Smartization Mechanism of Music Inheritance of Bourau in Guangxi under the Background of Intangible Cultural Heritage Protection

Ling Tang[a,*], Weijie Fan[b]

College of the Arts, Guangxi Minzu University, Nanning, Guangxi, 530001, China
[a]tangling@gxmzu.edu.cn, [b]2099145379@qq.com
[*]Corresponding author

Abstract: The use of smartization mechanism has become a hot issue in the study of the protection and transmission of Intangible Cultural Heritage (ICH) in China. In this paper, we take the traditional culture of the Bourau in Guangxi as the research object, and study the "smartization" mechanism of its generation. After a comparative analysis, it was found that the smart mechanism had a significant benefit in enhancing the inheritance effect: the average time required for students to become proficient in the copper drum technique was 52.1 days under the smart approach, compared to 94.8 days under the face-to-face teaching approach. In addition, the smartization mechanism also shows great potential in expanding the scope of audience, and the smartization mechanism can not only enhance the inheritance efficiency of Bourau music, but also allow more people to participate in this activity. Through these studies, it is expected to provide more in-depth insights and strategies for the smartization transmission of Bourau music and other intangible cultural heritage.

1. Introduction

In today's global economic integration, the effective protection and inheritance of China's intangible cultural heritage has become a common concern of the international community. The Bourau music in Guangxi, with both rich historical information and obvious national characteristics, is one of the most representative ethnic groups in China. However, with the rapid development of modern society, the development of Bourau music can no longer meet the requirements of the times, and is in urgent need of a breakthrough development. At present, the research on "intangible cultural heritage" focuses on the "material" aspect, and there is a lack of research on the "smart" inheritance mechanism. Smartization mechanisms represented by digital technology, online education platforms and social media provide a new way of safeguarding ICH, which can not only increase the visibility of ICH, but also inspire more youth to participate and communicate with each other, thus injecting new vitality into the safeguarding of ICH.

This paper mainly starts from the folk music of Bourau in Guangxi, and discusses this issue from

both theoretical and practical aspects. This paper aims to analyze the current situation of the development of Bourau modern music, find its problems, and deal with them smartization ly in order to better inherit the Bourau music. Through empirical research, this paper collects and analyzes relevant data, including the number of Bourau music learners, their participation, learning efficiency, and audience scope, in order to assess the actual effect of the smartization mechanism.

2. Related Works

The safeguarding and transmission of intangible cultural heritage is an important element in maintaining cultural diversity worldwide. In the music world, especially the inheritance and development of national folk songs have always been generally emphasized by the academic and practical circles. In recent years, many scholars have conducted a relatively comprehensive discussion on folk music education in Chinese universities from different perspectives, and explored how to organically integrate folk music with modern education methods. Sun et al. conducted a deep study on Chaohu folk songs, hoping to provide a new thinking for the inheritance and development of modern folk music in the modern education system [1]. Mao's research found that college music education played an irreplaceable role in the inheritance and development of folk music [2]. Tang conducted a field survey on the teaching of ethnic vocal music in Guangxi and conducted an empirical study on the education of ethnic music in Guangxi [3]. Qingchuan took Peking Opera as an example to explore the inheritance and protection methods of local opera [4]. Liu et al. conducted some discussions on the application of Guangxi Zhuang's traditional culture in contemporary Zhuang singing art [5]. Wu and Boonsrianun revealed the role of ethnic festivals in the transmission of music culture by studying the transmission of Bourau folk songs during the Walking Slope Festival in Mulao Autonomous County of Luocheng [6]. Kang explored strategies for the promotion and transmission of ethnic music based on the perspective of intangible cultural heritage [7]. Gwerevende and Mthombeni, on the other hand, explored the synergistic role of aboriginal languages, dances and musical practices in the transmission of intangible cultural heritage from a South African perspective [8]. Liao X et al, as well as Wei and Gao, studied the management mechanism of inheritors of intangible cultural heritage of music and the protection strategies of traditional ethnic music culture from the perspectives of Hunan and Shanxi, respectively [9-10].

Although existing studies have accumulated rich theoretical foundations and practical cases in this area, they still leave much to be desired in terms of the study of the mechanism of intelligibility in Bourau folk songs, especially in Guangxi folk songs. Most of the existing studies focus on the study of single cultural factors, while there are fewer studies on their use and assessment. For this reason, this paper will be based on Bourau music in Guangxi and use it as a breakthrough to explore the mechanism of wisdom-based transmission. The results of this study can provide strategic references for the inheritance and development of Bourau music in Guangxi, which is of great practical value for the protection and inheritance of China's "intangible cultural heritage".

