

Preserving the Art of Quan họ Singing and Folk Theatrics amid the Fourth Industrial Revolution: A Preliminary Proposal

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Abstract

Quan họ folk songs and folk theatrics are two typical traditional performing arts heritages of the Vietnamese people in Northern Vietnam. They are also intangible cultural heritages that need to be prioritised for preservation and promotion in the current context of globalisation. Quan họ is an art form of male and female reciprocal singing, showcasing some typical characteristics of ancient Vietnamese folk music. It has been included in UNESCO's list of World Intangible Cultural Heritage.

Along with that, folk theatrics have been created and practiced by the Indigenous people of this region for thousands of years and are still being passed down through generations of Vietnamese people. However, this art form is at risk of disappearing from the folk cultural life of the region. Folk theatrics contain many philosophies about traditional ethics and profound humanistic thoughts and are among the important factors in shaping the traditional culture of the Vietnamese people in the North. Therefore, they need to be preserved and promoted today.

For many years, numerous research works have discussed the cultural, artistic, and historical values of these heritage forms – most of which also mention the challenges of preserving and promoting them in contemporary social life.

However, using digital technologies as a solution for these issues has not received much attention from scientific studies. These are two types of intangible cultural heritage with similar artistic content, allowing digital technology to be applied to digitise each of their artistic elements in detail. Based on research at the Vietnam Institute of Music, as well as surveys and fieldwork in villages, the objective of this paper is to present the key aspects of Quan họ singing and folk theatrical art.

The outstanding contribution of this paper is that, for the first time, specific details of each heritage content are clearly identified from the perspective of an in-depth researcher in ethnomusicology. This provides valuable insights for digital experts to support the preservation and promotion of similar folk art heritages across different cultures. However, a limitation of this study is that it does not analyse in depth the formulas and algorithms used for digitisation activities.

Keywords: Quan họ art, Folk theatrics, Art intangible heritage, Vietnam, Conservation, Promotion, Digital technology

Introduction

Quan họ was formed and developed in 49 ancient villages, 44 of which belong to Bac Ninh province. The remaining five villages are in Bac Giang province. At the beginning of the Lunar New Year, people from all over Vietnam, as well as international tourists, have the opportunity to enjoy the smooth and deep melodies of Quan họ music, performed at various festivals. Along with the festive atmosphere of the traditional New Year,

Quan họ art holds significant meaning and represents a unique cultural feature.

Quan họ has a number of methods and tunes, as well as up to several hundred songs. These compositions are further divided into different groups and used according to certain principles, some of which were established many centuries ago. One of the typical activities of Quan họ art is *Canh* singing, which follows

a system of rules and can last for many hours or even multiple nights (Dang et al., 1978).

Historically, there have been many studies on the origin and name of Quan họ art. Vu said, “Quan họ is the song of an official of the Ly family singing to celebrate the king when he returns to his homeland” (Vu, 1972, p. 85-92). However, there are also opinions that “Quan họ singers are related to each other like relatives” (Le et al., 2006, p. 53). According to research by Nguyen, “In folk memory, the custom of singing Quan họ is associated with the custom of singing at the gate, and the two words Quan and họ refer to the feeling of ancient bibliographies” (Nguyen, 2010).

However, in some important Vietnamese dictionaries, Quan họ is explained very simply as “lyrical folk music of the Bắc Ninh region” (Hoang, 1997, p. 711). In the *Vietnam Encyclopedia*, Quan họ is identified as a lyrical singing style, in which men and women respond to each other in song (National Council directs the compilation of the *Vietnam Encyclopedia*, 2005). It takes its name from the twinning of two or three villages that organise singing together. This singing style is popular in 49 villages in Bắc Ninh province. The participants in the singing are called “brother” and “sister,” with the hierarchy “*Anh cả, Anh hai...*” and “*Chị hai, Chị ba...*” They meet in groups called “Bọn Quan họ”. Male Quan họ groups consist of boys (*Liền anh*), and female Quan họ groups include girls (*Liền chị*). Traditionally, the male group from one village sings with the female group from another village. When singing, a male couple sings with a female couple. In each pair, one person sings the main vocals while the other follows, creating a culmination of art. Although two people are singing, it sounds as if one person is singing.

