic graphical model based on the principles of Bayes' theorem and graph theory, which models causality and uncertainty among variables by representing conditional probability distributions among variables. The model consists of two parts, the directed acyclic graph (DAG) and the conditional probability table (CPT), in which the directed acyclic graph refers to the structure of the network, which is a qualitative analysis of the Bayesian network, and consists of the set of points V representing random variables, the set of directed edges

E connecting the nodes, denoted $G =< V, E >$, where the nodes of the random variables can be categorized into three types, namely, the goal nodes, the intermediate nodes and the evidence nodes. The conditional probability table, i.e., the parameter learning part, is a quantitative analysis of the Bayesian network and is used to represent the strength of the connections between the nodes.

3.1.1. Structural learning. The core idea of Bayesian network structure learning is to select a network structure that best fits the logic of a given dataset and has the best fitting effect from multiple candidate Bayesian networks in the inference process by generating a sample set of data. The learning process of network structure learning algorithm based on scoring search is more simple and standardized, and in this paper, we use the classic algorithm based on scoring search: the K2 algorithm, to carry out the learning of model network structure.

K2 algorithm is one of the classic algorithms for Bayesian network structure learning based on scoring search, which is widely used by academics for its superior learning performance. The specific calculation process is as follows:

1) Define the scoring function.The K2 algorithm uses CH scoring, i.e., a posteriori probability $P(G \mid D)$ as the scoring criterion, for the specified two Bayesian network structures N_1, N_2:

$$\frac{P(N_1 \mid D)}{P(N_2 \mid D)} = \frac{P(N_1, D) / P(D)}{P(N_2, D) / P(D)} = \frac{P(N_1, D)}{P(N_2, D)} \tag{1}$$

Thus it is only necessary to compare $P(N_1, D)$ and $P(N_2, D)$. Further let the range of values of $D = \{X_1, X_2, ..., X_n\}$, X_i be $\{x_{i1}, x_{i2}, ..., x_{r_i}\}, r_i \geq 2, i = 1, ..., n$ and G denote the network structure on D, then:

$$\begin{aligned} P(G, D) &= P(G)P(D \mid G) \\ &= P(G)\prod_{i=1}^{N} p(x_i \mid G) \\ &= P(G)\prod_{i=1}^{n}\prod_{j=1}^{q_i}\frac{(r_i - 1)!}{(N_i + r_i - 1)!}\prod_{k=1}^{r_i} N_{ijk} \end{aligned} \tag{2}$$

2) Setting the search strategy: In order to reduce the search space and improve the learning efficiency, the K2 algorithm needs to provide two constraints, namely, node priority ρ and maximum parent node u. Node priority refers to the strict order of nodes, the node after the order must not be the parent of the node before the order, i.e., if there is an order $\rho = \{X_1, X_2, ..., X_i, ..., X_j, ...\}$, then X_j must not be the parent of X_i. The maximum number of parent nodes refers to the number of parent nodes a node can have in the network, the parent node refers to other nodes directly pointing to the node, the maximum number of parent nodes is too high will lead to an increase in the complexity of the model, too low will lead to insufficient model expression ability, therefore, the maximum number of parent nodes should be considered according to the perspective of the data, domain knowledge and so on.

3.1.2. Parameter learning. After completing the structural learning of the Bayesian network, in order to be able to help the next problem study, parameter learning is needed to get the conditional probability table corresponding to each node in the network. In this paper, we use the great likelihood estimation algorithm (MLE) for parameter learning of Bayesian networks. Great likelihood estimation is a widely used parameter estimation method that serves to estimate the parameter values that are most likely to produce these data given the observed data.

Consider first a Bayesian network consisting of a single random variable, and let the random variable X take two values: 0 and 1. At this point, the network has only one parameter, the probability that X takes either 0 or 1, denoted θ.