3. Methods

3.1 Data Collection Methods

In this paper, semi-structured interviews will be conducted to understand the current status of the inheritance of Bourau music, challenges and opportunities through in-depth interviews with the inheritors of Bourau music, music scholars, educators, government officials and people from all walks of life. This paper takes the traditional culture of the Bourau as the research object, and through online surveys, we understand the folk's knowledge, attitude and intention to participate in

the traditional culture. At the same time, we use tools such as Brandwatch and Hootsuite to discuss and share topics related to Bourau music in the social media, in order to grasp the level of public attention and participation.

The sample selection in this paper follows the principle of diversity, and seeks to reflect the comprehensive evaluation of Guangxi at all levels and by all subjects of interest as a whole. A representative sample of people, including inheritors, scholars, educators, policy makers and the general public, was selected based on geography, age, gender, occupation and level of commitment to Bourau music. Survey respondents came from different cultural festivals, music schools, community centers, online forums and social media platforms. In this paper, 50 Bourau music inheritors of different ages, genders, and occupations will be selected, as well as 100 members of the general public, with varying degrees of relationship and participation in the transmission of Bourau music. Each participant's personal data, including age, gender, occupation, and education, will be recorded in detail [11-12].

3.2 Data Coding and Analysis

The process of coding and parsing data aims to transform qualitative and quantitative data into a format that can be studied in depth. This paper will define and categorize the qualitative materials such as recorded interviews and open-ended questionnaires. To obtain open-ended codes, the data will first be further subdivided and categorized into larger themes by master codes. The selection of codes will enable better extraction of core areas and ensure the center and depth of the findings. The quality of the acquired images is improved by constructing and parsing them using a variety of qualitative analyses such as NVivo and ATLAS.ti. The qualitative data are then presented in a narrative form, giving a complete picture of the various levels of Bourau, by theme, trend and type. For quantitative data, descriptive statistical analysis is used to give information such as the mean, standard deviation, and frequency of the data. Based on the above analysis, t-test and ANOVA were used to test the significant differences between the variables. The linear correlation between the variables was correlated using Pearson's correlation coefficient, and Pearson's correlation coefficient (r) was calculated as:

$$r = \frac{\sum(X_i - \overline{X})(Y_i - \overline{Y})}{\sqrt{\sum(X_i - \overline{X})^2 \sum(Y_i - \overline{Y})^2}}$$

(1)

Where X_i and Y_i represent each pair of observations, and $\overline{X}$ and $\overline{Y}$ represent the mean values of the variables X and Y, respectively. When the value of r is close to +1 or -1, it means that there is a strong linear relationship between the variables, and when the value of r is close to 0, it means that there is almost no linear relationship.

3.3 Assessment Framework for Smartization Mechanism

Today, in the development of digital economy, the protection of intangible cultural heritage in China has encountered unprecedented opportunities and challenges. Bourau music in Guangxi is a valuable national tradition, and its inheritance methods must keep pace with the times to better meet contemporary needs [13-14]. This paper takes Bourau music in Guangxi as the research object to improve its inheritance effectiveness and expand its dissemination object. The specific content of the framework is shown in Figure 1:
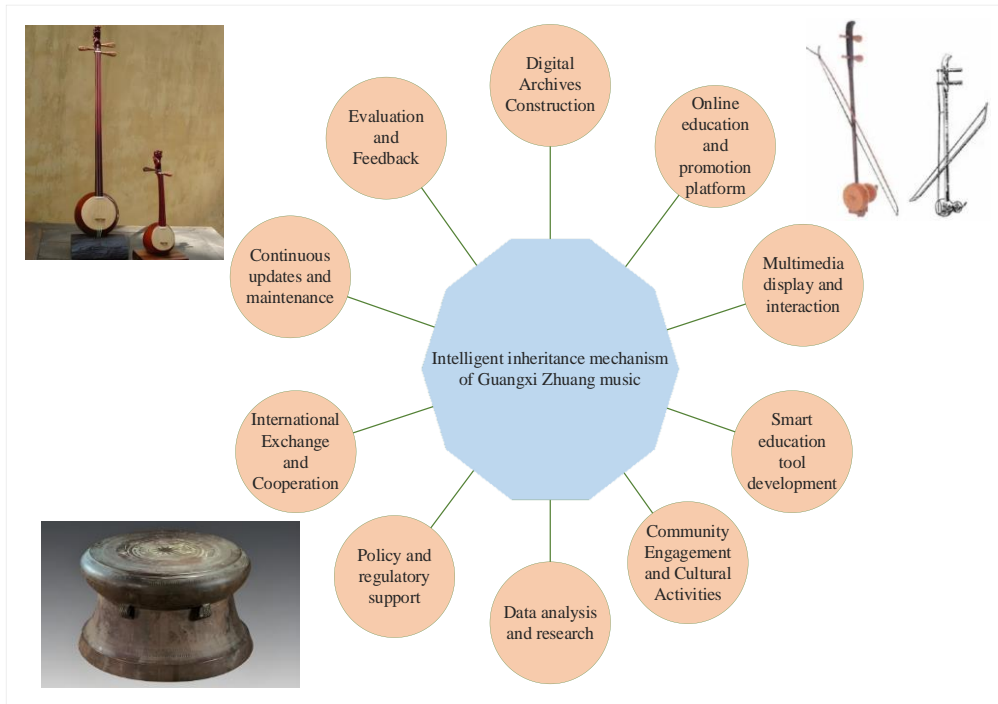
Figure 1: Smartization inheritance mechanism of Bourau music in Guangxi

