

Retraction

Retracted: BDA of the Dissemination of Opera in the Internet Self-Media Environment

Scientific Programming

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] X. Xie, "BDA of the Dissemination of Opera in the Internet Self-Media Environment," *Scientific Programming*, vol. 2022, Article ID 3096890, 12 pages, 2022.

Research Article

BDA of the Dissemination of Opera in the Internet Self-Media Environment

Xiaodi Xie 

¹College of Music and Dance, Xuchang University, Xuchang 461000, Henan, China

Correspondence should be addressed to Xiaodi Xie; 12014273@xcu.edu.cn

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With the advent of the era of big data, the TV media industry has begun a new round of survival of the fittest. Some new and original traditional cultural TV programs have successfully attracted the attention of the audience, but some programs have lost the impact of the big data environment and are facing the crisis of revision or suspension. Based on the background of big data and from the macro perspective of society, this article made a specific description and objective analysis of the concept, characteristics, and real development of opera communication and proposed an understanding. On this basis, through the analysis of actual cases and data, combined with the dissemination of opera and the new and original traditional cultural TV programs in recent years, this article analyzed the impact of big data on the dissemination of opera and further explored the survival state of opera dissemination in the context of the era of big data, and the experiment was to crawl the data of 10 traditional Chinese opera categories in the Shipin Opera Network through web crawler. It was sorted according to the amount of play, the top 10 songs of each genre and their play volume were selected, and then the Internet correlation between the genres was quantified. And a big data analysis of the traditional opera program “Liyuanchun” was carried out. The experimental results showed that the show was broadcast 65,984 times a day, the highest broadcast volume in a week. At the same time, according to the big data analysis of users of self-media opera dissemination, the majority of the audiences had a high school or technical secondary school education, which accounted for 27%, followed by junior high school, which accounted for 18.7%. It can be seen that the current Chinese traditional culture TV programs have a good development trend and a lot of room for development.

1. Introduction

As a type of music, opera music has a very long history. With the development of society, many changes have taken place in the way of dissemination of opera music. In the early stage, the dissemination of opera mainly relied on the word of mouth of the artists. Later, with the continuous development of electronic technology, radio stations, records, and other media appeared, which made the opera music recorded and spread more widely. After the popularization of photography technology, the musical elements in opera film and television are more diversified, and a large number of new technologies have been applied to the dissemination of opera music. After the rise of the Internet, the dissemination of opera music through the Internet has greatly

promoted the inheritance and development of opera music. In the context of the current continuous development of science and technology, this article analyzed the content and characteristics of the social dissemination of Chinese opera music in the Internet + era, and explored the advantages and disadvantages of its dissemination. It is necessary to discuss corresponding measures on this basis, so as to promote the spread and development of opera music in a wider range in the Internet+era. From a theoretical point of view, the dissemination of opera music based on the Internet can enrich the theoretical content of traditional opera music dissemination, extend the theoretical scope of traditional opera music research, and promote the in-depth study of opera music theory. From a practical point of view, by studying the dissemination of opera in the Internet self-

media environment, it can provide practical guidance for the development and exchange of opera music, and play a role in promoting the transformation and development of traditional opera music and the diverse exchange of opera music culture.

Mass media play an important role in health risks. Tang and Rundblad corpus-based study of media reports on personal health drew attention to natural science uncertainty and professional risk language surrounding pollutants [1]. Byrum discussed the use of information carriers to convey corporate social responsibility messages to promote eco-procurement participation. By changing the dissemination dimension of fictitious CSR campaigns sent by social media, the study found statistically significant differences in consumer-to-consumer communication in stimulating eco-buying engagement [2]. Social media becomes increasingly important in risk and crisis situations. Yoo et al. study found which types of social media have a greater impact on risk perception and behavior, thereby revealing the cognitive mechanism behind the process of risk information on social media shaping people's behavioral intentions, and whether it has different effects on people's risk perception and behavioral intention [3]. Rashid research found that social media allows for unrestricted social interaction and democratizes the media itself. We-media features many-to-many communication, including social spaces, where individuals can gather and discuss issues of common concern, helping to redefine their identities [4]. Digital media is becoming an integral part of social communication. Guan et al. studied and investigated cultural values affecting psychological and physiological responses to social support, and independent but not interdependent self-explanations moderated the associations between support environments and psychological or physiological measures [5]. There are also various problems in the dissemination of opera culture based on the Internet. In the process of in-depth integration of "Internet + opera," the solution of related problems will become a key factor affecting the development of traditional opera.

Lee investigated the potential link between strategic competencies in intercultural communication and perceptions of English variety. Structural equation modeling results suggested that English variant perception mediates between IDLE and intercultural communicative strategic competence, providing pedagogical insights into readiness for intercultural interaction in a multicultural setting [6]. Cloud computing and big data analysis are used to calculate and analyze the data, so as to get more design elements in line with the design elements. Wu and Li research found that the Internet of Things technology and cloud computing have obtained more information for many fields, thereby assisting the field to complete deeper analysis and research [7]. The increasing popularity of social networks has made social networks an important place for the dissemination of digital content, and also brought new business models. Huo et al. research found that the commercial application of social network needs to strike a balance between the different interests of these parts of the relevant parties, so Huo proposed a distributed logic that combines distributed

temporal logic and activity rules [8]. Jennex reversed the pyramid by assuming that there is more knowledge than data, showed knowledge management as the extraction of the pyramid, and extended the revised knowledge pyramid to include IoT and big data applications in the promotion of opera we-media [9]. The growing gap between users and big data analytics becomes computationally inefficient. Ahmad proposed a system architecture using an artificial bee colony (ABC) to select features, and a Kalman filter was used in the Hadoop ecosystem to remove noise and improve processing efficiency [10]. Although as a traditional art form, while adhering to the essence of its own culture, traditional Chinese opera has completed the integration with different stages of media, thus promoting its own development [11]. In the process of continuous transformation of the media, traditional Chinese opera is also innovating in content and form to adapt to the changes in people's cultural needs in the new era.

2. BDA Method of Opera Dissemination in the Self-Media Environment

2.1. Big Data Technology. With the deepening of big data in all fields, people's understanding and definition of big data are also different. IDC defines data with large capacity, diversity, high speed, and high value 4V as large capacity data, and IBM believes that the fourth "V" must have reliability [12]. The application areas of big data are shown in Figure 1.

