Analysis of cross-cultural communication strategy of film and television based on SWOT model analysis

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ABSTRACT

Cultural trade is one of the main activities of cross-cultural communication. With globalization, the proportion of cultural trade in international trade has gradually increased, which plays an important role in promoting national economic growth and enhancing cultural influence. Among all kinds of cultural media, film and television media have great international communication ability, and the visual images spread through film and television media are easy to be understood and accepted by people of different countries and cultures, with the widest audience and coverage. Based on SWOT analysis, this paper constructs an information processing model of cross-cultural communication of film and television culture in the context of new media, and puts forward a prediction algorithm of social network information communication based on dynamic adaptive network. The results show that the prediction algorithm proposed in this paper performs well on both data sets, and the accuracy can reach 95.88%. Compared with other methods, its prediction accuracy is obviously improved. The proposed social network information dissemination prediction algorithm can more truly reflect the information dissemination law of social networks in reality, improve the efficiency of film and television cultural information processing, and can provide support for the study of cross-cultural communication strategies of film and television.

Keywords: SWOT model; Film and television; Cultural transmission

1. INTRODUCTION

With the continuous improvement of living standards, people's material needs have been met, and they have begun to pay more attention to spiritual and cultural needs. The spread of film and television culture should also meet the hobbies and interests of the current audience [1]. Many excellent film and television dramas in China are based on the theme of Chinese film and television culture and national spirit, showing the profound culture of our country to the people of the world. Film and television products contain a country's cultural values and lifestyle, and film and television culture plays an important role in the process of promoting the soft power of the country's culture and promoting the "going out" of China culture. Therefore, China attaches great importance to the spread of film and television culture [2]. However, the traditional ways and means have great limitations, only staying in traditional media such as radio and newspapers, and the coverage is not wide enough, and it is difficult to arouse public resonance and support [3]. With the development and penetration of new media technology, it has brought great influence to the film and television culture industry, which is not only beneficial to the development of the film and television culture industry, but also brings challenges to the film and television culture industry [4]. By using SWOT model to analyze the advantages, disadvantages, opportunities and threats of film and television cross-cultural communication, we can see that the film and television cultural industry has unique advantages and rare development opportunities. However, in order to achieve sustained and healthy development, we must deal with the relationship between film and television communication and cultural development [5]. In the process of film and television culture communication, we must take into account the social repercussions. The influence of this industry is greater than expected. It is necessary to fully understand the functions, development trends and means of different new media, optimize the communication channels and enhance the control over new media.

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On the one hand, social development in any period is inseparable from the promotion of science and technology. At this stage, new media has become the main force to promote the development of the industry, and people's production and lifestyle are constantly changing [6]. In the context of new media, film and television culture has become more and more strongly characterized by the combination of vision, hearing and images in communication; At the same time, the forms and channels for people to obtain film and television cultural content become more diverse, and people can freely choose the film and television cultural works they want to watch just by sitting at home [7]. In the face of massive information, how to make the film and television culture industry pay attention is a problem that we must solve. Specifically, on the basis of in-depth understanding of the characteristics of online media communication, various ways suitable for online marketing should be adopted to promote the rapid development of film and television cross-cultural communication industry [8]. On the other hand, globalization provides an opportunity for the development of soft power of film and television culture, but also brings the danger of cultural homogeneity. Under the impact of globalization, national culture is losing its own personality day by day [9]. Therefore, film and television cultural communication enterprises should not only enhance their influence, but also ensure the reliability of film and television cultural communication, so as to win everyone's love and respect. In the process of film and television culture development, especially in the context of new media, relevant film and television producers should abandon the disadvantages of traditional production mode, innovate and reform, and make new media become a fast, convenient and informative cultural communication channel [10]. At the same time, it is necessary to satisfy people's pursuit of values and truly let film and television culture enter people's hearts and daily lives. Based on SWOT analysis, this paper constructs an information processing model of cross-cultural communication of film and television culture in the context of new media, and puts forward a prediction algorithm of social network information communication based on dynamic adaptive network. In order to reflect the information dissemination law of social networks in reality more truly, improve the efficiency of film and television cultural information processing, and provide technical support for the study of cross-cultural communication strategies of film and television.