The smartization inheritance mechanism of the Bourau in Guangxi is a brand-new model that integrates modern information technology into traditional music culture so as to achieve better preservation and inheritance. Firstly, using the established digital archive, the historical Bourau audio, video, lyrics, sheet music and other materials will be converted into easily accessible digital files for researchers and the general public. Secondly, this paper will establish an online teaching platform to bring more interaction and community communication for students to experience and learn Bourau music in depth at any location. Through the use of multimedia, virtual reality and augmented reality, it creates an immersive musical experience that modernizes and supports traditional Chinese culture. At the same time, the social media and offline methods are used to enhance the residents' sense of participation and identity, and to promote the social participation and cultural activities of community residents. The dissection and study of the data will enable the researcher to better understand the influence of traditional culture on corporate culture and then revise the strategy of the company. The government's support has laid a good foundation for the wise inheritance of the Bourau culture, and at the same time, through foreign exchanges and cooperation, it has also spread the Bourau music around the world, expanding its influence in the international arena. The continuous updating, maintenance and evaluation of the heritage ensure the long-term operation and continuous optimization of the system. Based on this, the Bourau music of Guangxi can be inherited and carried forward on a national scale, and at the same time show its unique artistic charm and value to the world [15-16].

4. Results and Discussion

4.1 Experimental Setting

This paper compares the data of the experimental subjects and the control subjects to evaluate the effectiveness of their intelligent inheritance mechanism. The control group is taught in the traditional Bourau music method widely used today, mainly face-to-face teaching, master-apprentice teaching, community activities and live concerts. The number of participants,

geographical distribution and music learning progress of participating students were counted. At the same time, a variety of scientific and technological means such as virtual reality teaching, online teaching platform, and social media interaction will be integrated to construct a complete intelligent inheritance system. The experiment will last for one year, divided into four phases, with data collected at the end of each phase. Finally, by comparing the information of the two groups, the role of the smartization inheritance mechanism in improving the inheritance efficiency, expanding the audience scope and enhancing the participating population will be explored.