In terms of performing arts, researchers have concluded that Quan họ includes traditional forms such as reciprocal singing, *Hội* singing, happy singing, *Thi* singing, worshipping singing (*hát thờ*), and praying for luck (*hát cầu đảo*). The songs mainly focus on three stages (*ba chặng*):

The first stage – the *chặng* of singing – includes the vocals “*Hừ la, Là rằng*”; *giọng* “*Cái à*”; *giọng* “*Kim lang*”; and *giọng* “*Cây gạo*” songs. These are very difficult vocals, with a special emphasis on “bouncing” (*nảy hạt*) singing techniques. The style is usually sung at a slow tempo, and the melody and lyrics feature a rich

use of consonants and vowels. People who sing traditional Quan họ songs must master the techniques of *vang, rền, nền, nảy, ngắt*, and *rót* to perform well and “correctly” (*ra chất*) in the Quan họ style. This stage marks the beginning of a Quan họ chant, and if one does not sing according to the rituals, it cannot be considered a Quan họ song. Once the vocal songs of *Lễ lới* are finished, they transition into *Vặt* voices (Nguyen, 2004).

The second stage – the *chặng* of the voice (*Giọng Vặt*) – includes songs about love, natural landscapes, and the singers’ emotions. This is why Quan họ melodies, filled with deep emotions, continue to develop, creating top-notch artistry in both musical composition and lyrics (Nguyen et al., 1962, p. 22-36). Once these boys and girls decide to marry, they must leave the Quan họ group.

The third stage – the last *chặng* – is also known as the voice of “*Giã bạn*”. This stage is sung when Quan họ groups bid farewell to one another. In many instances, their farewell songs last for two or three hours as a way of expressing love and respect for each other. As a result, during a Canh Quan họ singing session, performances can last from 7 p.m. until 2 or 3 a.m. Some localities and Quan họ groups even organise singing sessions that continue from night to night (Nguyen et al., 1962, p. 22-36).

These stages are practiced in most Quan họ cultural spaces in Bắc Ninh and Bắc Giang, especially during the festive seasons and the Lunar New Year. Through these stages, Quan họ is maintained and developed from generation to generation. In other words, through the singing stage in Quan họ’s cultural spaces, the art form has become an indispensable artistic heritage in the cultural and religious life of the Vietnamese communities here.

Thus, when enjoying a Quan họ performance, if one pays attention to the art and richness of this type of music, it is necessary to observe the division into stages as well as the singing process. Along with that, these are the parts that Quan họ brothers and sisters stipulate to achieve high aesthetic value, promote creativity, and ensure the continuous development of this unique musical art. There are three stages of singing: *Lễ lới*, *Vặt*, and *Giã bạn*. Songs belonging to these three stages have a reciprocal relationship with each other, based on the melodic nature and logic of the verses and singing

stages, helping the art of Quan họ to be constantly fostered and perfected.

Along with many artistic characteristics similar to Quan họ, in the Northern Delta region of Vietnam, there are also many folk theatrical arts. Alongside stage drama imported from the West in the early 20th century, traditional theatrical forms such as *Tuồng*, *Chèo*, and *Cải Lương* remain prominent. These traditional genres are based on literary works or stories, using a system of musical melodies to convey the thoughts and customs of the Vietnamese people through characters and roles performed on stage. Additionally, Vietnamese folk performing arts include pre-theatrical forms, such as folk plays embedded in the cultural and religious life of the community for centuries (Nguyen, 2022; Nguyen, 2014). The primary creative method in most of these art forms is dramatization, particularly of religious and spiritual ideas. These include Buddhist, Confucian, and traditional Vietnamese beliefs, contributing to the development of a unique art form with distinct characteristics rooted in the local community.

Plays influenced by religious ideologies were shaped and developed over centuries. Notable examples include *Nhị Thập Tứ Hiếu* (Twenty-Four Filial Piety, Confucianism), *Chèo Đò Giáo Ngựa* (Ancestor Worship), and *Mục Liên, Thanh Đề* (Buddhism). These plays express the religious spirit and ideology that have been dramatised in this region.

Theatre has a long history of existence, along with its artisanal and social functions, as well as the system of moral and educational values and religious beliefs it contains (Cartocci, 2024; Nguyen, 2022; Robertson, 2009; Fischer, 1995; Eco, 1997; Berezin, 1994; Quinn, 1995). Theatricalisation is an art form with the important function of conveying the messages of a religion or specific ideology through the creativity of a community or individual within a particular time and space, and Vietnamese folk theatrics are deeply embedded in traditional values.

Amid the Fourth Industrial Revolution, access to and use of high technology to preserve, promote, and develop traditional Vietnamese performing arts such as Quan họ and folk theatrics will be particularly important. However, leading agencies in the research and management of performing arts, such as the Vietnam Academy of Music and the Vietnam National Institute of Culture and Arts, have not promoted the

application of this technology for conservation for many decades.

In Vietnam, most academies and universities specialising in traditional performing arts and the study of traditional ethnic culture and art have not been focusing on the use of high technology for the digitisation of art, relying instead on videos, movies, and photos. Most localities do not have a dedicated website for promoting cultural heritage and traditional performing arts associated with ethnic groups in their provinces. Meanwhile, the digitisation of cultural heritage has been implemented by countries worldwide for decades.