The conditional probability $P(D|\theta)$ for a given sample D is called the likelihood of θ, and the likelihood function $L(\theta|D)$ with respect to θ is obtained by letting θ vary in the given domain of definition. denoted:

$$L(\theta|D)=P(D|\theta) \tag{3}$$

The value of the parameter θ that maximizes the likelihood function $L(\theta|D)$ is called the maximum likelihood estimate MLE of the parameter, denoted:

$$\theta^{*}=\arg\sup_{\theta}L(\theta|D) \tag{4}$$

Extending the above reasoning to the multivariate case, assume that dataset D has n independently and identically distributed sample data $\mathrm{D}=(D_1,D_2,\cdots,D_i,\cdots,D_n)$, in which case the conditional probability of parameter θ corresponding to sample D_i can be expressed as:

$$P(\mathrm{D}|\theta)=\prod_{i=1}^{n}P(D_i|\theta) \tag{5}$$

At the same time, its likelihood function $L(\theta|\mathrm{D})=P(\mathrm{D}|\theta)$ can be obtained, and logarithmic likelihood function can be obtained by taking logarithms of it:

$$\log\prod_{i=1}^{n}P(D_i|\theta)=\sum_{i=1}^{n}\log P(D_i|\theta) \tag{6}$$

The MLE is essentially a calculation of the values of the parameters taken when the likelihood function takes its maximum value, i.e., the calculation:

$$\arg_{\theta}\max\sum_{i=1}^{n}\log P(D_i|\theta) \tag{7}$$

The MLE is computed using different likelihood functions when the models are different. Consider a Bayesian network model consisting of n variables, denoted by X_i, whose subscripts take values in the range [1, n]. Assume that each node variable has r values and its parent node $\pi(X_i)$ has q combinations of values. If there is no parent node, then q = 1. At this point, the parameters of this Bayesian network can be expressed as:

$$\theta_{ijk}=P(X_i=k|\pi(X_i)=j) \tag{8}$$

The meaning of this is the value of the conditional probability parameter θ_{ijk} when X_i takes the value of k under the condition that the parent of the ith node X_i takes the value of j. Define the characteristic function $\chi(i,j,k,D_l)=1$ when sample D_l satisfies $X_i=k,\pi(X_i)=j$ and $\chi(i,j,k,D_i)=0$ otherwise. at this point the log-likelihood function of a node in the Bayesian network can be expressed as: $\log P(D_i|\theta)=\log\theta_{ijk}\chi(i,j,k,D_i)$, i. e. :

$$\log P(D_l|\theta)=\sum_{i=1}^{n}\sum_{j=1}^{q}\sum_{k=1}^{r}\chi(i,j,k,D_l)\log\theta_{ijk} \tag{9}$$

Then the log-likelihood function with respect to parameter θ of the whole Bayesian network is:

$$l(\theta|\mathrm{D})=\log\prod_{l=1}^{n}P(D_l|\theta)=\sum_{l=1}^{n}\log P(D_l|\theta) \tag{10}$$

Suppose there is a sample $D_1 : A = 1, B = 2, C = 1, D = 2$. numbering the values of the parent nodes according to the dictionary order shows that all values of $\theta_{111}, \theta_{212}, \theta_{311}, \theta_{432}$ are 1. The log-likelihood function is expanded as follows:

$$\begin{aligned} \log P(D_1 \mid \theta) &= \log(A = 0, B = 1, C = 0, D = 1 \mid \theta) \\ &= \log P(A = 0 \mid \theta) P(B = 1 \mid A = 0, \theta) \\ P(C = 0 \mid A = 0, \theta) &P(D = 1 \mid B = 1, C = 0, \theta) \\ &= \log \theta_{111} \theta_{212} \theta_{311} \theta_{432} \\ &= \sum_{i=1}^{4} \sum_{j=1}^{q} \sum_{k=1}^{2} \chi(i, j, k, D_1) \log \theta_{ijk} \end{aligned} \tag{11}$$

Define the number of samples in sample D_l that satisfy $X_i = k$ and $\pi(X_i) = j$ as m_{ijk}, denoted:

$$m_{ijk} = \sum_{l=1}^{m} \chi(i, j, k, D_l) \tag{12}$$

So there:

$$\begin{aligned} l(\theta \mid \mathrm{D}) &= \sum_{l=1}^{n} \log P(D_l \mid \theta) \\ &= \sum_{l=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{q} \sum_{k=1}^{r} \chi(i, j, k, D_i) \log \theta_{ijk} \\ &= \sum_{i=1}^{n} \sum_{j=1}^{q} \sum_{k=1}^{r} \sum_{l=1}^{n} \chi(i, j, k, D_l) \log \theta_{ijk} \\ &= \sum_{i=1}^{n} \sum_{j=1}^{q} \sum_{k=1}^{r} m_{ijk} \log \theta_{ijk} \end{aligned} \tag{13}$$

Because $\sum_{k=1}^{r} \theta_{ijk} = 1, \forall i, j$, when θ_{ijk} takes the following values:

$$\theta_{ijk}^{*} = \begin{cases} \dfrac{m_{ijk}}{\sum_{k=1}^{r} m_{ijk}} & \text{if } \sum_{k=1}^{r} m_{ijk} > 0 \\ \dfrac{1}{r} & \text{if no} \end{cases} \tag{14}$$

$l(\theta \mid \mathrm{D})$ obtains the maximum value, and θ_{ijk}^{*} in Eq. (14) is the maximum likelihood estimate for θ_{ijk}.