4.2 Inheritance Efficiency

While exploring the mechanism of smartization inheritance of Bourau music in Guangxi, we also collected and analyzed the effectiveness of various inheritance methods. This paper selected 150 volunteers to learn the bronze drum, Tianqin, and Huluhu instruments. For each type of musical instrument, 50 people were arranged to learn, and these 50 people were divided into 10 groups, with 5 people in each group learning through the methods of face-to-face teaching, master-apprentice teaching, community activities, live concerts, and smartization mechanism, so as to collect data on the time they spent mastering the skills of the basic musical instruments, of which the time data of the brass drums are shown in Figure 2:
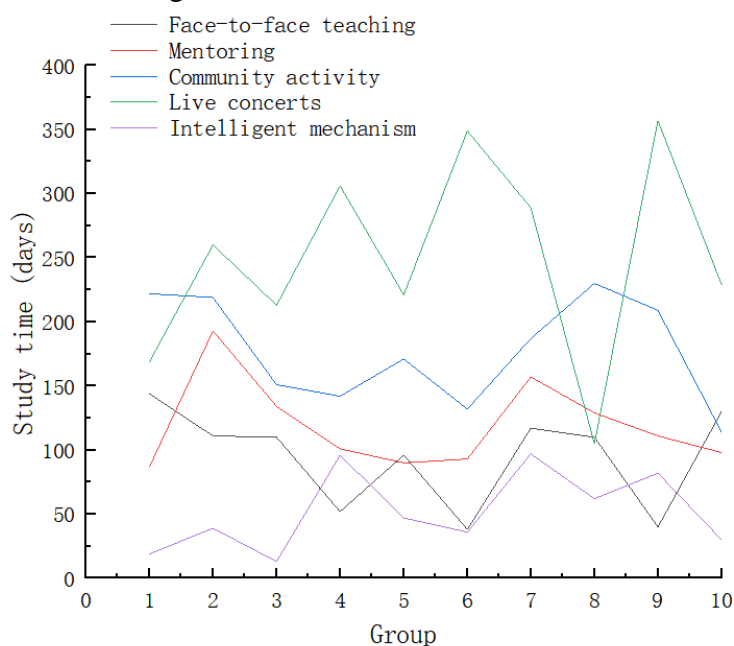

Figure 2: Bronze drum learning time

From the data in Figure 2, it can be found that in the 10 groups of learners' bronze drum learning time data, overall learners under the smartization mechanism can master the bronze drum skills in a shorter period of time, while learners under the live concerts and community activities need a longer time to master the bronze drum learning, and learners under the smartization mechanism can have a higher bronze drum learning efficiency. Specifically, learners under the smartization mechanism are able to master the skill of playing the brass drum in an average of 52.1 days, while the fastest way to master the skill of playing the brass drum in the traditional method is face-to-face teaching, but the average learning time of learners under the face-to-face teaching method also still reach 94.8 days, which is an average of 42.7 days longer than that of the smartization mechanism. This can reflect that the application of the smartization mechanism can improve the efficiency of learners' learning of the copper drum, and the smartization mechanism makes it possible for learners to

achieve the same learning effect in a shorter period of time by providing a more flexible and interactive way of learning. In addition to the learning of the copper drum, the ethnic musical instruments of the Bourau people also include the Tianqin and the Huluhu. Figure 3 shows the specific time data of learners learning the Tianqin, and Figure 4 shows the time data of learners learning the Huluhu:
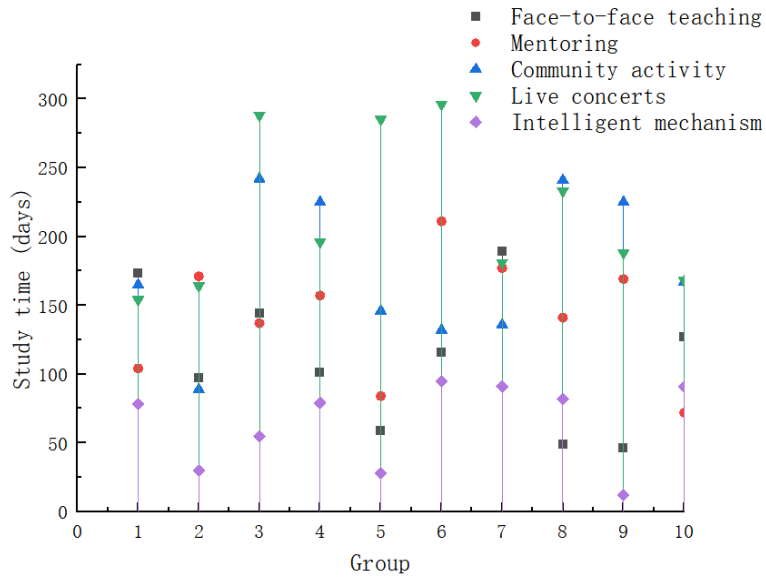