2. METHODOLOGY

2.1 Construction of information processing model for cross-cultural communication of film and television culture

The soft power of film and television actually refers to the degree of infection caused by the film in the audience [11]. This effect can be divided into four levels: the allure of the video, the appeal of the image, the adsorption of the shadow, and the weathering of the shadow. These four levels have their own functions and coexist with each other, forming the film soft power effect level system. Combining SWOT analysis with cross-cultural communication of film and television to evaluate related factors can make a comparative analysis and evaluation of the internal environment and external environment, macro environment and micro environment, advantages and disadvantages of the same thing, which is concrete, systematic and scientific. Based on SWOT analysis, this section constructs an information processing model of cross-cultural communication of film and television culture in the context of new media, and puts forward a prediction algorithm of social network information communication based on dynamic adaptive network. It makes it possible to deal with the information of cross-cultural communication of film and television culture fully and efficiently. The information processing model of cross-cultural communication of film and television culture consists of two parts: manual and computer. Through the reasonable combination of human brain and computer computing power, the information can be processed quickly, accurately and efficiently by using technical means such as text digitization, image description and data mining. The information processing model of cross-cultural communication of film and television culture is shown in Figure 1.

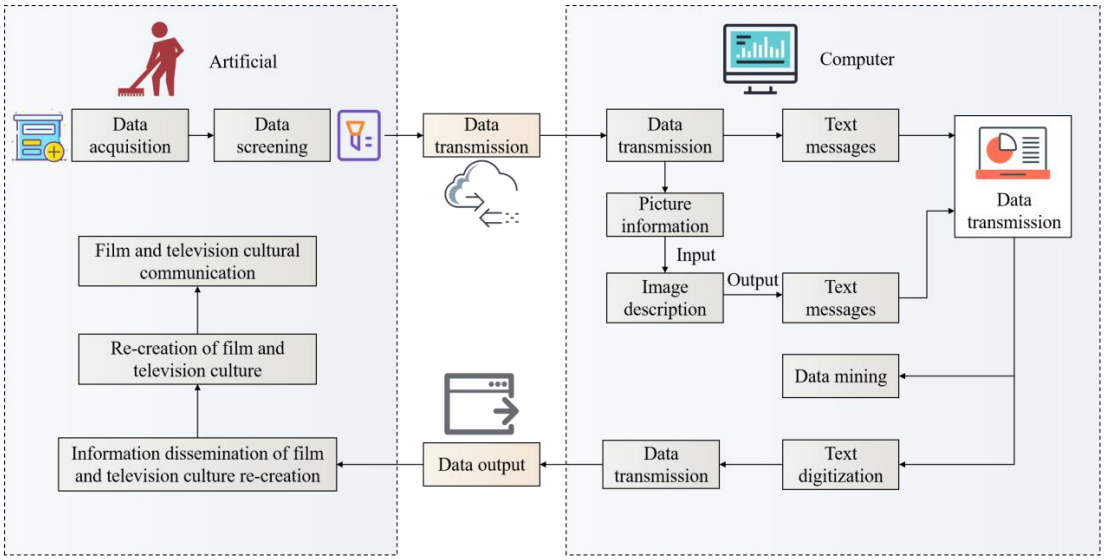

Figure 1. Information processing model of cross-cultural communication of film and television culture

The so-called information dissemination means that people exchange their opinions and ideas with each other through symbols or signals, so as to realize mutual understanding and influence [12]. In social networks, information dissemination refers to the process of information dissemination through social networks, in which the information disseminated includes rumors, opinions, comments, user behavior and other forms. At present, online social networks have shown great influence in information dissemination. According to the analysis and research of information dissemination model, it is the research core of information dissemination analysis to simulate and deduce the process of information dissemination. There are two typical information dissemination models: one based on group state and the other based on network structure. In order to spread information efficiently in social networks, we need to measure the influence of users and choose the nodes with high influence as the source of communication. The information published by influential users is more likely to be commented or forwarded by other users, thus ultimately affecting more users, thus making the spread of the message wider. Literal dataization refers to converting literal information and natural language description sentences into data, and solving the understanding problems caused by the complexity of literal expression through the processing of literal information. The specific steps include keyword extraction and word frequency statistics. The information processing model constructed in this study first converts the image information of film and television cultural life scenes and Chinese text information into data. According to the output of the data, it analyzes the spread trend of film and television culture, understands which cultures are more likely to attract the public, and then thinks about the current development trend of film and television culture, and takes corresponding measures to avoid the decline and disappearance of some "unpopular" cultures.