Nowadays, technologies such as slow-motion, 3D, 360-degree imaging, fly cams, and other advanced tools for digitising traditional performing arts promise to be a turning point in the preservation and promotion of this heritage, marking an important contribution to economic and social development.

Literature review

Intangible cultural heritage, including folk performing arts, is an important cultural resource for each identity, ethnic group, and country. According to UNESCO, cultural heritage includes not only monuments and collections of artifacts but also living traditions or expressions inherited from ancestors and passed on to descendants (Kico et al., 2018, p. 72). Humanity has always learned from previous experiences for many reasons. National heritage proves to be an excellent way to explore the history of a country. Therefore, these invaluable cultural items deserve special attention (Belhi et al., 2017). According to Doulamis et al., intangible cultural heritage is the main driver of cultural diversity and, therefore, should be the focus of efforts to preserve and protect cultural heritage (Doulamis et al., 2017). Intangible cultural heritage as a field of study and a venue for digitisation efforts has grown significantly since the 2003 UNESCO Convention for the Safeguarding of Intangible Heritage. In contrast to tangible heritage, where cultural identity is expressed through physical objects, intangible cultural expressions are defined through tacit dependencies and specific activities. Such activities are often communicated physically, enacted, socially transmitted, and constantly evolving (Hou et al., 2022).

In 2011, the issue of digitising art culture came into focus. Art museums began using computers to help organise, catalogue, and coordinate their collections as early as the 1960s (Näslund et al., 2020, pp. 339-359). In recent times, art historians have incorporated digital tools into the emerging discipline of digital art history. Evens et al. have also detailed four key issues that hinder the sustainability of digital preservation in cultural heritage institutions: digitisation, metadata indexing, intellectual property rights management, and business models (Evens et al., 2011).

Digitisation has enabled many ancient cultural heritages to be revived, presented, and promoted around the world. From the ancient library of Alexandria 2,300 years ago, cultural collections have shared a common foundation: the collection, preservation, and promotion of knowledge that has contributed to the intellectual and cognitive evolution of humanity (Doulamis et al., 2017).

Hou et al. (2022) argue that the growing trends in computational heritage and ICT applications have played an important role in safeguarding intangible cultural heritage because they create diverse resources while making them accessible to the public (Hou et al., 2022).

However, as of 2022, according to Hou (2022), one of the main challenges is finding appropriate formats, along with effective methods, to record the ephemeral aspects of intangible heritage. Another barrier is identifying effective ways to communicate knowledge that is closely tied to people. In response, recent efforts have been made to capture the “living” and “performing” aspects of embodied cultures, requiring solutions for the technological and managerial complexities of conveying both material and immaterial aspects in a meaningful context. Meanwhile, advances in experimental museology have opened up new ways of experiential storytelling, particularly through visualisation, augmentation, participation, and immersive embodiment (Hou et al., 2022).

Regarding the relationship between technology and heritage, as presented above, heritage represents the identity and cultural characteristics of each culture and ethnic group. Heritage cannot be separated from technology because technology serves as a tool to help people preserve and promote heritage. It enables individuals from different cultures and countries to

explore and enjoy cultural heritage, including Indigenous folk cultural heritage from various nations.

According to Belhi et al. (2017), with the widespread application of new digital technologies, the recording, storage, and display of cultural heritage assets have become more efficient and reliable. These digital records are later used in various applications. Researchers have seen opportunities to use digital heritage records for long-term preservation. Belhi et al. (2017) present research progress in the digital processing and preservation of cultural heritage, highlighting the advances that have had the greatest impact. Additionally, they introduce the CEPROQHA project, which is based on a novel approach to achieving cost-effective digital collection and preservation of cultural heritage artifacts in Qatar (Belhi et al., 2017).

Petri et al. (2017) note that in 2017, the Available Light Film Festival (ALFF) in Whitehorse, Yukon, partnered with the Yukon Arts Centre to screen three digital media installations to complement its public and industry series programming of Canadian and international films and live performing arts events. Screened in gallery and foyer spaces, attendees had the opportunity to experience artistic expressions that crossed traditional art forms by digitising dance and theatre and creating new forms of animation. Additionally, in 2017, ALFF partnered with iTunes to bring the festival’s films to its own channel in the hopes of amplifying both its own and the films’ success (Petri et al., 2017, p. 22).

Petri (2017) also believes that the future trend after 2017 is the development of true 3D holographic projection technology for the consumer market. Meanwhile, many experiments have approximated holographic images using CGI (computer-generated imagery for creating visual effects in movies) and older projection techniques. The most notable example may be the “hologram” of American hip-hop artist Tupac, projected at Coachella in 2012. Similarly, Michael Jackson was revived in 2014 at the Billboard Awards (Petri et al., 2017, p. 28).