3.1.3. Network reasoning. Bayesian network inference refers to the fact that after structural and parameter learning, by setting new evidence on a node, it is possible to use the conditional probability table corresponding to each node in the network, and the logical relationship between network nodes to reason about the posterior probabilities of other network nodes.

There are two types of inference algorithms for Bayesian network models: exact and approximate algorithms. The commonly used exact algorithms are the multitree algorithm and the union tree algorithm, and the relatively most commonly used approximate algorithm is the random sampling algorithm, also known as the Monte Carlo algorithm. The difference between the two types of algorithms is that the exact algorithm can ensure the accuracy of Bayesian network inference, but only for relatively simple logic network structure, when encountered in the network nodes, complex logical

relationships, the use of the exact algorithm is out of place, so the approximate inference algorithms have been spawned, so that the network inference to ensure the efficiency of the same time to get a relatively optimal result.

3.2. Data collection

In this paper, 250 videos were randomly selected from selected micro-episodes of an international video platform as the video samples for this study. Quantitative data such as video plays, likes, comments, and publisher's followers were obtained through a web crawler tool, while qualitative data such as the content theme, cover type, screen format, and title sentence style of the videos were obtained by watching the videos and manually coding them.

3.3. Measurement of variables

3.3.1. Dependent Variable Measurement. Taking the dissemination effect of micro short plays as the dependent variable, the playback volume was set as the highest weight, accounting for 40%, while 15% weight was assigned to each of favorites, likes, comments and shares. Based on the distribution intervals of the standardized data, different levels of dissemination effect were classified, and the standardized data less than -0.5 was discretized as L (weak), greater than or equal to -0.5 and less than or equal to 0.5 was discretized as M (medium), and greater than 0.5 was discretized as H (strong).

3.3.2. Measurement of independent variables. In order to reduce subjective bias in the data collection process, this study arranged for three coders to conduct independent coding during the initial coding stage. The specific coding criteria can be seen in Table 1. The independent variables included three dimensions: transmitter characteristics, content characteristics, and presentation.