As shown in Figure 1, with the development of the times and the advancement of data processing technology, the amount of data that people can collect and organize has gradually increased. And there are many kinds of data, that is, the representation type of data is no longer single and limited, but tends to be diversified. It is compared with the past, people take the limited data that can be obtained as a sample for analysis, but in the era of big data, people can collect many kinds of data, so that the data is endowed with a certain social meaning [13]. With the application of new media technology and the development of data processing technology, people's purchases and consumption, watching videos, browsing web pages, participating in topic discussions, and other behaviors in daily life will leave some data record information, which makes the growth and flow of data faster and faster, and it is inevitable to continuously improve the speed of data processing [14]. In the era of big data, although the amount of data that can be collected is very huge, it may contain unstructured data and non-schema data. As a result, there may be some invalid data in the obtained large amount of data, which requires careful sorting, classification, integration, and analysis of the data. In short, the value density of data is inversely proportional to the total amount of data.

2.2. BDA Methods. Big data is not only a huge amount of data, but also more important is the analysis and processing of a large amount of data, and the useful information contained in these large amounts of data can be obtained

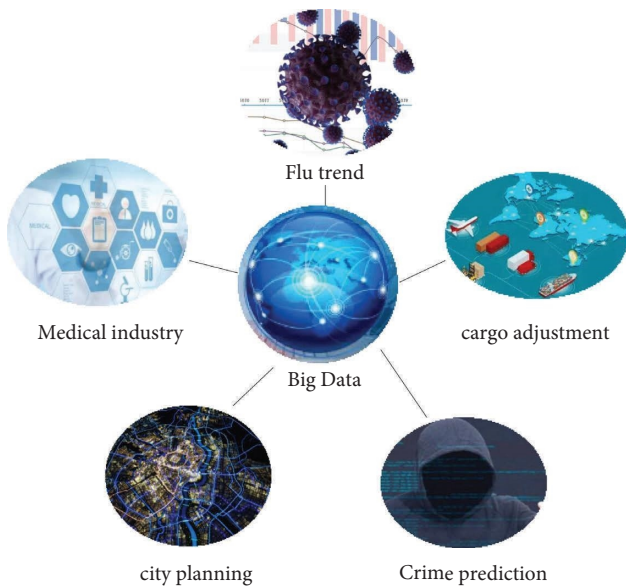


FIGURE 1: Application areas of big data.

after processing. Now, with the application of big data in the fields of social, economic, and technological research, the basic attributes of big data such as volume, speed, and diversity have been increased, so the method of big data analysis is particularly important [15]. When judging whether information is valuable, it is important that analytical methods are used appropriately. The method of big data analysis is shown in Figure 2, which generally has the following five basic aspects.

As shown in Figure 2, big data analysis mainly includes five aspects:

- (1) Visual analysis: the most basic requirement of big data analysis is the visualization of analysis results. Whether it is a data analysis expert or a general user, through visualization, the data can be displayed intuitively and the information behind the data can be conveyed to people.
- (2) Data mining: compared with visualization, data mining mainly takes computers as the object, and discovers the laws behind the data through centralized analysis or decentralized analysis of big data clusters, division, separation points, and detailed investigation of data structure patterns.
- (3) Predictive analysis: one of the main goals of big data analytics is prediction. Through data mining, it is possible to fully understand the data and make predictive judgments based on the regular information behind the data. In this way, the overall economic efficiency of the enterprise will be improved.
- (4) Semantic engine: big data technology is widely used on the Internet. The network platform predicts the potential consumption direction of customers through the keywords and tags of web pages retrieved by users, and sells the corresponding products according to the needs of customers, so as to achieve correct marketing.

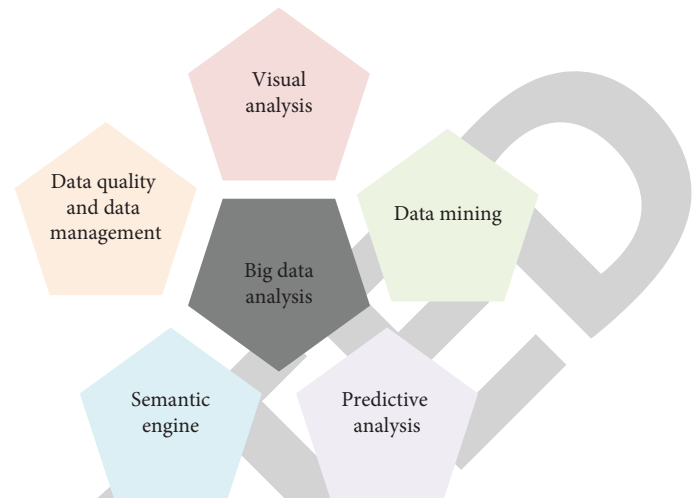


FIGURE 2: 5 aspects of big data analysis.

- (5) Data quality and data management: the guarantee of the validity of big data analysis results comes from the quality of data sources and data management. Through high-quality data sources and efficient data classification management, the reliability and validity of analysis results can be guaranteed, whether in scientific research or other application fields.

2.3. Art of Opera and the Spread of Opera. Opera is an audiovisual art that integrates various artistic means such as dance, music, literature, acrobatics, and martial arts. The art of opera is a unique dynamic art form in China, with a long history, and the public does not have too many objections to its basic concept. The reason why this article listed it separately was to define the art of opera to be studied in this article. There are many categories and genres of opera art, but this article regarded opera art as a whole and did not distinguish between different categories of opera [16]. Although different types of opera art have different audiences, the purpose of this article was to expand the spread of opera by studying the mobile media commonly used by contemporary people, so as to optimize the reception environment of art recipients [17]. This article focused on analyzing the dissemination method and effect of mobile media on opera art, and then proposed an ideal dissemination method, so that contemporary young people can gradually recognize opera, understand opera, and love opera.

Art communication can be divided and explained from the aspects of content, medium, audience, effect, etc. This section mainly discussed the characteristics of art communication and distinguished other communication categories by the characteristics of art communication. Art has the characteristics of image, esthetics, and emotion. According to the existence mode, perception mode, materialized form, esthetic principles, and other conditions of artworks, art can be divided into different types. But in the final analysis, works of art express the emotions of the creators and embody the esthetic cognition and feelings of the creators and recipients, which determines the characteristics of art communication. Art communication needs to

materialize the creator's esthetics to the art recipient, appeal to the creator's emotion, and use different communication methods to arouse the resonance of the art recipient, so as to realize the esthetic cognitive function, educational function, and entertainment function of art. Therefore, art communication pays attention to the mutual transfer of emotion between art creators and recipients, which was also the basis of this thesis.