2.2 Prediction algorithm of social network information dissemination based on dynamic adaptive network

Prediction is mainly to evaluate the development trend and direction of things, and it achieves the purpose of information prediction by using the classification of data or estimating the specific value of data [13]. First, we need a model based on the obtained data, and then we can estimate the unknown variables through the model. Among the forecasting methods based on statistical models, the time series model is the most widely used. Its basic idea is to study the changing trend of time series by regression method, and to establish a prediction model. This paper holds that only by fully considering the static and dynamic characteristics of the network when modeling can we accurately reflect the essential laws of information dissemination in social networks, and then reveal the core mechanism hidden in the complicated and changeable information dissemination process. Therefore, a social network information dissemination prediction algorithm based on dynamic adaptive network is proposed [14]. In this paper, the topological structure diagram of the original social network is transformed into an H-hop diagram, so that the seed nodes are scattered in the network, which can avoid the adjacency between the seed nodes and the overlapping influence between the seed nodes. All the nodes

that can be reached within the H hop are their neighbors. The four cultural communication states of S, I, K and R are expressed as states 1, 2, 3 and 4. The crowd density of four states is expressed as x_i, and it is assumed that:

$$x = (x_1, x_2, x_3, \ldots, x_4)^T \quad i = 1,2,3,4 \tag{1}$$

When $i = 2$, the rate of i state increase propagation node is:

$$\beta SI + \theta KI \tag{2}$$

When $i = 1,3,4$, i status no longer has infected nodes, so there are:

$$F = \begin{bmatrix} F_1(x) \\ F_2(x) \\ F_3(x) \\ F_4(x) \end{bmatrix} = \begin{bmatrix} 0 \\ \beta SI + \theta KI \\ 0 \\ 0 \end{bmatrix} \tag{3}$$

Set:

$$V_i(x) = V_i^-(x) - V_i^+(x) \tag{4}$$

$V_2(x)$ is the rate at which BB state nodes transition to other states; $V_1(x)$, $V_3(x)$ and $V_4(x)$ are the change rates of nodes in S, K and R states, respectively. Therefore, there are:

$$V = \begin{bmatrix} V_1(x) \\ V_2(x) \\ V_3(x) \\ V_4(x) \end{bmatrix} = \begin{bmatrix} (\alpha + \beta + \varepsilon)SI \\ \gamma I \\ \theta KI + \mu KI + \varepsilon SI \\ -\gamma I - \mu KI - \alpha SI \end{bmatrix} \tag{5}$$

The degree of nodes is an important statistical feature to describe the attributes of nodes. In an undirected network, the degree of a node is defined as the number of edges directly connected to the node. In a directed network, the degree of nodes is divided into in-degree and out-degree according to the direction of the edge connecting the nodes. In-degree refers to the number of edges ending at the node, which indicates that the node is concerned by other nodes in the network; The degree is the number of edges starting from the node, which indicates the attention of the node to other nodes in the network. In order to simplify the model, this paper constructs the user network as an undirected graph structure without considering the one-way relationship between users. The network structure is relatively stable, regardless of the situation of users adding new friends; There are no orphaned nodes in the network. Therefore, it is necessary to eliminate the nodes with a degree of 0 in the network at the initial stage of building the model; There is only one propagation node in the initial state of the network, and the node is randomly selected; The node forwarded by the user at time t will be seen by all its neighbor nodes at the same time, regardless of whether the user is online or not; Whether the user accepts the information in the model is related to the influence of other users around him, the popularity of the information, the degree of interest of the user in the information, and the connection weight between the user and the propagation node. In order to find the basic reproduction number R_0 of the model, f and v are defined as follows:

$$f = \frac{\partial F_2(x)}{\partial x_2} = (\beta) \qquad v = \frac{\partial V_2(x)}{\partial x_2}(\gamma) \tag{6}$$

The spectral radius of fv^{-1} is expressed as $\rho(fv^{-1})$, which is the basic regeneration number R_0. For:

$$R_0 = \rho(fv^{-1}) = \frac{\beta}{\gamma} \tag{7}$$

According to the threshold theory of communication dynamics, the critical value of cultural communication is $R_0 = 1$. When $R_0 > 1$, the number of cultural communicators I will increase rapidly, leading to the outbreak of information; When $R_0 < 1$, the I of cultural communicators gradually decreases and will eventually disappear.