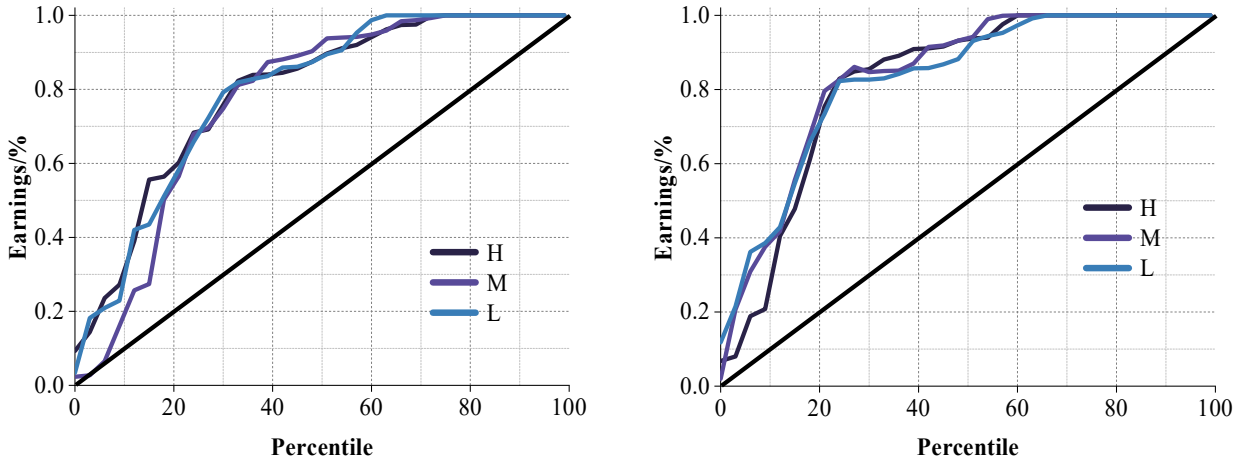
Table 1. Independent coding

Dimension	Variable name	Variable interpretation
Sender characteristics	Publisher fans	H(high),M(medium),L(low)
	Publisher type	G(personal authentication),J(institutional certification),N(no certification)
	Publisher's quantity	H(high),M(medium),L(low)
	Organizational form	D(independent contribution),L(joint contribution)
Content characteristics	Content theme	N(novelty),R(routines),S(special)
	Chinese cultural elements	Y(Yes),N(no)
	Localization	Y(Yes),N(no)
	Original	Y(Yes),N(no)
	Emotional color	S(significant),N(neutral)
Presentation mode	Title sentence	S(statement),E(exclamation),Q(question),I(imperative sentence)
	Cover type	T(text),P(picture),M(picture+ text)
	Background music	Y(Yes),N(no)
	Subtitles	Y(Yes),N(no)
	Screen form	H(horizontal screen),V(vertical screen)
	Video duration	S(within 5min),M(5-10min),L(10-30min),O(30min above)

3.4. Bayesian modeling analysis

The acquired data are combined with the network structure to construct a Bayesian network model with the function of predicting the international dissemination effect of micro short plays. 300 sets of samples were randomly selected from the collected data, and 70% of the source data were used as the training set and 30% as the testing set to train and test the model parameters.

3.4.1. ROC curve analysis. The ROC curves of the Bayesian network model are shown in Fig. 1, and (a) and (b) represent the ROC curves of the training set and test set of the model. In the training set, under the ROC curve, the value of AUC is 0.812~0.823, and the value of AUC is between 0.5 and 1. The model realism is good and the trust value is high. In the test set, the value of AUC is 0.823 to 0.829, and the model has better predictive value.



(a)Training result (b)Testing result

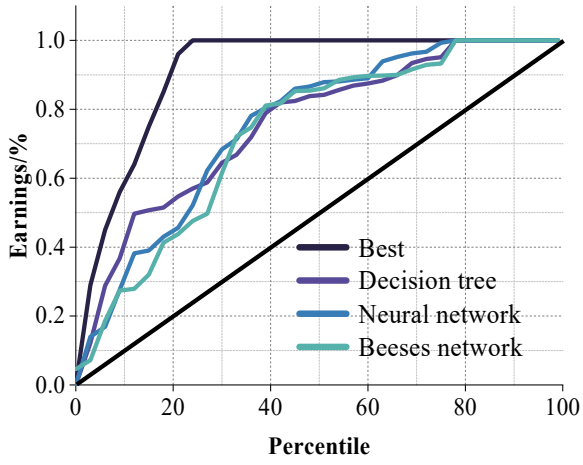
Fig. 1. The roc curve of the Beeses network model

3.4.2. Comparison of model correctness. The decision tree model and the neural network model were selected for comparison, and the model was tested in several iterations until the correct rate of the model reached a stable level. The correct rate of the last run of the model was selected, and the results of the correct rate of the classification model are shown in Table 2. The accurate results of the models are all better, the fitting level is more appropriate, and all of them have reference value. The correct rates of the decision tree and neural network models numerically show little overall difference. The Bayesian model has a 90.00% correct rate and a 10.00% error rate in the training set, and a 84.44% correct rate and a 15.56% error rate in the test set. In the training set, there are 189 correct predictions and 21 incorrect predictions. The correct prediction rate is 86.68% and 68.89% for the training and test sets of decision tree and 83.33% and 64.44% for neural network respectively. In terms of the correct rate of the training set and test set, the Bayesian network model in this paper has the highest correct rate of predicting the international dissemination effect of micro short drama.

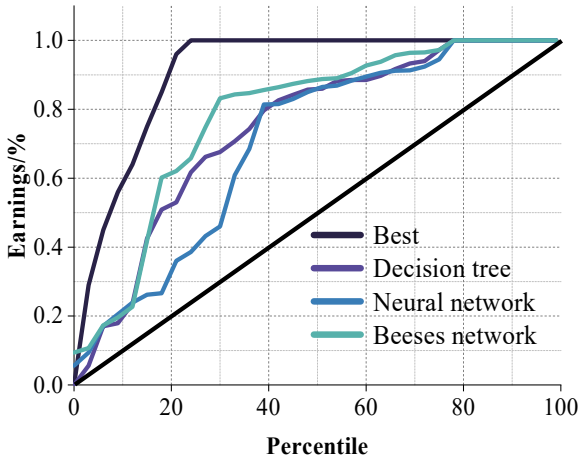
Table 2. The accuracy of the classification model

