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Article

Research on the Sustainable Development Strategies of Traditional Suona Ensembles in the Digital Era

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Abstract

Natural landscape is limited, while human creation is infinite. Cultural resources provide the richest, deepest and most attractive elements for the development of Chinese civilization. This study uses the Cuijia Suona ensemble as a case to deeply analyze the sustainable development strategies adopted by traditional suona ensembles in the digital era. It explores how these strategies reflect the principles of sustainable development. Through research and interviews with the Cuijia Suona, this study discusses the market changes and cultural transmission challenges faced by traditional suona music in the digital age and analyzes how suona music achieves sustainable development through strategies such as online dissemination, virtual performances, and digital training. In the new digital era, we should make full use of advanced technology to explore, protect, inherit and develop tangible cultural resources and intangible cultural heritage.

Keywords: Suona music; digitization; sustainable development

1. Introduction

The suona is a double-reed wind instrument with a long history and profound cultural connotations. It can be played solo or in combination with other instruments. As one of China's traditional instruments, it is widely used in various folk activities and festive ceremonies, with unique cultural charm and artistic value, making it an indispensable part of folk music (Yang, 2024). With the development and popularization of digital technology, the methods of dissemination and inheritance of traditional music culture are undergoing significant changes (Wang & Xu, 2024). Digitalization has brought new avenues and ways for music dissemination, but it also poses new challenges for traditional suona ensembles. These changes not only affect the dissemination methods of suona music but also impact its audience.

In the digital era, the primary challenge faced by suona ensembles is how to adapt to new methods of music dissemination and transmission while maintaining the uniqueness and sustainable development of their traditional culture (Wang & Xu, 2024). The opportunities brought by digitization include online music dissemination, virtual performances, and broader audience coverage. However, how effective these opportunities are and how suona ensembles can find development

strategies suitable for themselves in the digital environment are issues that require in-depth discussion.

This study aims to analyze and explore the sustainable development strategies of traditional suona ensembles in the digital era, focusing on how these strategies address the challenges brought by the digital age. By integrating the principles of sustainable development, this paper provides targeted strategic recommendations to promote the transmission and innovative development of suona music.

2. Sustainable Development in the Digital Era

2.1. Sustainable Development Theory

Cultural diversity and transmission are key factors in the theory of cultural sustainability, as they promote the long-term stability and growth of cultural development. Protecting cultural diversity ensures the richness of human cultural heritage and promotes mutual understanding and respect among cultures (Bali Swain & Yang-Wallentin, 2020). When studying cultural construction, such as traditional craftsmanship, sustainable development is promoted by strengthening cultural heritage and driving local economic growth (Zhang et al., 2021). This approach can also be applied to the field of music culture. As part of cultural heritage, the protection and transmission of traditional music have a unique role in sustainable development. The suona, as an important traditional instrument, embodies the diversity and richness of Chinese culture. By exploring and promoting suona culture, this musical form can remain vibrant in the age of globalization and digitalization. The transmission of the suona not only contributes to the protection of cultural diversity but also helps cultivate new audiences, thereby achieving sustainable development.

Innovation and integration play critical roles in cultural sustainability. Through effective management, innovation and integration can make the practice of music sustainable by meeting social and economic needs (Elmo et al., 2020). In suona music, innovation and integration are reflected in the combination of traditional suona with modern music or the use of digital technology to innovate performance formats. For example, integrating suona with pop music or using modern technology to enrich the artistic expression of the suona can broaden its audience and enhance its influence in modern society. Innovation and integration inject new vitality into traditional culture, helping it adapt to the developments and changes in modern society.

At present, it is an era of AI. Artificial intelligence technology can not only help improve the design and production of suona through data analysis and algorithm optimization. Moreover, it also played an important role in the teaching and inheritance of suona. The inheritance of traditional culture requires not only time and energy, but also tools. In recent years, with the development of science and technology, AI technology has been applied by more and more artists. In the future, the sustainable development of suona also needs to think about how to use modern technology to further promote cultural inheritance. We hope that with the help of emerging technologies such as AI, they can inject new creative elements into traditional art and help it move towards a broader stage.