2.4. Necessity of Disseminating Opera Art on the Internet through the Media. "Internet + media" is an important path for media development in the era of media convergence, and mobile phones are an important medium for carrying "Internet + media." "Internet + media" is the only way for the transformation of traditional media, and it is also a future-oriented communication form. Based on the transformation of the role of contemporary audiences and the reconstruction of traditional communication logic, the media have been upgraded and transformed one after another. Mobile media has become a platform for major media competition. Therefore, the use of mobile media to spread opera art is an inevitable trend in the current media integration development. Only by adapting to the trend can the dissemination of opera art be targeted. The dual role of the media and the audience has enriched the media resources and expanded the boundaries of the media, forming a new form of integrating traditional media and modern media [18]. Multi-channel integration improves the extension of information, stimulates the market trend, changes the way of competition, and also determines the dissemination orientation of opera art. Media integration can make the old resource space extend longer and increase added value through repackaging, so as to reform a new commercial value chain, and also promote the spread of traditional culture.

Technology enables people to "visit" times and places that were inaccessible in the pre-technological era. The medium is always moving in the direction that people want to develop, and the ultimate goal of development is to build an ecological niche that benefits people. When people's senses are not satisfied, and people cannot obtain information through the dissemination of the pre-technological era, new media technologies must be constantly created to compensate for the deficiencies of the past. In this context, whether the art of opera can be inherited and developed depends not only on the self-improvement of the art form, but also on whether it is better in the same field as other art forms [19]. Only when the dissemination of opera is close to the humanized development trend of the media, it can expand the breadth of the dissemination of opera and gain space for development. Just as mobile media has the characteristics of interactivity and timeliness, it meets the needs of modern and contemporary social groups, and is the direction people hope for its development. It adapts to the current audience's entertainment and interactive needs, and meets the extension of the audience's senses. A variety of communication methods make it easier for the audience to understand the art of opera, so that the dissemination of the art of opera is more extensive and three-dimensional.

2.5. Data Mining Algorithms. Data mining refers to the analysis and arrangement of big data to extract the mathematical relationship between the data and the variables implicit in the massive data. With the advent of the era of big data, the amount of information has increased exponentially, which makes the real relationship between massive data ambiguous and difficult to use directly, and traditional data processing methods have also failed [20]. The whole process of knowledge discovery in data is shown in Figure 3.

As shown in Figure 3, using data mining technology, by analyzing the data, it is possible to generate x rules at the same time, and x is shown in

$$X = \sum_{m=1}^{d-1} \left[\binom{d}{m} * \sum_{n=1}^{d-m} \binom{d-m}{n} \right] = 3^d - 2^{d+1} + 1. \quad (1)$$

2.5.1. Auto-Regressive Moving Average (ARMA) Model. If the time series is stationary, normal, and zero mean, the auto-regressive moving average model ARMA (n, m) can be obtained as shown in

$$f_t = \sum_{m=1}^j \gamma_m f_{t-1} - \sum_{n=1}^i \lambda_n \omega_{t-n} + \omega_t. \quad (2)$$

Among them,

$$\omega_t \sim \text{NID}(0, \delta_\omega^2). \quad (3)$$

2.5.2. Auto-Regressive (AR) Model. The auto-regressive model AR (n) is a special case of the ARMA (n, m) model. In the expression of the ARMA (n, m) model, the AR (n) model is shown in

$$f_t = \sum_{m=1}^j \gamma_m f_{t-1} + \omega_t. \quad (4)$$

2.5.3. Moving Regression (MA) Model. The moving regression model MA (m) is another special case of the ARMA (n, m) model. In the expression of the ARMA (n, m) model, the MA (m) model is shown in

$$f_t = \omega_t - \sum_{m=1}^j \phi_m f_{t-m}. \quad (5)$$

Since there is no auto-regressive part in the model, it is called the m -order moving average model, denoted as MA (m). The mining of the dissemination power of self-media operas is to mine and analyze the correlation of related information such as the number of readings and the number of likes in the release of operas in the self-media [21]. The data mining process is shown in Figure 4.

As shown in Figure 4, the formal description of the problem of mining the dissemination power of self-media operas is to view each release time as a transaction d_i , d_i records the obtained reading information, and all d_i form a transaction set D .

$$D = \{d_1, d_2, \dots, d_i, \dots, d_j\}. \quad (6)$$

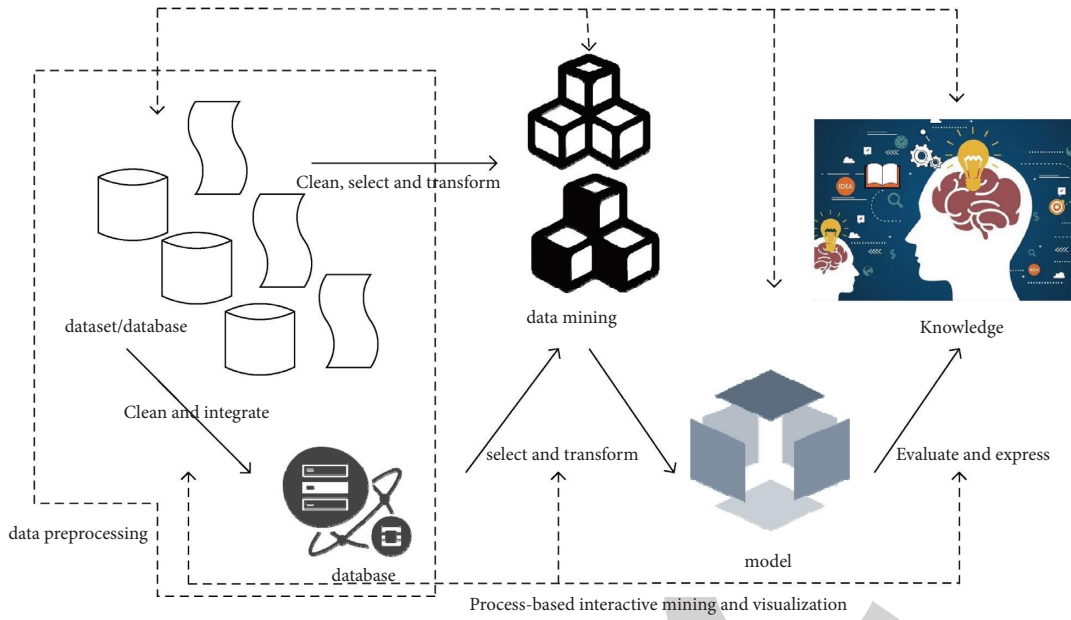


FIGURE 3: The whole process of knowledge discovery in data.