Model		Right	Error	Accuracy rate	Error rate
Decision tree	Training	182	28	86.67%	13.33%
	Testing	62	28	68.89%	31.11%
Neural network	Training	175	35	83.33%	16.67%
	Testing	58	32	64.44%	35.56%
Beeses network	Training	189	21	90.00%	10.00%
	Testing	76	14	84.44%	15.56%

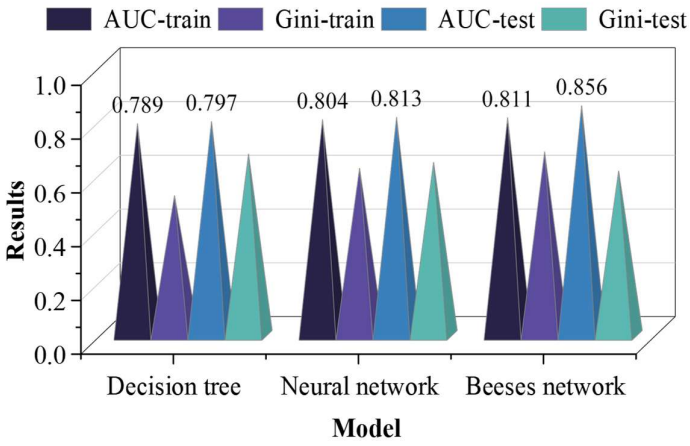
3.4.3. Model Performance Comparison. The gain curves of the decision tree, neural network, and Bayesian network are shown in Fig. 2, with (a) and (b) denoting the gain curves of the model's training and testing sets. The performance of all three models is somewhat different from the best model, and the performance between the models is basically the same with little difference. The values of AUC under the ROC curves of the three models are shown in Fig. (c), and the AUC value of Bayesian network in the training set is 0.811, which has the highest model value trust relative to the other two models. In the test set, the AUC value of Bayesian network is 0.856, which is higher than the other two models. From the value of AUC, the Bayesian network model has better predictive performance than the decision tree and neural network models.



(a)Training result



(b)Testing result

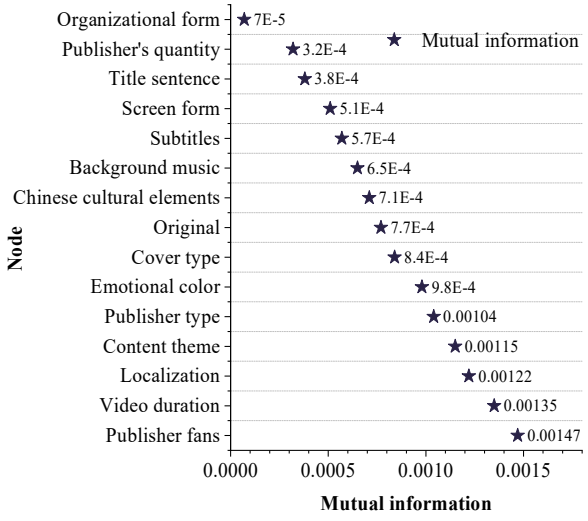


(c)AUC value

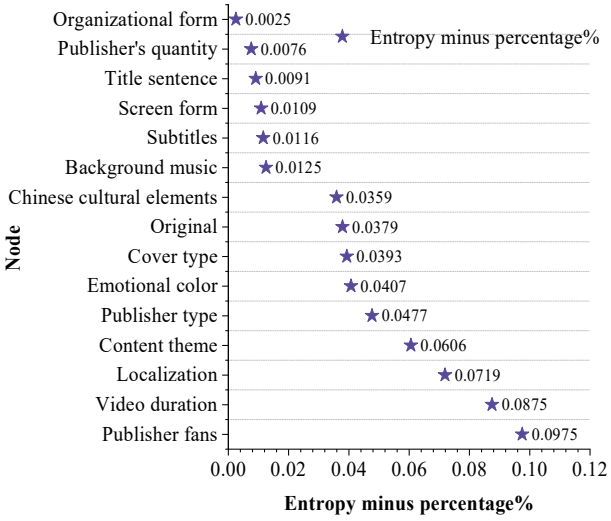
Fig. 2. The earnings curve of the three models