2.2. Digital Transformation

Impact of digitization on suona music. Digitization has had a profound impact on traditional music, especially in the music industry, where digital technology has changed its business model (Lee & Lee, 2020). In the field of suona music, digitization has injected new vitality into its business model, allowing suona ensembles to showcase their works through social media, streaming platforms, and short video platforms. This provides traditional music groups with extensive dissemination channels and audience groups.

Changes in music creation and dissemination methods. Digital technology has injected fresh blood into traditional culture in terms of music creation and dissemination (Wang, 2023; Li, 2023).

According to Boudreault-Fournier (Diamanti & Boudreault-Fournier, 2021), digital media infrastructure has brought new forms of music production and dissemination. In suona music, digital technology helps suona ensembles achieve more flexible and diversified performance modes in live streaming, recording, and music video production, breaking the limitations of time and space. Digital technology also provides suona ensembles with virtual concerts. This method attracts more young audiences, and online performances can increase the market acceptance of music.

Digital archives and cultural preservation. Digital archives, as an important tool for recording and preserving traditional culture, can become a vital means of transmission for suona music. Using digital archives to record and disseminate suona performance techniques and repertoires ensures its preservation.

Digitization promotes cultural exchange and interaction, enabling suona ensembles to promote their music globally and interact with different cultures. Digital platforms provide a stage for suona music to showcase its unique cultural charm, promoting cultural diversity and inclusivity.

3. Research on the Current Situation of Cuijia Suona

This study adopts a case study method to explore the sustainable development strategies of the Cuijia Suona ensemble in the digital era. The choice of Cuijia Suona as a research case is based on several reasons: the ensemble is a city-level intangible cultural heritage group that has performed in places like Korea, giving it a certain level of representativeness. Additionally, Cuijia Suona's leader, Cui Shiguang, an inheritor of intangible cultural heritage, has actively experimented with integrating traditional music with digital technology for many years, providing valuable experience in the application of digital strategies. Furthermore, Cuijia Suona has established close connections with other folk groups, schools, and scholars. Cui Shiguang is not only an inheritor of intangible cultural heritage but also a teacher, with students spread across the country, including suona principals in opera theaters and university professors. Therefore, choosing Cuijia Suona as the research subject allows for a multidimensional presentation of the impact of digitization on suona music. It also provides a deeper understanding of how digital strategies help suona ensembles overcome challenges and achieve sustainable development, offering insights for other traditional cultural groups.

The data was collected through qualitative, semi-structured interviews and focused on three main aspects: the application of digital strategies, the challenges of development and transmission, and future development directions. The interview subjects included Cui Shiguang, inheritor of Feixian suona, members of the suona ensemble, leaders of other suona groups, and scholars. Their insights on the implementation of digital strategies and suona cultural transmission were organized and analyzed. The main interview topics included:

Application of digital strategies: How Cui Shiguang and his team implement online promotion and digital music development strategies;

Development challenges and transmission issues: The main challenges faced by suona groups, including resource constraints and transmission difficulties;

Future development directions: Expectations and suggestions on how suona groups can continue to develop digital strategies.

The data was organized and classified using thematic analysis methods. The views of the interviewees were analyzed according to the themes presented in Table 1, summarizing their comprehensive views on suona cultural transmission, digital strategies, and future development. Qualitative methods are used in the analysis.

Table 1. Thematic analysis of interview data.