In this paper, the text dataization effectively eliminates useless information from massive data by efficiently extracting the core information in a long text. The statistical chart formed after word frequency statistics can make the key information in film and television cultural materials clear at a glance, and can effectively solve the huge workload problem caused by the complicated and diverse written expressions, the inconsistent information sources and recording methods. The evolution of views in the model is influenced by the network, and the evolution of views will also lead to the dynamic changes of the network. The proposed model includes several steps, such as building the model, calculating the trust set, updating the viewpoint, updating the network and judging the convergence conditions. User influence calculation based on information dissemination model mainly uses information dissemination model to simulate the information dissemination process and calculate the influence of nodes. Through the simulation of information dissemination process, the node is directly set to the active state to activate other nodes. In the whole information dissemination process, the number of activated nodes is the influence of the node. In this way, the influence of nodes can be directly obtained. After the propagation node successfully activates the neighbor node's state to the propagation state, the node's state will change from the propagation state to the immune state, and it will no longer participate in the subsequent information propagation process, while the successfully activated neighbor node will continue to spread the information as a new propagation node until no new node is activated in the whole network. From the description process of the algorithm, it is necessary to select an indefinite number of points that meet the conditions at each selected level, so the final number of initial activation nodes can be specified. In this paper, the size of the initial activation node is limited by adjusting other conditions that the selected node must meet.

3. RESULT ANALYSIS AND DISCUSSION

Dataization is an important method and means of information processing and protection. Quantifying everything is the core of dataization, and a reasonable processing mode will make the results more decision-making and discovery. Using the information processing model and social network information dissemination prediction algorithm constructed in this paper, according to the development trend of film and television culture, combined with the current self-media, film and television cultural information can be recommended to the public in the form of short videos; It can also be combined with the mobile client to push the film and television cultural information to the corresponding customers in real time to build a network platform for film and television cultural exchange.

In the training of social network information dissemination prediction model, the selection of features and the corresponding value of each feature will directly determine the prediction accuracy of the prediction model, so data processing is the core work in the early preparation of machine learning. All the work about data preprocessing in this paper is carried out in Linux redhat environment. Based on the above theoretical knowledge and the research and analysis of the algorithm, this section loads the real data set, adopts MATLAB technology, executes the algorithm flow, and makes prediction and analysis on the information dissemination trend. The prediction accuracy of the social network information dissemination prediction model proposed in this paper is analyzed by experiments, and compared with other commonly used prediction algorithms. The experiment uses the email data set and wiki-Vote data set in the real network. For the problem of maximizing influence, when using social network information dissemination prediction algorithm, the final set of seed nodes is selected according to the given number of seed nodes. Two different data sets will be used to test the model constructed in this paper. According to the data set selected in this paper, it is assumed that the total number of nodes in the network is 11,275, the offline reception rate of network parameters is 0.4, the forwarding rate is 0.5, the termination rate is 0.15, the propagation rate is 0.8, the offline node termination rate is 0.05, and the propagation node termination rate is 0.3. Figure 2 shows the training of the algorithm.