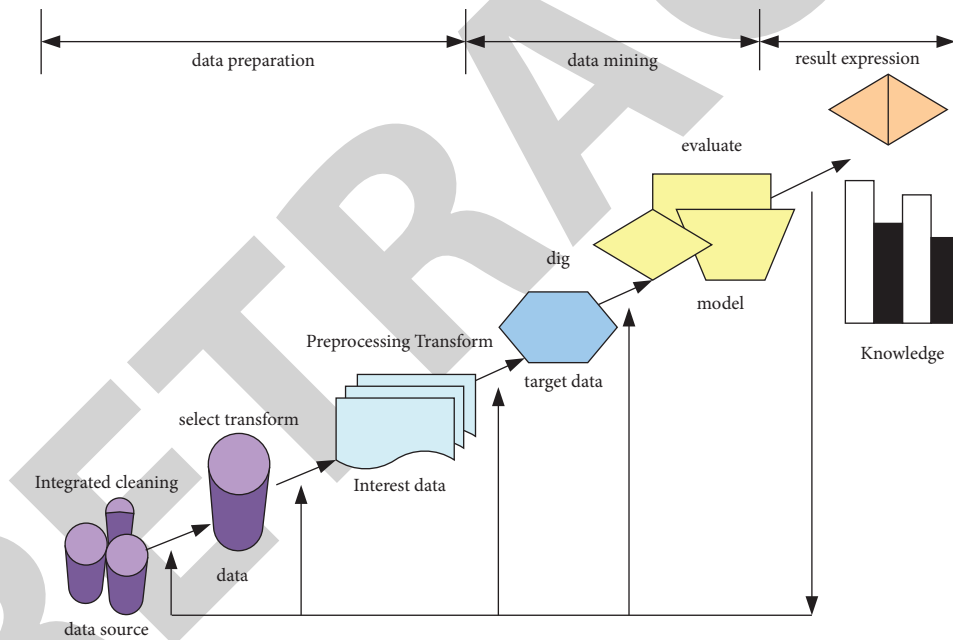


FIGURE 4: Data mining process.

Each reading source is regarded as an item and denoted as i_m , and all readings constitute an item set I as shown in formula (7). Each transaction d_i is a subset of I .

$$I = \{i_1, i_2, \dots, i_j, \dots, i_i\}. \quad (7)$$

The proportion of reading records containing the hazard source in i_1 is included in all reading investigation records, and the support degree is calculated as shown in

$$\text{support}(i_1) = \frac{\|d \in D \| I_1 \in D\|}{\|I_1 \in D\|}. \quad (8)$$

In formula (8), $\|D\|$ represents the total number of readings, and $\|d \in D \| I_1 \in D\|$ represents the number of readings in the reading dataset including the I reading set. When support (i_1) is greater than the given min_supp value, then i_1 is called frequent item-sets.

It is assumed that when reading set I_1 appears, reading set I_2 can be deduced with a certain probability:

$$\text{confidence}(I_1 \rightarrow I_2) = \frac{\text{support}(I_1 \cup I_2)}{\text{support}(I_1)}, \quad (9)$$

$$\text{lift}(I_1 \rightarrow I_2) = \frac{\text{support}(I_1 \cup I_2)}{\text{support}(I_1) * \text{support}(I_2)}.$$

If the lift degree is greater than 1, it is an effective strong association rule, which is the most valuable object for analysis. If the rule lifting degree is equal to 1, the former and latter terms are independent of each other, and there is no correlation. If the rule promotion degree is less than 1, the association rule has no practical significance.

2.5.4. Support Vector Machine. Support vector machine (SVM) is a supervised learning algorithm. Linear classification and SVM classification are shown in Figure 5.

As shown in Figure 5, the points on the space are divided into two categories in the n -dimensional space, and it is hoped to find a hyperplane to divide the two types of points. Such as (a) is a two-dimensional space, which is an example of linear classification. The point on the green line in (b) is called the support vector. The transformation of data features from low-dimensional space to high-dimensional space is shown in Figure 6.

As shown in Figure 6, the relationship between data features in a low-dimensional space may be more complicated, but the relationship between data features in a transformed high-dimensional space may become clearer.

When the data is mapped to a high-latitude space, the data dimension may be too large, resulting in a significant increase in computational complexity. The advantage of the kernel function is that it transforms the data from low latitudes to high latitudes, while avoiding calculations at high latitudes. The kernel function is calculated at low latitudes, and the method of expressing the calculation effect at high latitudes greatly reduces the amount of calculation [22].

In general, the mathematical form of the linear classification surface of SVM is

$$G(D) = w * D = 0. \quad (10)$$

The vector w is the weight coefficient and b is the threshold set by the SVM. Then let the training data satisfy $|g(D)| = 1$ to normalize, which is

$$y[(w * D_i) + b] - 1 \geq 0, i = 1, 2, \dots, N. \quad (11)$$

Among them, D_i is the sample used for SVM training, y_i is the category corresponding to the sample, and the classification interval of the sample is $2/||w||$, the purpose is to minimize the classification interval and definition:

$$L(w, b, a) = \frac{1}{2} (w * w) - \sum_{i=1}^n a_i \{ [(w * D_i) + b] - 1 \}. \quad (12)$$

Finding the partial derivatives of w and b , and setting the partial derivatives to 0 is equivalent to finding the maximum value of $Q(a)$ with respect to a_i under $\sum_{i=1}^n y_i a_i = 0$:

$$Q(a) = \sum_{i=1}^n a_i - \frac{1}{2} \sum_{i,j=1}^n a_i a_j a_j (D_i, D_j). \quad (13)$$

If a_i^* is the best solution, consider

$$w^* = \sum_{i=1}^n a_i^* \times y_i D. \quad (14)$$

Bring in the classification function:

$$\% f(D) = \text{sign}\{(w^* D) + b^*\} = \text{sign}\left\{ \sum_{i=1}^n a_i^* y_i (D_i D) + b^* \right\}. \quad (15)$$

Calculate the classification, if $f(D) = 1$, D is classified into this class, otherwise, it is classified into another class.