Data Category	ID	Data Source	Description	Key Issue	Notes/Comments
Interview Data	I1	Interview—Cui Shiguang	Application of digital strategies	What strategies were applied in the digital transformation?	Mainly live streaming and social media promotion
Interview Data	I2	Interview—Team Members	Development and transmission issues	What difficulties and challenges were encountered in the transmission of traditional culture?	Lack of interaction in online dissemination; complex performance techniques are difficult to teach
Interview Data	I3	Interview—Other Suona Ensemble Leaders	Combination of tradition and modernity	How do you view the combination of traditional and modern music?	Traditional styles should be preserved, but innovation is necessary
Interview Data	I4	Interview—Scholars	Future development directions	What is the development direction of suona culture in the digital age?	A combination of online and offline, focusing on cultural transmission

The findings indicate that digitization plays a key role in the sustainable development of traditional culture. The research reveals that digitization can help suona music break through the geographical and temporal limitations of traditional performances, effectively expanding the audience base. Online comments also increase interaction. Additionally, digital strategies have promoted new business models and revenue streams, such as virtual performances and digital music sales, which are crucial factors for the sustainable development of traditional suona ensembles.

The data collected from semi-structured interviews demonstrate that digitization is not only a technological application but also an innovation in culture and business strategy. It provides new momentum for the transmission of traditional culture, allowing suona music to better adapt to the needs of modern society while maintaining its unique cultural characteristics and sustainability.

4. Implementation of Digital Strategies

In the context of the digital era, Cuijia Suona has experienced significant changes in market dynamics and audience behavior. Cuijia Suona's performances were primarily dependent on traditional folk and festive activities such as weddings, funerals, and opening ceremonies, which were mostly offline events. However, with the widespread use of the internet, music dissemination channels and audience consumption patterns have fundamentally changed. Cuijia Suona has started to engage in online performances through digital platforms such as music streaming services, social media, and short video apps, providing audiences with more ways to watch performances. The ensemble uses these new dissemination models to adapt to the times, meeting the needs of contemporary audiences.

The impact of digitization on the transmission of suona culture is diverse and complex. On the one hand, online dissemination has expanded the reach of traditional music, allowing suona music to connect with previously unreachable audiences, especially younger generations (Zhao et al., 2023). These digital tools have enabled more people to appreciate the charm of suona culture, inspiring interest in the traditional instrument and even encouraging some to learn the suona. With the promotion of social media, short video platforms, and music streaming services, the dissemination of traditional music is no longer limited to offline geographical boundaries. Suona music can transcend regional and cultural barriers, bringing its sound to the world.

However, digitization also presents new challenges for traditional music culture. In the process of music dissemination, Cuijia Suona is concerned that the entertainment characteristics of digital dissemination may cause audiences to focus only on the surface-level entertainment aspects of the music, neglecting the profound cultural connotations and historical value of suona music. This shift could dilute the traditional spirit of suona music, causing its cultural depth to be simplified or commercialized, thus losing its inherent historical and societal significance (Ma, 2023; Burbules et al., 2020). Additionally, online dissemination may tend to emphasize the popular appeal of suona music

rather than its unique artistic value, further limiting the audience's understanding of suona's diversity.

In terms of implementation, Cuijia Suona has been actively utilizing social media and online platforms to spread their music. They employ video live streaming, short videos, audio sharing, and public account promotion, enabling more audiences to discover and enjoy suona music through the internet. By recording instructional videos or live-streaming performances, the ensemble can interact directly with audiences. Viewers can communicate with artists via comments or video calls, enhancing engagement and simultaneously promoting traditional culture. However, the effectiveness of such promotion varies based on the suona ensemble's understanding and mastery of digital strategies.

However, virtual performances have also become one of the most important activities for Cuijia Suona, especially when offline performances are restricted. Virtual performances not only increase the size of the audience but also offer new business models, such as corporate sponsorships and viewer rewards, providing artists with additional income sources. Furthermore, virtual performances allow the preservation of performance recordings, which can serve as valuable resources for future dissemination and teaching. Other suona ensembles have utilized digital platforms to conduct online training, attracting many students interested in learning suona. The advantage of online teaching is that it breaks geographical and time constraints, allowing more people to learn the suona, even if the teacher and students are thousands of miles apart. However, there are limitations, such as the difficulty in teaching certain performance techniques and the weakening of emotional expression in music interpretation. Clearly, online instruction cannot fully replace in-person learning, but digital training provides a new pathway for the transmission of suona music, especially in nurturing new generations of performers (Xie, 2023; Duan & Qian, 2024; Chen, 2024).