In the case of folk performing arts, Zhanna (2020) noted the importance of digitisation in preserving the intangible cultural heritage of the world’s peoples, using the example of visualising Kazakh folk dance patterns. Currently, significant work is being done worldwide to preserve intangible cultural heritage under the United

Nations' initiative through the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, adopted on October 17, 2003 (Zhanna, 2020).

Digitising folk performing arts and visualising folk dances has become an increasingly active research area in computer science, as noted by Kico et al. (2018). Folk dances are part of cultural heritage, and their preservation for future generations is of great importance (Kico et al., 2018, p. 72). In parallel with rapidly advancing technologies, new ways of learning folk dances are being explored, enabling digitisation and visualisation of various folk dances for educational purposes using different devices. Along with the challenges and limitations, solutions that can support the learning process and provide users with meaningful feedback are being proposed. In this paper, an overview of the techniques used to record dance movements is presented. Different methods of visualisation and feedback for users are considered, along with ways to evaluate performance (Kico et al., 2018, p. 72).

Hundreds of cultural heritage digitisation projects are underway in the U.S. One particular case is the Taos Pueblo Project, focused on the largest multi-tiered Native American village in the United States, which has been continuously inhabited since 1000 CE and is currently the only Native American community recognised by UNESCO as a World Heritage Site. Taos Pueblo is located on 95,000 acres, about 2 km north of the modern city of Taos. Working with the Taos tribal authorities, the U.S. National Park Service, and the World Monuments Fund, CyArk (2018) collaborated with Nolte Engineering to digitise the site in 2010 (CyArk, 2018). This project provides essential documentation to help preserve 11 village houses and allows internet users to access fundamental data to understand the landscape and heritage values. The cultural heritage related to the village has been digitised for conservation and promotion. In the late 20th century, consideration of the conditions affecting cultural heritage laid the foundation for the development of digitised applications for national heritage preservation, supported by both government and private organisations. Public agencies and private sectors have been called upon to support a national assessment of conservation needs and a U.S. cultural heritage protection plan (A Public Trust at Risk: Findings of the Heritage Health Index, 2007).

In France, the government has also digitised many cultural heritage sites to preserve and promote the country's history. The French Ministry of Culture and Communications has implemented the National Programme on digitalisation and Stabilization of Cultural Content. This programme is part of an effort to extract the geographical and organisational context of the new regions, specifically supporting the policy of digitising territorial cultural content. Since its inception, approximately three million documents and over 5,000 digitised works – including about 850 architectural and heritage sites – have been preserved using 3D technology, forming a large national database managed by the Ministry (Muriel, 2003). This initiative marks a major turning point in the management, conservation, and promotion of cultural heritage in France (Dessaux & Hagedorn, 2013).

In her work, Zhanna (2020) considered visual reproduction, i. e., digitising folk dance movement patterns according to the choreographic texts of famous folk choreographers, including Kazakh folk dances from books by notable Kazakh folklore collectors and choreographers such as Shara Zhienkulova, Dauren Abirov, and Aubakir Ismailov, as the main topic.

According to Zhanna (2020), restoring more accessible video images of the best examples of folk dance movements described in choreographic texts or books by masters of folk dance and folk theatre, and providing access to them via the Internet, would help preserve them for future generations and bring them to life in modern choreography (Zhanna, 2020).

Wilcer explored the topic of audiovisual and digital digitisation in relation to the performing arts. Three areas within the performing arts – music, dance, and theatre – were chosen to examine the challenges of digitisation from a more interdisciplinary perspective. According to Wilcer (2019), experts involved in organisations working on the digitisation of performing arts were consulted about their experiences and work processes using questionnaires and interviews. Discussions on this topic revealed similar concerns and barriers that exist among each of them, while being influenced by different organisational and individual priorities. The subjects emphasized the strong need for coordination and networking among experts to ensure effective digitisation and preservation. They also recognized similar areas of concern, such as copyright

and ownership of documents and the degradation of magnetic media formats (Wilcer, 2019).

Thus, technology has had a significant impact on the artistic life of the public, particularly in preserving and successfully promoting heritage and performing arts in today's interconnected world.

In Vietnam, the digitalisation of performing arts heritage has garnered interest and been actively implemented. Through a case study in Quang Ninh, Khac and his colleagues found that digital technologies such as 3D (digitising traditional costumes, performance venues, scanning musical instruments, and dance movements); 360 (digitising the process of performing music and folk dance); and slow motion (digitising musical melodies, the process of composing music, teaching folk songs or playing musical instruments, and other historical documents) play an important role in preserving, managing, and promoting local TPA heritage in contemporary cultural life (Khac et al., 2021).