3.5. Node sensitivity analysis

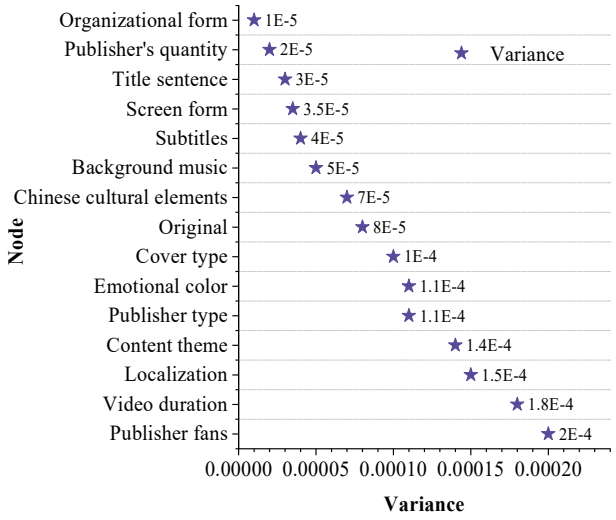
The analyzed variable is set as "dissemination effect" in the target variable, and the sensitivity analysis of other factors is conducted by Netica software, and the results of the sensitivity analysis of the target variable are shown in Fig. 3, with the results of mutual information, entropy reduction percentage and variance shown in (a) to (c), respectively. The number of publishers' fans, video duration and localized creation have the most significant influence on the international dissemination effect of micro short plays, with entropy reduction percentages of 0.0975%, 0.0875% and 0.0719%, respectively. This is followed by content theme, publisher type and emotional color, with entropy reduction percentages of 0.0606%, 0.0477% and 0.0407%, respectively. They are followed by cover type, whether original or not, Chinese cultural elements, soundtrack, subtitle, and screen format, with entropy reduction percentages ranging from 0.01% to 0.04%. Lastly, there are title sentence style, publisher's contribution, and organization form, and the entropy reduction percentages are all less than 0.01%.



(a)Mutual information



(b)Entropy minus percentage



(c)Variance

Fig. 3. Target variable sensitivity analysis

3.6. Scenario Simulation and Model Reasoning

The specific operation of scenario simulation in Netica is to set the a priori probability of a particular state of the test node as necessarily occurring (100%), and then the Netica software will automatically calculate the a posteriori probability of the target node. The international dissemination effect of the micro drama is the target node, and the influencing factors are the test nodes.

The scenario simulation results of each node are shown in Fig. 4~Fig. 6. When the video publisher contains authentication, the dissemination effect of the video is strong, and when the video publisher contains personal authentication or institutional authentication, the probability values of the video dissemination effect indicator reaching strong are 34.5% and 37.3%, respectively. From the perspective of the variable of video length, the overall trend of the shorter the video length, the stronger the dissemination effect, when the video length is less than 5 minutes, the probability of the video dissemination effect indicator to reach a strong value of 38.2%, and when the video length is more than 10 minutes the probability of the video dissemination effect indicator to reach a strong value of about 33%. The relationship between the number of publishers' fans and the video dissemination effect is opposite to the video length, the more the number of publishers' fans is, the stronger the video dissemination effect is, when the number of publishers' fans is large, the probability value of the video dissemination effect indicator reaching a strong value can reach 35.9%, and the probability value of the video dissemination effect indicator reaching a strong value in the case of the number of publishers' fans is small is 29.6%. In terms of the choice of content themes, the international dissemination effect of micro short dramas with novel themes is the strongest.