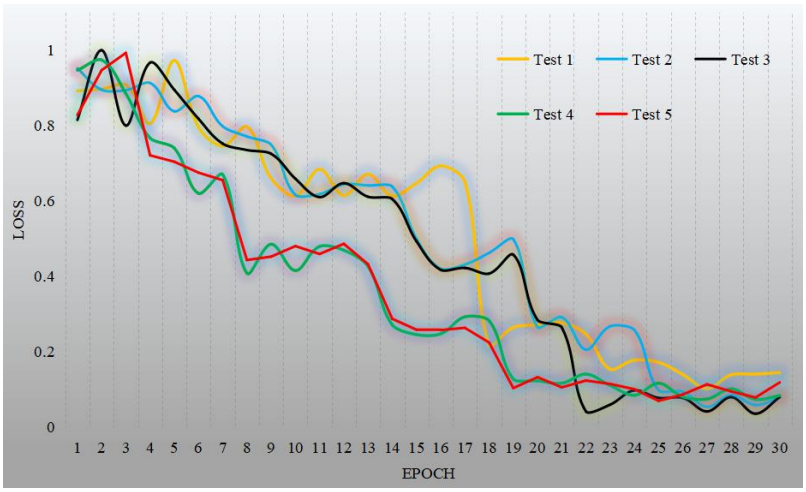

Figure 2. Training situation of the algorithm

Because this algorithm does not select nodes at every level, it is necessary to set at which levels to select nodes; Moreover, in order to limit the number of selected nodes, the scale of the overall selected initial activated nodes will be adjusted by limiting the minimum centrality value required by the selected nodes. The features of user's attention number have been counted in data preprocessing, so here we only need to search through the relevant files according to the user ID, and find the same user ID in the files, and the corresponding attention number will be extracted as features. In order to show the advantages and disadvantages of the social network information dissemination prediction model constructed in this paper more intuitively, some data are selected from the prediction set to show the prediction accuracy, as shown in Figure 3.

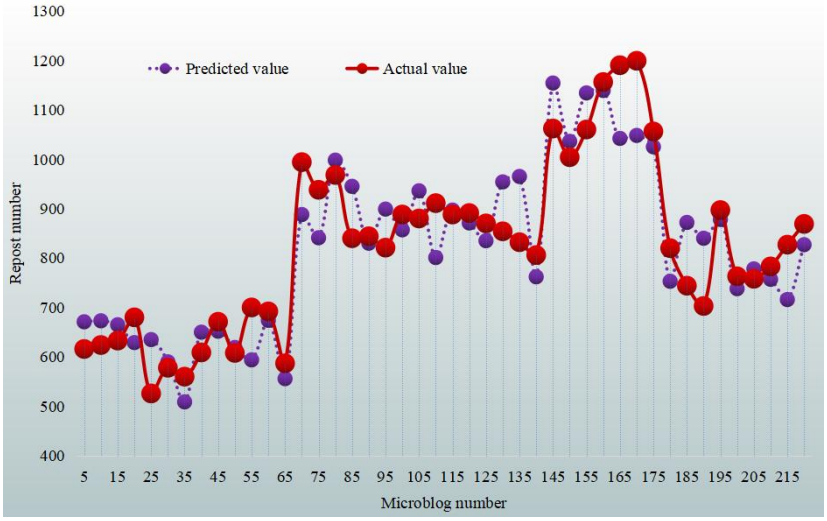

Figure 3. Comparison chart of predicted value and true value of algorithm

The figure shows the comparison between the prediction of Weibo's forwarding times by using social network information propagation prediction algorithm and the real forwarding times. It is obvious from the results in the figure that the coincidence rate between the predicted value and the real value is high. In the real social network, because of the mass and diversity of information and the inconsistency of people's allocation of time, a message will not be widely spread immediately after it is sent on the network, and almost all users in the network will not receive it. Therefore, compared with the other three models, the model proposed in this paper is closer to the actual situation and can more truly reflect the law of information dissemination in social networks.

In this paper, pandas library and numpy library under python are mainly used in data collation. Pandas is a tool based on NumPy, which is mainly used to solve data analysis tasks. It provides a large number of functions and methods that enable us to process data quickly and conveniently. Therefore, a large number of functions in pandas library are used in the process of sorting out the data, and all the features are processed into DataFrame format under pandas, and then the single features are merged into one table. After data classification, data processing will be more specific and operational, and the results will be more targeted and systematic. The accuracy of the prediction algorithm on the email data set is shown in Figure 4. The accuracy of the prediction algorithm on wiki-Vote data set is shown in Figure 5.