Digital technology is primarily applied to tangible heritage, while intangible cultural heritage, including performing arts, has not yet received much attention. Currently, some Vietnamese use technology and digital media to record films and videos. Software to search for and document information on intangible cultural heritage has been developed and published in the form of electronic portals and websites. Key organisations involved in these efforts include the Vietnam National Institute of Culture and Arts and the Vietnam Institute of Music. Recently, the work *Research and Application of Multimedia Technology in Preserving and Promoting Intangible Cultural Heritage* by the University of Technology has utilised technology to preserve and promote heritage values (Vietnam National University, Hanoi, 2022). Various multimedia technologies have been employed to partially preserve and promote intangible heritage. In Quang Ninh, the concept of applying slow-motion, 3D, and other advanced technologies to digitalise the entire legacy of traditional performing arts is currently underway. In early 2022, a project to digitalise the folk music and dance heritage of the Dao people in Quang Ninh province was proposed and implemented to promote and develop community-based tourism.

It should be emphasised that, although significant advances have been made in the digitalisation of

tangible cultural assets – particularly in the field of 3D reconstruction – the electronic recording of intangible cultural heritage has not made comparable progress. Doulamis argues that one of the main reasons for this is the considerable challenges involved in the systematic electronic digitisation of intangible cultural assets, such as performing arts. Doulamis has proposed an approach to converting intangible cultural assets, particularly folk dances, into tangible choreographic digital objects. This approach is being implemented in the context of the European H2020 project *Terpsichore* (Doulamis et al., 2017).

Research methods

The research methods are qualitative and mixed methods. In the mixed method, to explore methods for the conservation of Quan họ and folk theatrics, we have used an interdisciplinary approach combining culture, art, ethnology, and IT. First, the research examined sources of documents on the history and art of Quan họ and folk theatrics based on the archives of the Institute of Music, Vietnam's largest traditional music centre. We conducted research and synthesized published sources related to Quan họ and folk theatrics, including monographs, tapes, and discs concerning the biographies of Quan họ singers and the art of Quan họ and folk theatrics.

In the qualitative method, this approach was also used to study some of Hanoi's talented Quan họ artists. In-depth interviews with artisans and recordings of Quan họ performances and individual Quan họ songs were utilized to identify and study the unique characteristics of Quan họ and folk theatrics. Based on this, the study analysed the history, culture, and performance art of Quan họ and folk theatrics, including its musical instruments, and aims to propose solutions for the digitalisation and preservation of Quan họ singing and folk theatrics today. Using the collected data, the study will analyse each group of content and select appropriate technologies for implementing digitalisation.

With many similarities in artistic elements when defining digitalisation, we spend more time discussing Quan họ than stage art to avoid duplication.

The research team analysed the components and parts of Quan họ and folk theatrics art, then identified

and selected technology groups that will help digitalise the art, including:

- Modules and software to perform the overall digitalisation of the entire Quan họ and folk theatrics performances;
- Modules and software to digitalise each part, such as singing, musical instruments, and dances;
- Software to digitalise documentary content on Quan họ and folk theatrics culture, history, and art;

- 3D, 360-degree, and slow-motion technology to digitalise the details of each part of Quan họ and folk theatrics art;

- A website to manage, preserve, introduce, and promote the art of Quan họ singing and folk theatrics. It should include an electronic map of places with Quan họ performances and folk theatrics, helping tourists and locals alike find and enjoy Quan họ and folk theatrics.



Figure 1 Simulation of folk songs melodies needs to be digitised

Source: Phuong (2023)

Results and discussion

Applying IT to Quan họ and folk theatrics art

Bắc Ninh has been the cultural and economic centre of the Kinh for many centuries, representing a land famous for its science and the development of religions in Vietnam. Quan họ in Bắc Ninh is unique compared to other localities in Bắc Giang province. To preserve this special heritage, we aim to apply IT to the art of Quan họ singing, using the strengths of digital technology, the internet, and advanced software to digitise every element of Quan họ. Digitising Quan họ includes an overview of the history of Quan họ art, focusing on the 44 original Quan họ villages in Bắc Ninh province. In this content, the study focuses on researching historical sources related to the position and role of Quan họ clubs in the old villages of Bắc Ninh. In addition, the list, as well as historical sources about the Quan họ singers (the *Liền anh*, *Liền chị* Quan họ), and the artists performing traditional musical instruments (ancient tradition, as Quan họ does not use accompaniment instruments) and related data sources, need to be digitised. These contents need to be digitised with specialised modules and dedicated websites to

preserve and promote Quan họ art, as well as serve as an important resource for this unique art.