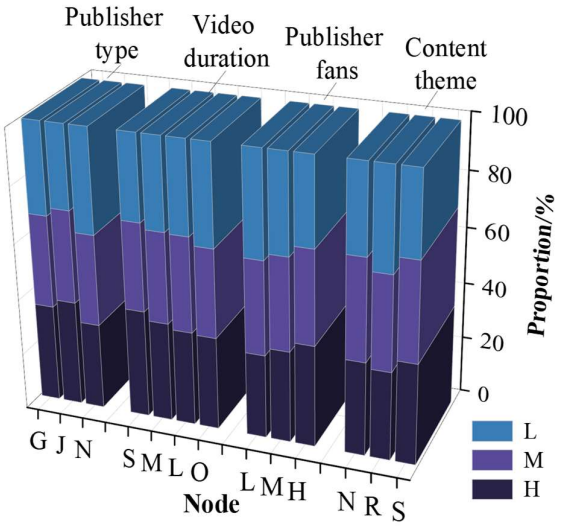


Fig. 4. Node scenario simulation 1

From the results of node scenario simulation 2, the probability value of the international communication effect of the microshort drama being strong is 37.8% when the microshort drama contains elements of Chinese culture. The probability value of strong international communication effect is 37.5% when the micro-skit is original. In the aspect of emotional color, the communication effect of micro-dramas with significant emotional color is stronger than that of micro-dramas without significant emotional color, and the probability values of strong and medium in the video communication effect indicators are 36.7% and 33.6% respectively, which are higher than those of 32.6% and 31.6% for videos without significant emotional color.

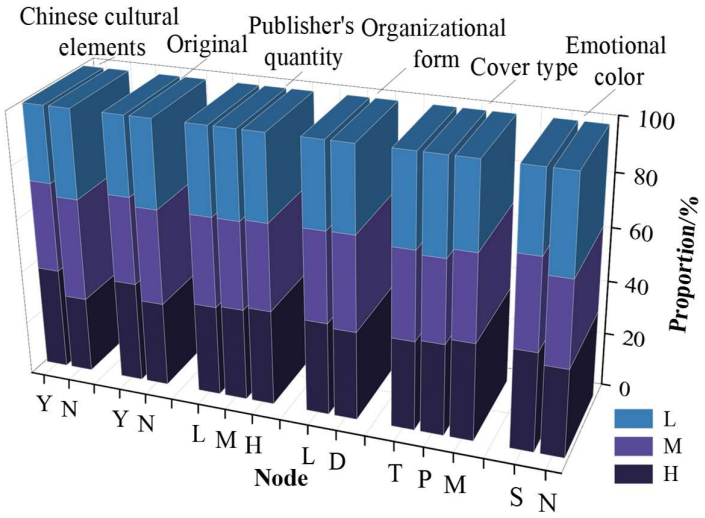


Fig. 5. Node scenario simulation 2

From the results of node scenario simulation 3, it can be seen that localized creation has a greater impact on the international dissemination effect of the micro-skit, and the probability value of strong dissemination effect when the micro-skit contains localized creation is 38.7%. The communication effect of using exclamatory and interrogative sentences in the title sentence form is better, and the probability values of the communication effect indicators of micro short dramas reaching strong are 34.8% and 35.9% respectively, while the probability values of imperative and declarative sentences are 33.5% and 33.1% respectively. In terms of screen format, the probability value of vertical screen videos reaching a strong communication effect is 36.2%, which is better than that of horizontal screen

videos, which is 31.6%. The probability values of reaching a strong dissemination effect for micro skits with soundtracks and subtitles are 34.6% and 34.7%.

Based on the inference results of the above Bayesian network's evaluation model of the international dissemination effect of micro-short dramas, this paper obtains the theoretical state in which the state of the node indicators of the international dissemination effect of micro-short dramas reaches the optimal result. That is to say, the publisher type is institutional authentication, the video length is within 5 minutes, the number of publisher's fans and publisher's contribution is large, the organization form is joint contribution, the content theme is novel, involving Chinese cultural elements and localized creation, the video is original, with significant emotional color, using picture + text type cover, the title sentence is questionable, and the screen form is vertical, with soundtrack and subtitle. When all the above conditions are met, the probability value of the international communication effect of the micro short drama at this time reaches as high as 83.5%, and the probability value of the communication effect is moderate and weak is 9.34% and 7.16%.