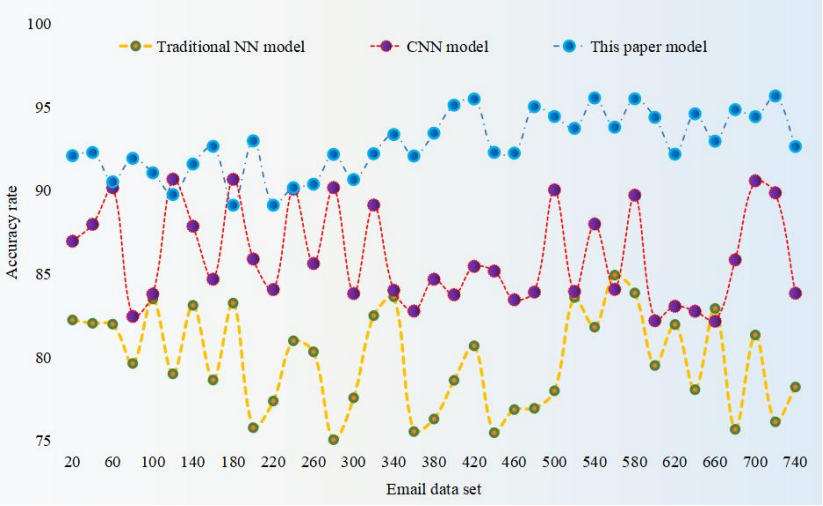

Figure 4. Accuracy comparison of prediction algorithms on email data sets

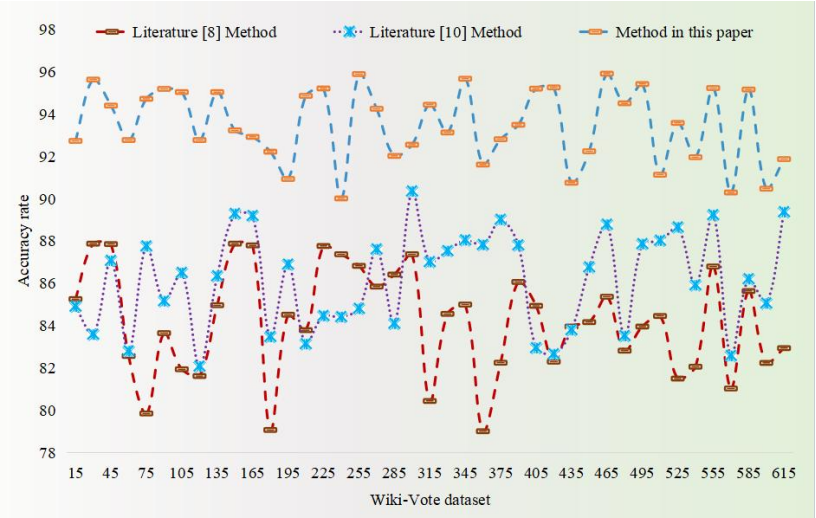

Figure 5. Accuracy comparison of prediction algorithms on wiki-Vote data sets

The experimental results in the figure show that the prediction algorithm proposed in this paper performs well on both data sets, and the accuracy can reach 95.88%. Compared with other methods, its prediction accuracy is obviously improved. This section proves that the social network information dissemination prediction algorithm proposed in this paper has better performance in predicting the trend of topic popularity through comparative experiments.

4. CONCLUSIONS

The continuous development of internet technology has promoted the transformation and reform of various industries in society. With the arrival of the new media era, the communication channels and contents of film and television culture have also undergone essential changes. In recent years, the research on news dissemination in social networks has made great progress, but there are still some shortcomings. Aiming at a series of problems existing in social network information dissemination model and prediction algorithm, this paper takes SWOT analysis as the research basis, and constructs an information processing model of cross-cultural communication of film and television culture in the context of new media. At the same time, a social network information dissemination prediction algorithm based on dynamic adaptive network is proposed. In this paper, the public data sets in reality are used, and different models are used to simulate the whole information dissemination process, and the algorithm proposed in this paper is analyzed and demonstrated experimentally. The experimental results show that the prediction algorithm proposed in this paper performs well on both data sets, and the accuracy can reach 95.88%. Compared with other methods, its prediction accuracy is obviously improved. The proposed social network information dissemination prediction algorithm model realizes efficient, fast and convenient information processing; It can more truly reflect the information dissemination law of social networks in reality. Film and television products contain a country's cultural values and lifestyle, and film and television culture plays an important role in the process of promoting the soft power of the country's culture and promoting the "going out" of China culture. The algorithm studied in this paper can improve the efficiency of film and television cultural information processing, and provide some technical support for the study of cross-cultural communication strategies of film and television, so as to improve the soft power of China culture, which has high reference value.

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