A second essential content that needs IT to preserve is the main performance space of Quan họ art, as these are the places where Quan họ is practised, preserved, and taught from generation to generation. There are key spaces that require IT, including 1) Quan họ singing places, *Canh* singing between Quan họ clans, and twinning in ancient Quan họ villages (as depicted in the image above, these Quan họ spaces are typical and essential spaces that must be digitised); 2) spaces for Quan họ performances in traditional village festivals; 3) spaces for Quan họ singing contests at the beginning of the year; and 4) spaces where Quan họ singers worship the ancestors (such as *Viêm Xã* communal house). Resources related to these spaces need to be digitised with 3D, slow-motion, and 360-degree technology. Simultaneously, digitised sources of documents will be widely disseminated in management software in national libraries, university libraries, and other research and cultural management facilities in Bắc Ninh province. These resources can then be popularised on a

website dedicated to introducing and promoting the current Quan họ art.

The next, especially important content, that needs IT to be applied is the system of Quan họ performance programmes, that is, the stages and the system of Quan họ songs. Currently, in the Quan họ singing spaces in Bắc Ninh and Bắc Giang, traditional stages are preserved and promoted, and all of these need to be digitised. The melodic system in Quan họ also requires IT, as each piece of music has its characteristics that will require different modules for its digitisation.

It should be added that in Quan họ art, some songs include the art of performing the love relationship between male (artists *Liền anh* – *Anh cả*, *Anh hai*) and female (artists *Liền chị* – *Chị cả*, *Chị hai*). These would require to be digitised in their module. Likewise, dances and dance techniques also need to be digitised to comprehensively preserve the unique artistic performances. The image below (figure 3) shows a Quan họ performance, where the brothers and sisters of the villages get married, visit each other, and prepare for the singing.

An important aspect in determining the characteristics of Quan họ art is the performances. While singing, the artists use a very specific technique of vibrato (*vang, rền, nèn, nảy*). In addition to this, the technique of opening and closing the mouth while singing is also distinct from other traditional singing arts. Along with its techniques, Quan họ singing is characterised by pairs, that is, two people of the same sex singing together. Their techniques must ensure that both singers perform the same tune, sounding as though they are one person. This is achieved by combining the “lead” (*dẫn*) singer with the “melody” (*luôn*) technique, which are linked together so that the audience feels as if only one person is singing (Nguyen, 2012, p. 58-61). This is a very difficult singing technique and one of the main characteristics of Quan họ art, which also needs to be digitalised.

In parallel to the singing process, the artists (*Liền anh*, *Liền chị*) harmonise with an orchestra. The instruments are mainly traditional Vietnamese musical instruments. In this process, there are specific principles of Quan họ music that require a separate module to digitalise. The orchestra in Quan họ was only formed in the second half of the 20th century. Former Quan họ performers did not use orchestral instruments, but only

sang reciprocally. Later, when the art of Quan họ was performed on a professional stage, the orchestra was added to modernise the performances and suit the aesthetic tastes of contemporary audiences.

Similarly, the singing and performing techniques of folk theatre in this region share many similarities with the singing and performing techniques of Quan họ singing. Typical examples are the vibrato technique and the characteristic sustaining techniques in folk songs and traditional singing music of Northern Vietnam.

All such content should be preserved and promoted through IT in detail. Each performance, space, and technique of Quan họ and folk theatre should be preserved in detail and comprehensively.

Building modules

In order to apply information technology to preserve and introduce the art of Quan họ singing and folk theatrics, after determining the content of the art that needs to be preserved and introduced, we will build modules, from the module storing documents on Quan họ and folk theatrics cultural and historical data to separate modules for each programme, each table, and musical instrument performance.

Above are the basic modules, which can be extended with other modules for complex artistic details in the process of technical processing to store all characteristic values of Quan Họ art and folk theatrics.

The above modules include basic information, content, and form of Quan Họ and folk theatrics. After an audience accesses these modules, they will be able to understand the basic content of the art.

Thus, the core elements of Quan Họ and folk theatrics art need to be built separately. As the model above shows, several modules need to be created for a successful digitalisation. When readers want to study an element, they will focus on that module. Future generations of young people who wish to re-learn how to sing could then imitate the artists of the past by utilising such modules.

Applied technologies

These are important software solutions that we propose to use in order to preserve and promote the art of Quan Hò singing. These pieces of software allow us

to preserve both the objects (instruments, costumes, and props) and the intangible heritage (musical melodies, singing, and performing techniques), along with the performance spaces of Quan Hò art.