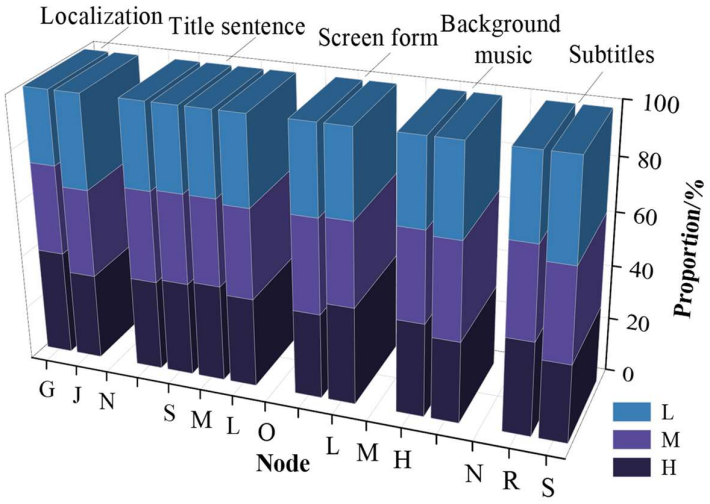


Fig. 6. Node scenario simulation 3

4. Strategies for optimizing the international dissemination of microshorts

Based on the analysis of the Bayesian network-based model of the international communication effect of micro-short dramas, this chapter discusses the optimization strategy of the international communication of micro-short dramas.

4.1. Actively guide the creation of high-quality products

In view of the current problem of vulgarization of microshorts, it is not only necessary to provide personalized content in a targeted manner in accordance with the audience market, but also to take the audio-visual construction of Chinese aesthetics as the kernel, and embed China's long history and values into the works of microshorts, so as to make China's excellent culture go overseas in a more innovative and energetic way.

First, choose storylines and scenes rich in Chinese cultural elements. These elements can involve traditional festivals, historical events, folklore and so on. Second, portray characters with Chinese values and promote traditional virtues such as integrity, filial piety and responsibility. Third, choose background music rich in Chinese traditional music elements, such as guqin and erhu. Fourth, skillfully handle the conflict and integration of Chinese and Western cultures in the narrative.

4.2. In-depth localization creation

In the future, it is necessary to carry out in-depth localized creation of short micro-dramas, which can draw on the advantages of European and American film and television dramas, such as light weight and short duration, and explore the creation mode of "overseas local themes + Chinese short drama narrative structure". Firstly, combine with famous overseas IPs to produce micro-drama works with different cultural backgrounds. Secondly, add elements that are widely recognized and attractive in the cultures of the target countries, so as to make the micro-dramas closer to the cultural background and aesthetic habits of overseas audiences.

4.3. Accelerate the integration of art and technology innovation

At present, some AI technology providers are entering the micro short drama overseas track, providing short drama platforms and producers with AI capabilities such as script development, short drama face changing - replacing Asian faces with European and American faces, intelligent dubbing, and dynamic adaptation of mouth shape, etc. AI technology can provide creators with functional assistance in the whole creation cycle from story conception, plot arrangement, content writing, and even character AI technology can provide creators with functional assistance for the whole creation cycle from story conception, plot arrangement, content writing, to character dialog, illustration production and content judging.

4.4. Strengthening comprehensive governance in the sector

The standardized governance of the micro-short drama industry needs to be continuously deepened, and the relevant government management departments should play a leading role in coordinating and actively study and promote the inclusion of online micro-short drama apps and small programs in the daily management of institutions, and promote industry self-regulation and mutual supervision. In addition, the independent supervision within the overseas platform is also a key part of the comprehensive governance of the micro-short industry.

5. Conclusion

By virtue of its unique form, micro short drama has strongly entered the international market and gained rapid development. This study uses Bayesian network to build a network model of the factors influencing the international communication effect of micro-short dramas, analyze the model performance and carry out scenario simulation to obtain the optimal plan for the international communication effect of micro-short dramas, and then propose the optimization strategy for the international communication of micro-short dramas.

The AUC value of the constructed Bayesian network model is above 0.8 in both the training set and the test set, and the trust value of the model is high, and the correct rate of the Bayesian network model in the training set and the test set is 90.00% and 84.44%, respectively. And its AUC value and correct rate are higher than the decision tree and neural network models, which reflects a better model performance.

Nodal sensitivity analysis yields that the number of publishers' fans, video duration and localized creation are the three elements that have the most obvious influence on the dissemination effect, with entropy reduction percentages all greater than 0.07%. Through the scenario simulation to verify the specific influence of each variable on enhancing the international communication effect of micro short dramas, and combined with the results, the theoretical optimal plan of communication effect is derived, and the probability value of communication effect reaching strong is as high as 83.5%.

In the process of micro short drama creation, firstly, it should actively guide the creation of high-quality products and integrate traditional Chinese culture. Secondly, in-depth localized creation should be carried out and a new production mode should be explored. Once again, accelerate the integration

of art and technology innovation, help short plays to reduce costs and increase efficiency. Finally, it is necessary to strengthen the comprehensive governance of the industry and promote the sustainable development of the international communication of short micro-drama.

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