Cuijia Suona faces the challenge of balancing tradition and innovation in the digital era. To maintain the traditional characteristics of suona music, performers need to preserve core performance techniques and cultural attributes. At the same time, new performance formats and the creation of new repertoires are necessary to meet the aesthetic demands of modern audiences. For example, Cui Shiguang has composed new pieces and arranged traditional repertoires, demonstrating that successful suona ensembles can strike a balance between tradition and innovation, retaining traditional features while staying in step with the times.

In achieving sustainable development, it is essential not only to integrate transmission and innovation but also to engage audiences (Valeri, 2019). Audience participation plays a crucial role in promoting the sustainable development of suona culture. During its development, Cuijia Suona has conducted online and offline community activities, allowing the audience to learn more about suona culture and actively participate. This fosters a loyal fan base and attracts more volunteers to support community activities. Such community engagement not only enhances audience recognition but also provides Cuijia Suona with dissemination channels and valuable feedback. Figure 1 is Cui Shiguang's performance activities and teaching pictures. Digital dissemination has diversified Cuijia Suona's income streams, with economic growth playing a crucial role in sustainable development. By combining income from both online and offline performances, teaching, digital content sales, corporate sponsorships, and government subsidies, suona ensembles can ensure a diversified economic base, reducing dependency on a single revenue stream, and providing financial security for long-term development. Although suona ensembles face many challenges in the digital age, by actively implementing digital strategies and maintaining a balance in transmission, innovation, community participation, and economic diversity, they are well-positioned to achieve sustainable development (Ruggerio, 2021; Bali Swain & Yang-Wallentin, 2020).



Figure 1. Cui Shiguang's performance activities and teaching pictures.

In the context of digitalization, traditional suona ensembles have not only gained new opportunities for cultural transmission but have also experienced significant impacts in the social and economic spheres. Through online dissemination, virtual performances, and online education, suona ensembles have diversified their revenue streams and strengthened their engagement with local communities.

Diversified Revenue Streams: Digital platforms have opened various new economic opportunities for suona ensembles. By utilizing social media, streaming services, and online course sales, they can broaden their revenue channels and reduce their dependence on traditional offline performances. The table 2 outlines the main income streams generated through digital platforms and their contributions.

Table 2. The digital platforms and their contributions.

Income Stream	**Description**	**Contribution**
Virtual Performances	Performing through live or recorded sessions, attracting audiences who pay for viewing or provide financial support through tipping.	Significantly increased audience reach and revenue sources.
Online Education	Offering recorded lessons or live interactive teaching, reaching students across the country without geographical limitations.	Provides a stable, long-term income stream.
Digital Content Sales	Sales of suona performance videos, audio recordings, and digital sheet music on platforms like Bilibili and YouTube.	Boosts revenue from cultural products.
Corporate Sponsorships	Attracting corporate sponsorships through virtual performances and cultural promotion events, facilitating brand partnerships.	Enhances the group's brand influence and generates additional income.
Government and Cultural Fund Subsidies	Financial support from government initiatives and intangible cultural heritage protection projects, promoting digital transmission initiatives.	A crucial supplementary source of income.

Community Cultural Engagement: Digitalization has not only expanded the audience base for suona music but has also enhanced community engagement. Online platforms enable greater participation from community members, particularly the younger generation, in the dissemination and learning of suona culture. By regularly organizing hybrid online and offline cultural activities, suona ensembles can foster stronger connections with their communities, enhancing audience loyalty and cultural identity.

Boosting Local Economy: The digital dissemination of suona music not only elevates the ensemble's visibility but also contributes to local economic development, particularly in tourism and the sale of cultural products. This hybrid form of cultural promotion, combining online and offline efforts, attracts audiences and visitors from outside the region, indirectly benefiting the local economy through increased tourism and cultural commerce.