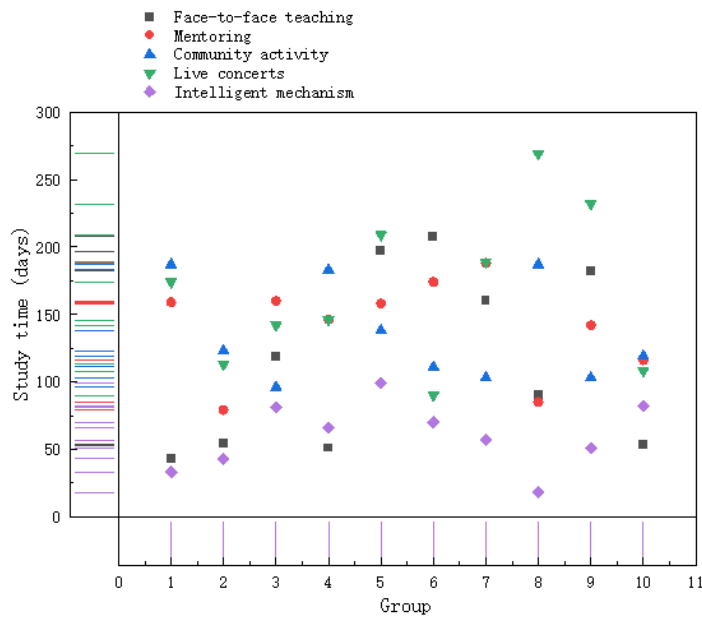Figure 3: Learning time of Tianqin

Figure 4: Learning time of Huluhu

From the data in Figures 3 and 4, it can be found that the time for learners to learn the Tianqin and Huluhu under the smartization mechanism is also shorter than other traditional methods, and learners are able to master the basic skills in a shorter period of time. In addition, it can be found that in the learning process of Tianqin, learners can master the skills in 12 days at the earliest, while the fastest mastery of playing skills in the traditional method is the learners under the face-to-face teaching method, but the fastest mastery takes 46 days. It takes much longer to learn compared to an

intelligent system, which means it is less efficient. The intelligent mechanism can help learners to master the basic skills of both instruments more quickly, thus improving their learning efficiency.

4.3 Audience Scope and Activity Participation

In order to comprehensively assess the effectiveness of the smartization mechanism in the transmission of Bourau music in Guangxi, this paper collects and analyzes two sets of key data: the number of activity participants and the scope of audience. Table 1 presents the number of learners who participated in Bourau music activities through several methods: face-to-face teaching, master-apprentice teaching, community activities, live concerts, and the smartization mechanism. From Phase 1 to Phase 4, the data shows trends in participation over time for each method.

Table 1: Number of participants in the event

Method	Phase 1 (number of people)	Phase 2 (number of people)	Phase 3 (number of people)	Phase 4 (number of people)
Face-to-face teaching	54	61	69	81
Mentoring	18	24	29	35
Community activity	84	96	105	110
Live concerts	304	367	440	460
Intelligent mechanism	547	791	948	1286

From Table 1, this paper clearly shows that the number of participants in different types of transmission methods has shown signs of increasing. In particular, the number of participants in the smartization mechanism has increased dramatically from 547 in the first stage to 1,286 in the fourth stage. This jump reflects the great potential of the smartization mechanism in expanding the audience of Bourau music transmission. Through modern technological means such as online platforms and virtual reality teaching, the smartization mechanism breaks through the geographical limitations and brings richer learning experiences to students. This paper analyzes the audience scope of the number of people in the fourth stage, and Table 2 shows the participation of audiences from different backgrounds according to the dimensions of age and geography.

Table 2: Audience range

Background	Audience	Face-to-face teaching	Mentoring	Community activity	Live concerts	Intelligent mechanism
Age	Under 18 years old	14	8	29	144	367
	18-35 years old	52	17	45	191	489
	35-50 years old	11	9	17	91	281
	Over 50 years old	4	1	19	34	149
Area	Local resident	68	30	96	385	794
	Foreign tourists	13	5	14	75	492

In terms of different age groups, the audiences of face-to-face teaching, master-apprentice teaching, community events, live concerts and smart mechanisms are all concentrated in the 18-35 age group, but the smart mechanisms also have a significant proportion of people over 50 years old,

with 149 people over 50 years old participating in the activities. Across all heritage methods, local residents were generally more engaged than out-of-town visitors. In particular, the number of participants in the live concerts and the smartization mechanism was 385 and 794 respectively, showing the strong interest and willingness of local residents to participate in the Bourau music heritage activities. Although the overall participation is lower than that of local residents, the smartization mechanism still attracts a large number of foreign tourists, with the number of participants reaching 492. To a certain extent, this reflects that the smartization mechanism can effectively attract foreign audiences, break through the geographical limitations, and provide a broader space for the dissemination of Bourau music.