Manhattan distance (denoted as Ma), Euclidean distance (denoted as Eu), and Chebyshev distance (denoted as Ch) are all classical paradigm distances, and they are defined as

$$\text{Ma}(\gamma_x, \gamma_y) = \sum_{i=1}^{4^j} |\gamma_{x,A} - \gamma_{y,B}|, \quad (16)$$

$$\text{Eu}(\gamma_x, \gamma_y) = \left(\sum_{i=1}^{4^j} |\gamma_{x,A} - \gamma_{y,B}|^2 \right)^{1/2}, \quad (17)$$

$$\text{Ch}(\gamma_x, \gamma_y) = \max |\gamma_{x,A} - \gamma_{y,A}|, 1 \leq A \leq 4^n. \quad (18)$$

The frequency of occurrence of a k -tuple item is defined as the quotient obtained by dividing the number of occurrences of the k -tuple item by the sum of the occurrences of all k -tuple in the sample, which is the relative statistical value after simple normalization. Sample A is taken as an example, the frequency of occurrence of the x -th k -tuple item in the sample is calculated as

$$\gamma_{A,x} = \frac{Z_{A,x}}{k_A}. \quad (19)$$

Therefore, in formula (16), formula (17), and formula (18) that define the distances of the three paradigms, γ_A and γ_B are frequency vectors composed of $\gamma_{A,x}$ and $\gamma_{B,x}$, which are defined as

$$\gamma_A = \frac{Z_A}{k_A}, \quad (20)$$

$$\gamma_B = \frac{Z_B}{k_B}.$$

3. BDA of Opera Dissemination in the Self-Media Environment

“Pear Garden Spring” is mainly based on Henan Opera, and at the same time brings together various types of operas. In the form of the opera fans’ arena, the traditional opera culture is well displayed in front of the world, and it has become a brand column of Henan TV. Through the program of “Liyuanchun,” it can be found that in the process of development, “Liyuanchun” still adheres to the responsibility of inheriting the opera culture, and constantly changes and updates the original program form. It can be said that “Liyuanchun” has achieved remarkable achievements since

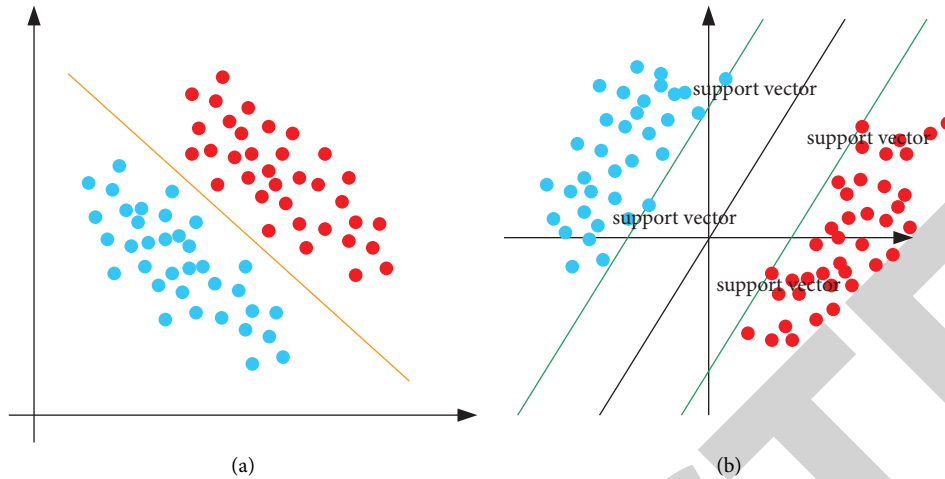


FIGURE 5: Linear classification (a) and support vector machine classification (b).

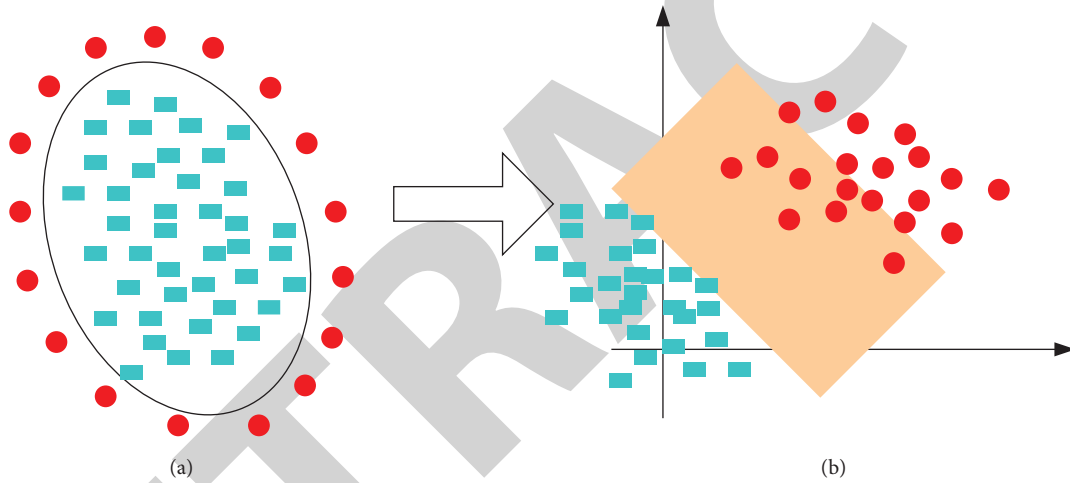


FIGURE 6: Data features are transformed from low-dimensional space (a) to high-dimensional space (b).

its inception. It not only gained a fixed audience, became famous in Europe, and won many awards, but also successfully carried forward the Chinese opera culture.

3.1. Traditional Chinese Opera Integrates Big Data Technology.

After the arrival of the era of big data, various fields actively apply big data to the development of the industry, and the application of big data technology is becoming more and more mature. People in the TV media have gradually realized that the audience rating is no longer the only criterion for evaluating the quality of a TV program, and the use of social media platforms also plays an important role in TV programs. Especially with the rise of Weibo and WeChat platforms, the frequent use of computers, mobile phones, and other terminals has generated a large amount of data [23]. In addition to the audience ratings, data such as click-through rate and reading volume of related news and topics have important reference value for evaluating a program. According to Tencent Video’s video playback index, “Liyuanchun” has been clicked and played 3.757 million times on Tencent Video, reaching the highest viewership

rating for the program in the past month. If one thinks about it carefully, there are traces of big data in the production and broadcasting of “Liyuanchun,” which fully reflects the power of big data. Judging from the attention and ratings of this program, the “Liyuanchun” column has indeed gained a higher rating and attention for itself with the help of the power of big data.

In addition, this article queried the Weibo TV Index, and “Liyuanchun” ranked 12th in the Weibo TV Index Daily Ranking on January 31, 2016. Among them, the number of readers was 68,000, the number of readings was 170,000, the number of mentions was 331, and the number of mentions was 383. Ranked 72nd in the Weibo TV Index Weekly Ranking from January 25 to 31, 2016. Among them, the number of readers was 235,000, the number of readings was 449,000, the number of mentions was 491, and the number of mentions was 607.