Figure 2 Traditional singing space needs to be digitised

Source: Department of Culture, Sports and Tourism of Bac Ninh province (2022)



Figure 3 A performance in Quan hò art

Source: Department of Culture, Sports and Tourism of Bac Ninh province (2022)

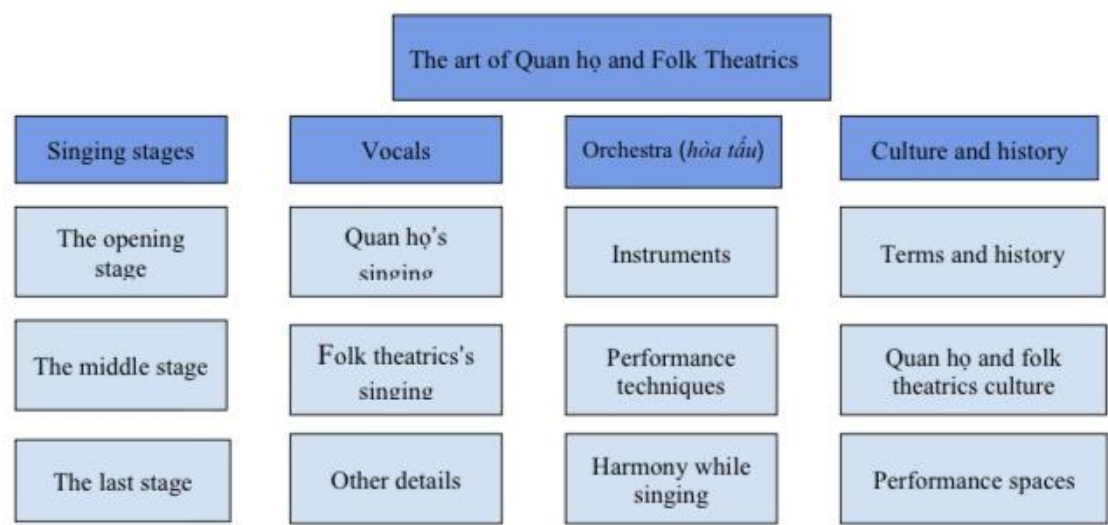


Figure 5 Simulation Module of conservation IT application Quan họ and folk theatrics
Source: Researcher’s Documentation (2024)

Table 1 IT software used in Quan họ and folk theatrics conservation

Software types	Contents
Slow-motion software	Processing music melodies, including Quan Họ songs and folk theatricals; melodies of accompanying orchestras.
360 degree software	Digitalising Quan Họ and folk theatrical performances, including singing stages and performance forms.
Encore, finale music recording software	Digitalising and processing music melodies in Quan họ and folk theatrics.
3D software	Processing and digitalising objects, including Quan Họ and folk theatrical orchestras and costumes.
Data storage software	Archiving and preserving documents on the history of Quan Họ and folk theatre.

Source: Researcher’s Documentation (2024)

Applying IT to the preservation of Quan họ art and folk theatrics

To preserve the art of Quan họ singing and folk theatrics, a detailed programme is required, which includes the script, as well as the specific contents and activities for each set of requirements.

Building a script before digitalising Quan họ art and folk theatrics is an essential issue. In other words,

building a good, quality script will help achieve the goal of applying IT to successfully preserve this art. In this process, besides the script, other details such as programmes from local cultural managers, surveys, and fieldwork need to be considered so that there is no confusion in the implementation of related procedures

Table 2 Process and activities of IT application

Procedure		Activities		
Write application programme script	Document study	Document classification	Determine the content of the outline	Write a script
Identify types of IT application techniques	Study international experience	Research domestic technologies	Identify the tasks of each type of technology	Decide to choose a technology mode
Identify art contents that need to be preserved and introduced by IT	Study the history of Quan họ and folk theatrics	Find out the outstanding features of Quan họ art and folk theatrics	Identify outstanding values in each part of Quan họ and folk theatrics	Decide on the contents that need IT to be applied
Film and record for digitalisation	Select Quan họ and folk theatrics club and artisans	Notice of work schedule	Build a filming programme	Film the art of Quan họ and folk theatrics
Create technology products to store and promote Quan họ singing and folk theatrics	Identify types of technology products	Buy technology devices	Apply technology and digitalise products	Produce technology products

Source: Researcher's Documentation (2024)

Discussion

Thus, intangible heritage is identified as an important asset of Vietnam as well as other cultures. Over the past few decades, UNESCO has made continuous efforts to protect various types of heritage, including intangible cultural heritage.

Digitalisation activities to preserve and promote intangible cultural heritage have been carried out for many years. Many methods, techniques, and perspectives have been studied by scholars worldwide to preserve each type of heritage, such as Hou et al. (2022); Belhi et al. (2017); etc. It can be seen that digital technology has made a breakthrough contribution to the preservation and promotion of intangible cultural heritage, particularly in the world. However, through an overview of previous research directions, we realised that digitising intangible cultural heritage requires very in-depth research by folk art experts.