5. Conclusion

Through a comprehensive study of the use of smartization mechanism in Bourau music heritage of Guangxi, it is found that the smartization mechanism can significantly improve the dissemination efficiency of Bourau music, broaden its audience scope, and enhance its participation for young people and foreign tourists. In particular, under the intelligentized learning method, learners show higher learning efficiency in learning instruments such as copper drum, Tianqin and Hulu, which has significant advantages in shortening the learning time and increasing the number of participants compared with traditional face-to-face teaching, teacher-apprentice teaching, community activities and live concerts. The results of the study show that the system not only attracts the local people, but also attracts foreign tourists and young people, opening up a new path for the inheritance and development of Bourau music. Although the results of this paper show that the smartization mechanism has a positive role in the inheritance of Bourau music, there is still room for further exploration. Future research will further explore the smartization mechanism of Bourau music in modern society, and convey it at a deeper level to the cultural heritage and spirit it contains.

Acknowledgements

References

[1] Sun Dinghai, Chen Minyan, Wu Wei. A study on the practical path of integrating Chaohu folk songs into vocal music teaching in colleges and universities[J]. Journal of Chaohu University, 2024, 25(5): 158-164.
[2] Mao Wei. Music education in colleges and universities and the inheritance of national music culture[J]. Contemporary Music, 2022 (6): 18-20.
[3] Tang L. Practical Investigation on Guangxi Ethnic Vocal Music Teaching under the Background of Intangible Cultural Heritage Protection Wisdom[J]. Art and Performance Letters, 2023, 4(7): 101-107.
[4] Qingchuan Z. Exploration of the Inheritance and Protection Ways of Local Drama—Take the Jinghe Opera as an Example [J]. Art and Performance Letters, 2024, 5(2): 62-70.
[5] Liu J, Maneewattana C, Lingling L. The Application of Guangxi Zhuang Elements in Contemporary Zhuang Vocal Music Works [J]. RES MILITARIS, 2023, 13(3): 427-438.
[6] Wu Y, Boonsrianun P. Literacy Transmission of Mulao Folk Songs during the Zoupo Festival in Luocheng, Guangxi Zhuang Autonomous Region, China[J]. International Journal of Education and Literacy Studies, 2023, 11(3): 208-216.
[7] Kang L. National music promotion and inheritance strategies based on the perspective of intangible cultural heritage [J]. Arts Studies and Criticism, 2022, 2(4): 197-200.
[8] Gwerevende S, Mthombeni Z M. Safeguarding intangible cultural heritage: exploring the synergies in the transmission of Indigenous languages, dance and music practices in Southern Africa[J]. International Journal of

Heritage Studies, 2023, 29(5): 398-412.

[9] Liao X, Li C, Zhu L. Management mechanism for safeguarding of musical intangible cultural heritage inheritors in Hunan, China [J]. AU-GSB e-JOURNAL, 2022, 15(1): 118-124.

[10] Wei Y, Gao Y. Research on the Protection Strategy of Traditional Culture of National Music in Shanxi Province from the Perspective of Intangible Cultural Heritage[J]. Journal of Education and Educational Research, 2023, 5(2): 36-39.

[11] Shang Y, Kantasiri K. Research on the Protection of Intangible Cultural Heritage of Changde Area Opera[J]. Journal of Survey in Fisheries Sciences, 2023, 10(2S): 2202-2213.

[12] Liu W. Literature survey of multi-track music generation model based on generative confrontation network in intelligent composition[J]. The Journal of Supercomputing, 2023, 79(6): 6560-6582.

[13] Qian K, Schuller B W, Guan X, et al. Intelligent music intervention for mental disorders: insights and perspectives[J]. IEEE Transactions on Computational Social Systems, 2023, 10(1): 2-9.

[14] Ye J. The application of artificial intelligence technologies in digital humanities: Applying to Dunhuang culture inheritance, development, and innovation[J]. Journal of Computer Science and Technology Studies, 2022, 4(2): 31-38.

[15] Kim S, Andersen K N, Lee J. Platform government in the era of smart technology[J]. Public Administration Review, 2022, 82(2): 362-368.

[16] Agarwal P, Swami S, Malhotra S K. Artificial intelligence adoption in the post COVID-19 new-normal and role of smart technologies in transforming business: a review[J]. Journal of Science and Technology Policy Management, 2024, 15(3): 506-529.