3.2. BDA after the Broadcast of “Liyuanchun”. On January 31, 2016, after the live broadcast of the year-end finals of the 2015 Chinese Drama Fan Contest in “Liyuanchun” and

“Boom in China,” people’s attention to “Liyuanchun” and the 2016-01-30 program did not stop. The release of relevant news from major media, the frequent appearance of online news, and the release of related articles on new media platforms such as Weibo hot topics and WeChat official accounts have prompted people to think of watching programs again through online videos.

This article collected the playback volume of “Liyuanchun” on iQiyi Video and Tencent Video from January 29, 2016 to February 4, 2016, in order to analyze the changes in the broadcast situation and broadcast data of “Liyuanchun” in the online video in the 1 week before and after the broadcast of the 2016-01-31 program. Figure 7 shows the video playback of “Liyuanchun” on Tencent and iQiyi.

As can be seen in Figure 7, from January 29 to February 4, 2016, the playback volume of “Liyuanchun” on the iQiyi video platform changed greatly. Among them, the broadcast volume on January 29, 2016 and January 30, 2016 was the lowest in a week, both 44,064 times; the broadcast volume on January 31 was 60,288 times, showing a significant increase compared with the previous 2 days; February 1 was the most played day of the week with 847,225 views, followed by February 2 with 338,087 views. Although the broadcast volume on February 3 and February 4 had a downward trend compared to February 1 and February 2, it still exceeded the broadcast volume from January 29 to January 31. Obviously, from January 29 to February 4, 2016, the playback volume of “Liyuanchun” on Tencent’s video platform did not change much. Among them, the playback volume on February 1, 2016 was 65,984, which was the highest playback volume in a week; the second was on February 2, and the playback volume was 53,803; January 31 had 47,117 plays, a slight increase from January 29 and January 30; the playback volume on February 3 and February 4 was roughly the same as the playback volume on January 29 and January 30, with data between 30,000 and 40,000.

By comparing the playback of “Liyuanchun” on iQiyi Video and Tencent Video from January 29 to February 4, 2016, it can be seen that there are some obvious commonalities in Figure 7, which are as: the number of views on February 1, 2016, whether it is iQiyi Video or Tencent Video, is the most viewed day in a week; the playback volume on February 2 was also lower than that on February 1, but higher than the other 5 days; compared with January 29 and January 30, the number of broadcasts on January 31 has a slight upward trend. And it can be seen from Figure 7 that since January 31, 2016, the playback volume of “Liyuanchun” had shown an upward trend on the whole, which showed that people’s attention to “Liyuanchun” was gradually increasing, and it had a certain connection with big data.

As we all know, if you want to study a TV program well, in addition to studying the TV program itself, it is not enough to study the audience. Because the audience plays an important role in the TV program, and to some extent determines whether the program can survive or not. Therefore, it is obviously not enough to only analyze the various data of the “Liyuanchun” column above. In order to comprehensively and deeply analyze and explore the survival status of traditional cultural TV programs in the

context of big data, this part also analyzed the audience behavior data of “Liyuanchun” in detail.

3.3. We-Media Opera User Behavior Data. This article counted and sorted out the user behavior data related to “Liyuanchun” on the iQiyi video network platform. Most of the viewers have a high school or technical secondary school education, accounting for 27%, followed by junior high school, accounting for 18.7%. It can be seen from the above data that the audience of “Liyuanchun” tends to be younger, and most of these audiences are male. Most of the viewers of the “Liyuanchun” column have lower education. People with junior high school and high school education prefer to watch “Liyuanchun,” while those with higher education are not very keen on watching “Liyuanchun”; and compared with PC terminals, viewers prefer to watch programs through mobile Internet terminals. Figure 8 shows the age distribution and educational level distribution of opera audiences on the iQiyi video platform.

Then, the user behavior data related to “Liyuanchun” on the Sina Weibo platform from January 28, 2016 to February 3, 2016 was counted. The popularity of Weibo and the geographical distribution of users are shown in Figure 9.

As shown in Figure 9, on the whole, the popularity index of “Liyuanchun” on the Sina Weibo platform on the mobile terminal was generally higher than that on the PC terminal. And whether it is on the mobile terminal or the PC terminal, compared with other days, January 31, February 1, and February 2 were the three days when “Liyuanchun” was highly discussed on Sina Weibo. In the mobile index, the index on February 1, 2016 was 2405, the highest in this time period, while in the PC index, the index on February 2, 2016 was the highest, at 467. The data showed that people are keen to pay attention to “Liyuanchun” and understand the program dynamics through mobile Internet terminals, as well as participate in related topic discussions.

In addition, this article also queried the geographical distribution of Sina Weibo users related to “Liyuanchun.” Among them, Henan Province has the highest degree of user participation in discussions, accounting for 75.81%, followed by Liaoning Province, accounting for 4.84%, and Zhejiang Province (3.23%). Hubei Province and Shandong Province have the same proportion, both 1.61%. From this, it can be seen that among the participants in discussions on topics related to “Liyuanchun” on the Sina Weibo platform, Henan Province has the most users, which is inseparable from the origin of “Liyuanchun” in Henan Province.

To sum up, by analyzing the data about user behavior, it is possible to better understand the habits and preferences of the audience. For example, when people watch a program in an online video, by analyzing the data, they can clearly understand which online video platform the audience likes to watch the program on, which part of the program skips over and does not watch, where there are traces of playback, what is the ratio of male to female viewers watching the program, the geographical distribution of the audience’s location, the hierarchical information of the audience’s age, etc. These user data are of great