Through the case of in-depth analysis of Quan họ folk singing and folk theatre, experts have pointed out

the content and details that are characteristic of folk singing art so that, on that basis, digital technology experts can receive and refer to them to digitise related heritages. Digitising folk performing arts is complicated by many factors and specific content. Traditional arts, including folk songs and folk theatre, not only have their own system of notes and melodies but also many other complex details, especially the singing techniques that are characteristic of each art form. All the stages of performance for each type, as well as the very specific performance spaces, require very in-depth research by art experts to provide full and detailed content for digital experts to execute.

This coordination not only helps each art form to be digitised and introduced in detail but also helps future generations, if they want to preserve lost art, to use these digital products to re-learn, restore, and preserve these heritages in contemporary life.

In this study, as art experts who have participated in the digitisation process to preserve folk art in

Vietnam, we focus on the artistic aspects and specific performance techniques of these two typical art forms to contribute to the history of digitising heritages now and in the future. Based on these very specific proposals, technology experts will conduct research, apply algorithms, and digital technology to each specific detail in each folk performing arts heritage across different cultures.

Digital technology has a particularly important role in preserving and promoting cultural heritage. However, it has mainly been applied to the conservation and digitalisation of tangible cultural heritage. This is a significant problem for the process of preserving and developing traditional music and intangible cultural heritage in general. The issue of applying and using the power of digital technology in cultural preservation has been confirmed on a worldwide scale.

Another issue that needs commenting on is that, while Quan họ and folk theatrics are cultural products of the feudal period, there are many contents that are no longer relevant to contemporary artistic life. Hence, many of its cultural values and good habits need to be preserved and developed in today's cultural life. Thus, the application of IT would be suitable to preserve this art and summarise its characteristics for many centuries. Introducing the identity of a people through an art form will be critical to bringing peoples and nations closer together. The application of IT is a strategy that brings many advantages, ensuring that the cultural values of Bắc Ninh, Bắc Giang, and all of Vietnam are introduced to the international community

Conclusion

The Vietnamese art of Quan họ singing and folk theatrics has become a representative intangible heritage of humanity in need of urgent protection. This art form is still being maintained in the cultural life of the community in Bắc Ninh, Bắc Giang, and the northern provinces of Vietnam.

The question is whether the application of IT to digitalise cultural heritage has been a concern for many countries around the world. The answer is that many projects and research works have focused on this issue and have been implemented in recent decades. However, in Vietnam, researchers have mainly concentrated on applying IT to the preservation of

tangible heritage, including pagodas, temples, statues, and other ancient objects.

For intangible art, such as Quan họ and folk theatrics, the application of IT should be considered a priority approach, one that should be swiftly implemented. The benefits that IT brings to the conservation and promotion of Quan họ art are of great significance for economic, cultural, and social development, as this art is a famous artistic heritage in Vietnam, recognised by UNESCO as a world heritage. This research direction also represents a breakthrough in the use of IT and digital technology to preserve and promote intangible cultural heritage, which can then also be applied to other national arts, such as *Chèo*, *Cải lương*, and *Xẩm*.

However, the challenge is that the application of IT must be carried out with an interdisciplinary approach, blending technology and heritage research. In other words, it will be difficult for an IT expert to digitalise an art form without knowledge of it, and vice versa, an artist will find it challenging to digitalise their art without IT expertise. Therefore, using an interdisciplinary approach to research, preserve, and introduce Quan họ and folk theatrics, as well as other traditional Vietnamese art, is a method that needs to be promoted.

Over the years, Quan họ art and folk theatrics have been the subject of many research projects. However, most of this research is merely descriptive and basic, intended for libraries. Some projects have been digitalised in video formats and stored on CD or DVD – both of which cannot last forever. There have not been many studies on applying IT to preserve Quan họ and folk theatrics in a comprehensive and complete way. This is unfortunate for the effort to preserve the traditional culture and art of Vietnam.

Therefore, applying IT, as outlined above, to preserve and promote Quan họ and folk theatrics is a direction that will create a breakthrough and bring Quan họ and folk theatrics heritage to the world. This is also a method to help Quan họ and folk theatrics art revive and thrive again in contemporary Vietnamese cultural life. Technologies such as 3D, 360-degree, and slow-motion, along with music and other modern software, will be the dominant and effective choices to preserve and introduce Quan họ and folk theatrics to every citizen and

researcher who is interested and wants to enjoy this Vietnamese art.

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Declaration of generative AI in scientific writing

This study was designed and written by us without using any AI technology.

Credit author statement

Associate Professor, Dr. Nguyen Dinh Lam is the main author of this article, including sections on Quan ho, issues when digitizing musical melodies and related sources in the process of digitizing a specific heritage. Dr. Nguyen Truong Son is the corresponding author, directly participating in the research on digitization results and research methods, exchanging other related contents of the entire article. Dr. Nguyen Thi Thuy Hang participated in the research on part of the digitization on folk theater art and discussed and revised the article.

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