Through these avenues, digital strategies not only enhance the social value of cultural transmission but also provide significant economic support for traditional suona ensembles, ensuring their long-term sustainability.

5. Research Conclusions and Recommendations

This study, through an analysis of the implementation of digital strategies by Cuijia Suona in the digital era, thoroughly summarizes the significant impact of digital strategies on the sustainable development of suona ensembles. The core pillars of digital strategies—online dissemination, virtual performances, and digital training—together form the foundation of these strategies. These strategies have helped suona ensembles break through the geographical limitations of traditional performance forms, bringing suona music to a broader audience. Moreover, they have created new income streams, forming a series of diversified business models. Through these approaches, suona ensembles have been able to expand the breadth and depth of their cultural transmission.

In conclusion, the strategies for developing traditional culture in the digital era can be summarized as follows:

1. Promotion strategies: Utilizing digital platforms to enhance the dissemination of suona music is an indispensable promotion strategy in the digital era. Suona ensembles can use social media, music streaming platforms, and short video platforms to release high-quality music performances or educational content, and conduct interactive online activities to attract a wider audience and increase music dissemination. While promoting, the historical background, application contexts, and cultural connotations of the music pieces can be incorporated, allowing the audience to gain a deeper understanding of suona culture while appreciating the traditional music.

2. Performance strategies: Virtual performances are an important means of expanding the audience base for suona music and should be further utilized. Suona ensembles can regularly hold virtual concerts, offering interactive features such as live-streaming interaction, online rewards, and virtual souvenirs to create an enriching performance experience. Performers can also collaborate with other types of music groups, folk organizations, or engage in cross-disciplinary performances, thereby enriching performance content and attracting audiences with different interests.

3. Training strategies: Cultivating suona music talents through digital platforms is a long-term strategy. Suona musicians can offer online courses, providing instructional videos and interactive classes at various levels, from beginner to advanced. They can give students timely feedback and guidance. Moreover, collaboration with schools, institutions, and music academies to incorporate suona teaching into formal curricula, and conducting traditional arts in school programs, can encourage young people and students to learn this traditional art form, providing a talent pipeline for the future development of suona music.

These digital strategies not only enrich the cultural transmission and dissemination of suona music but also inspire a new generation to love and support traditional culture, offering strong support for the sustainable development of suona music culture. In this rapidly changing digital age, suona ensembles must make full use of these new tools and methods, maintaining the unique and profound characteristics of traditional music while adapting to the tides ofthe times to achieve both cultural and economic sustainable development.

Limitations and Future Research Directions: This study acknowledges that the sample size in the data collection process was relatively small, which may limit the comprehensiveness of the research. The number of suona ensembles covered in this study was limited, potentially causing some unique strategies or perspectives to be underrepresented. Additionally, the responses from

some interviewees may be subjective, leading to potential biases in the data analysis. Future research can delve into several key areas. First, while this study highlights the short-term benefits of digitalization for suona ensembles, its long-term impact on cultural transmission remains to be fully examined. Future research could explore whether digital platforms can genuinely engage younger generations with traditional culture, foster intergenerational transmission, and influence cultural identity in the long run (Ismail et al., 2019). Second, future studies should broaden their scope by conducting comparative research across different cultural contexts to understand how traditional music groups around the world are responding to the digital age. Such cross-cultural research would be instrumental in identifying both commonalities and differences in global approaches to sustaining traditional music. Additionally, the application of emerging technologies, such as virtual reality, augmented reality, and artificial intelligence, holds vast potential for traditional music. Future research could focus on how these tools enhance the effectiveness of music transmission. Lastly, digitalization's impact on traditional music education is another promising area for investigation. Future research could explore how online teaching models affect students' artistic literacy, performance skills, and cultural understanding over the long term. These expanded research areas would provide a more comprehensive theoretical foundation for the continued development of traditional music in the digital age.

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