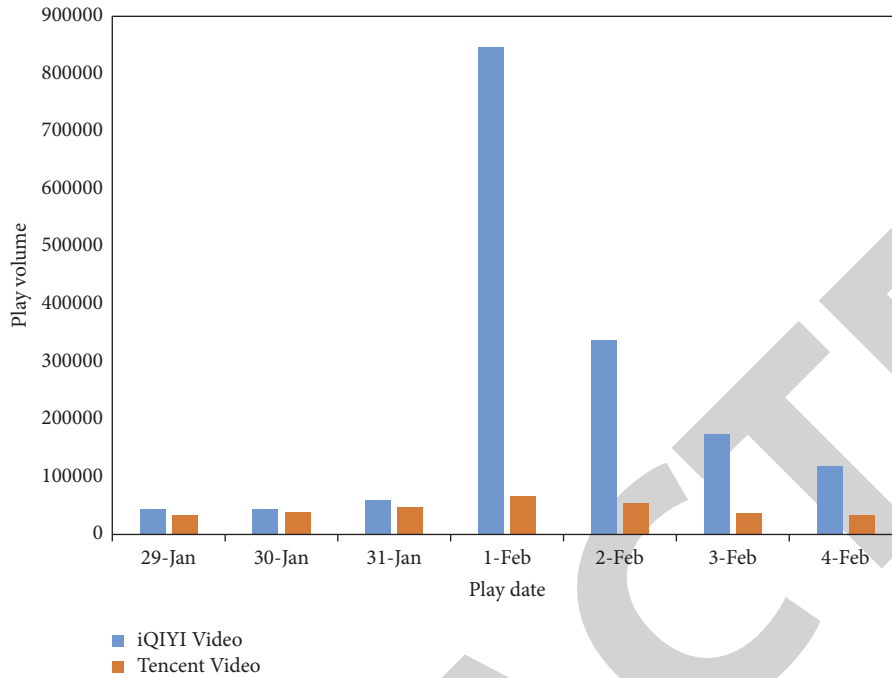


FIGURE 7: "Liyuanchun" video playback on Tencent and iQiyi.

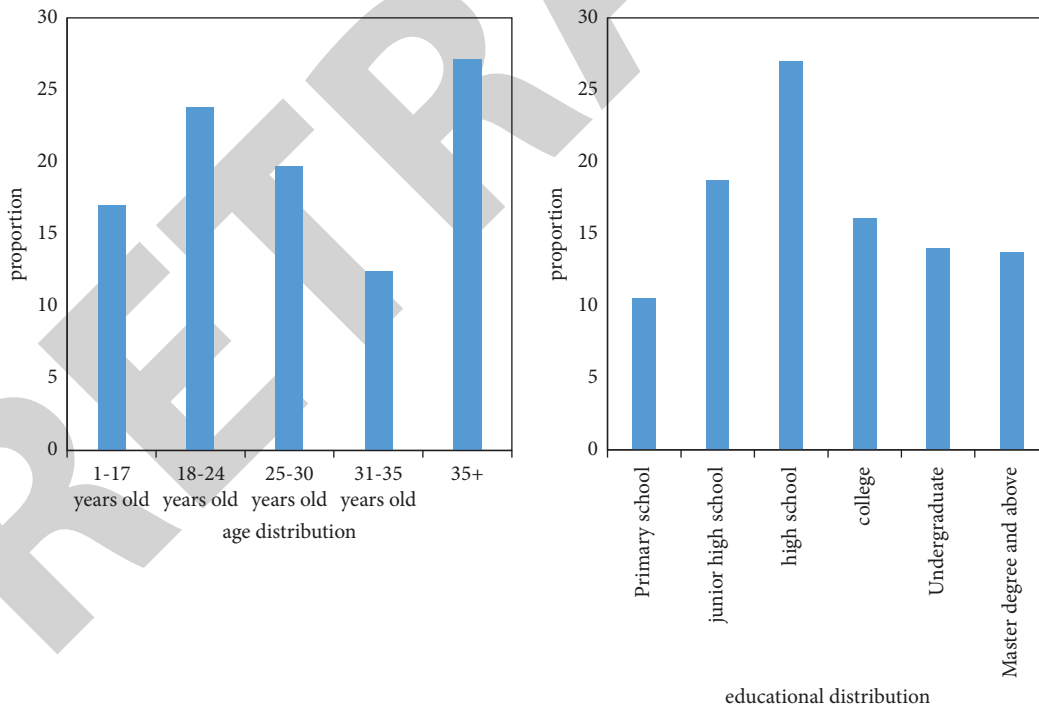


FIGURE 8: Age distribution and educational background distribution of opera audiences on iQiyi's video platform.

reference value to the program group. They are not only one of the reference standards for evaluating the quality of this program or the quality of production, but also provide some direction for the program group to produce programs in the future. Specifically, the column group can collect and organize user data generated by various platforms. By

analyzing and integrating data, we can study the daily interests and hobbies of users and audiences, so as to produce programs according to the audience's preferences. This not only helps to improve and perfect the production of the program, but also helps to promote the long-term development of the program.

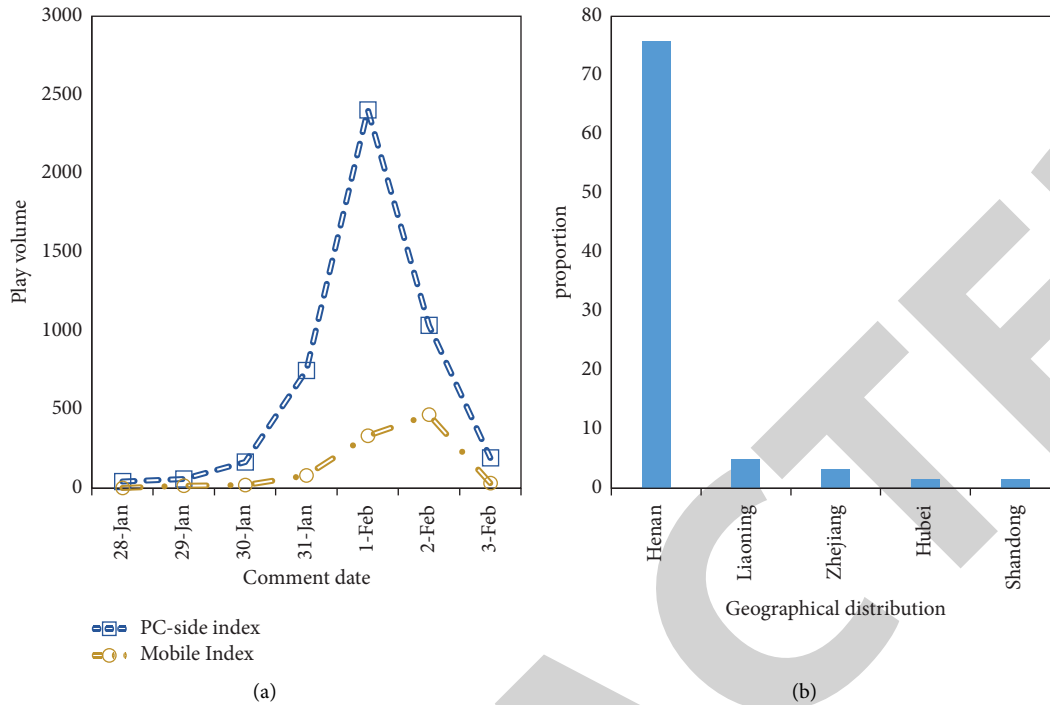


FIGURE 9: Weibo popularity (a) and geographical distribution of users (b).

TABLE 1: Overall network correlation matrix of 10 opera categories.

	Peking opera	Henan opera	Yue opera	Qin opera	Pingju	Opera	Lu opera	Kunqu opera	Overtone
Peking opera	10	10	8	10	7	3	1	2	3
Henan opera	4	10	3	5	5	5	3	0	3
Yue opera	5	6	10	6	5	6	4	3	3
Yellow plum	4	7	7	1	5	4	3	0	0
Qin opera	7	8	3	10	4	4	2	1	5
Pingju	4	6	4	6	10	4	2	1	0
Opera	1	8	1	3	2	10	6	0	0
Lu opera	2	6	3	3	6	5	10	0	0
Kunqu opera	10	4	8	4	3	3	0	10	0
Overtone	6	7	4	2	0	5	0	0	10

3.4. *Correlation between Operas and the Popularity of Communication.* First, web crawlers were used to crawl the data of 10 traditional Chinese opera categories in Shpinxiqu.com. Next, it was sorted according to the amount of play, and the top 10 tracks of each genre and their play amount were selected. Then, the Internet correlation between the koji types was quantified. Finally, the Internet correlation between songs and the popularity of Internet communication was fitted. Table 1 shows the overall network correlation matrix of 10 opera categories.

If song A and song B have audio or video transmission of song A on the Internet at the same time, it is considered that for song A , song A and song B have some kind of Internet relevance, and the degree of association is set to 1, otherwise, it is 0. As shown in Table 1, the overall correlation degree was obtained by accumulating the correlation degrees of the top 10 tracks of each genre. The Internet popularity of songs was measured by the cumulative relative on-demand volume of

the top 10 songs. Figure 10 shows the relationship between the total number of songs, the weighted correlation degree, and the playing popularity.

As shown in Figure 10, the positive correlation between the degree of association and the degree of spread was strengthened after considering the weight of the playback volume. In general, the higher the degree of correlation with other koji, the higher the spread of koji also tends to be. Sichuan Opera and Qin Opera were taken as examples, the top 10 pieces of Qin Opera had a much more complex network of associations than Sichuan Opera, and the average popularity of the former on opera websites was also much higher than that of the latter.

3.5. *BDA of Opera Performance on Popular Music Platforms.* Through the Internet popular music platform NetEase Cloud Music, data mining was carried out on the most

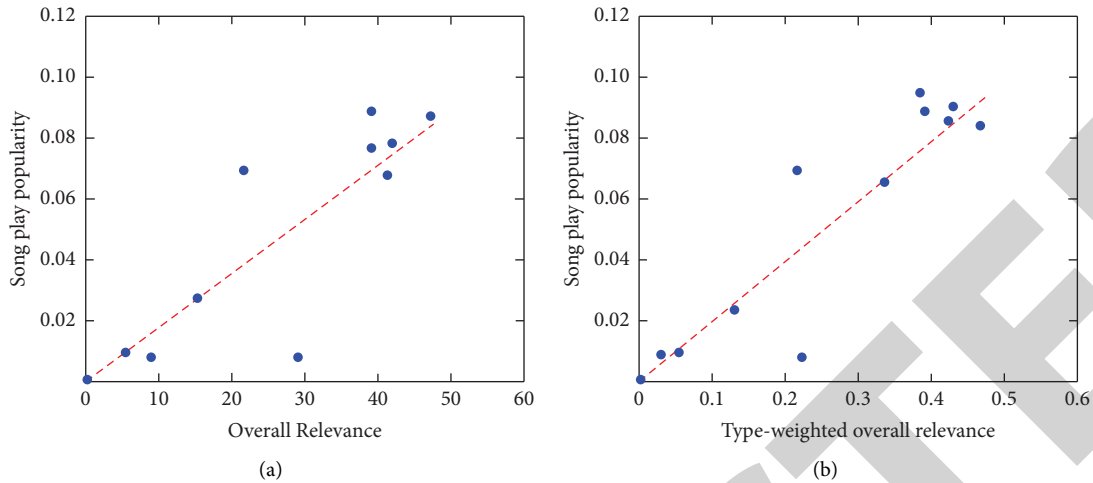


FIGURE 10: The overall music genre and the relationship between weighted relevance and playback popularity.

TABLE 2: NetEase cloud music's five opera categories and pop music chart statistics.

Koji	Number of tracks	Highest number of comments	Average number of comments
Peking opera	197	3673	235
Henan opera	73	1018	151
Yue opera	198	2469	64
Sichuan opera	9	87	42
Qin opera	116	48257	1758
NetEase cloud top songs chart	200	395969	90157

influential opera genres in China—Peking Opera, Henan Opera, Yue Opera, and the most representative genres in western China—Sichuan Opera and Qin Opera. First, the five selected opera genres and the NetEase Cloud Music pop song list were retrieved, and then irrelevant information was filtered out. Table 2 shows the five opera categories of NetEase Cloud Music and the statistics of popular music charts.

As shown in Table 2, it can be seen that the five major opera categories had a huge gap in the popularity of reviews compared to popular pop music. At the same time, the data also showed that Qin Opera had a significant advantage over the other four traditional operas in terms of comment popularity. Among the popular songs with more than 4,000 comments, there were 194 songs on the pop song chart, 13 songs in the Qin Opera category, and none of the other four opera categories had more than 4,000 comments.

4. Conclusions

With the continuous development and progress of Internet technology, network communication will inevitably become an important way for the dissemination of opera music in the Internet+ era. Compared with other media, the audience media of the Internet is relatively more. Therefore, the dissemination of opera music through the Internet will inevitably increase the audience of opera music, which is undoubtedly a good news for the dissemination of opera music. In an information age, the development and dissemination of opera music need to

seize the opportunity of this era and combine the development of opera music with the Internet+ era. Opera music is the cultural crystallization of the Chinese nation's thousands of years of history. In the process of historical development, the content and form of opera music have undergone great changes, and its transmission method has also gotten rid of the traditional way of word of mouth. Entering the Internet+ era, the social dissemination of opera music breaks the time and space limitations of traditional dissemination methods. With the increasingly younger Internet groups, the audience of opera is also becoming younger, which is of great significance to the widespread dissemination and vigorous promotion of opera culture. There is a major deviation in the current government's policy on the inheritance and development of opera. From the national to local research, decision-making and even policy level, the relationship between the inheritance of opera culture and the information society ecology has not been fully recognized, and all policies are still limited to the protection and support of opera and are weaker than inheritance and development.

Data Availability

This article does not cover data research. No data were used to support this study.

Conflicts of Interest

The author declares no conflicts of interest.

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