

Dancing Nihon-buyō into the Digital World:  
An Attempt to Reconstruct Traditional Japanese Dance in 3D Using  
Monocular Video Recordings

by

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## Abstract

Among the traditional performing arts of Japan, Nihon-buyō (traditional Japanese dance) is an important traditional dance with cultural value as part of the traditional arts of Japan, as it builds on the various types of performing arts of the past. However, Nihon-buyō faces enormous problems, such as unclear terminology and definitions, declining popularity, and lack of participation in education by a declining population. These problems are far beyond the scope of what can be solved through the efforts of Nihon-buyō dancers. Previous studies of Nihon-buyō using motion capture and pose estimation techniques have contributed in various ways, such as preservation and use as archives, understanding and comparative analysis of works for dance research, education, and dance creation. However, the problem of not being able to capture costumes and the movements of their wearers has been pointed out. Using open-source datasets, which are commonly used in dance research, it is difficult to capture the movements of performing arts performed in Kimono.

To solve this problem, this study focuses on the Nihon-buyō costume, which has been a bottleneck in the creation and adaptation of training data in the 3D digitization of Nihon-buyō using pose estimation, and with the aim of solidifying the ground for the digitization of Nihon-buyō as a cultural resource, we will combine the motion of the dance and simulation of the Kimono. We will attempt to reconstruct three-dimensional data of Nihon-buyō including the motion of the Kimono.

In this study, five videos were prepared and filmed with the cooperation of three Nihon-buyō masters, and the motions were extracted by pose estimation and adapted to a CG avatar and a realistic CG-created Kimono to perform simulations.

This study ultimately experimented with what steps could be taken to convert Nihon-buyō into a three-dimensional digital cultural resource when the goal is to create and publish a digital cultural resource of Nihon-buyō by the practitioners themselves, and as a result,

reconstructed five Nihon-buyō videos in three dimensions and clarified what problems are faced in the process of 3D conversion.

In conclusion, this study emphasizes that activities aiming at the development and revitalization of Nihon-buyō need not only have the role of preserving the art of dance, which is disappearing on the spot, through digital archives, but also need to acquire the possibility of transmission and creative development for the purpose of transmission to people living today and the next generation by creating cultural resources. This study will help solve the problem of generating learning data by costume, which has been an obstacle in research using machine learning of Nihon-buyō, by generating synthetic data of dance movement and cloth-simulation of Kimono.

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## 1 Introduction

### 1.1 Motive

The first time I recognized Nihon-buyō (traditional Japanese dance) was when I watched a *Maiko* dance posted on YouTube. Students from Europe, whom I met in Republic of Malta over the summer, had never met a Japanese person, so they bombarded me with questions about Japan. However, in the 14 years of my life so far, I have not had much interest in Japanese culture, so I did not know enough about it to be able to talk about it and all I could do was Google it and answer questions.

After returning from my study abroad, I decided to seek my own identity in Japanese culture and to deepen my knowledge by viewing roughly everything that is considered Japanese culture, and for this purpose, I decided to view Japanese culture as it is recorded digitally. Among them, the one that caught my attention the most was the “Gion Higashi Kouta” performed by a *Maiko* named Kanoyumi. First, the appearance of the *Maiko*'s hair, makeup, costume, and fan; second, the mysterious and ingenious movements of her hands, head, and feet; and third, the deep singing voice of the woman, the shamisen, and the drums left a lasting impression on me. Incredibly, a girl a few years older than me was performing a beautiful Japanese dance in a video showing an extraordinary scene that had nothing to do with my daily life. I found it fascinating that she had mastered the art of performing beautiful dances, and that at the age of 15 she had decided to pursue a career as a *Maiko*, living within the traditional discipline. What inspired these girls to enter the world of traditional performing arts?

In fact, there are a certain number of young girls in Japan who have been attracted to *Maiko* after watching the videos. In recent years, many girls have become fascinated with *Maiko* after watching a TV program that documented their year-long training to become *Maiko*. Just as I was attracted to *Maiko* after watching the dance videos, other girls were inspired to become *Maiko* after watching these videos. This led me to believe that digital images can give people great inspiration and motivation. The power of digital information lies in its ability to reach people all over the world, regardless of physical limitations such as location and time. I would like more people to experience the kind of passionate encounters that I and other aspiring *Maiko* have had. For that, we need more immersive digital content, and right now, 3D content is the way of the future.

## 1.2 Background

In Japan, various types of performing arts have been developed and passed on as traditional performing arts. Among them, Nihon-buyō (traditional Japanese dance) is one of the most important traditional dances with cultural value as one of the traditional performing arts of Japan. Research on Nihon-buyō has been conducted from various perspectives, including dance studies, folklore, as well as cultural anthropology and sociology through the bearers of Nihon-buyō. The results of previous research have contributed in various ways, including preservation and utilization as archives, understanding and comparative analysis of works for dance research, education, and dance creation. Among these, research on the recording and transmission of dance as a subject has made innovative progress with the advancement of technology. In particular, following significant technological developments in the fields of motion capture and image recognition technology, many researchers have studied the digitization of Nihon-buyō over the past decade. In terms of motion analysis,

Watanuma et al. (2007) conducted a study in which motion capture was used to segment and evaluate Nihon-buyō movements into eight elements. Based on observations, Watanuma et al. (2007) suggested that lyrics, costumes, and related knowledge may influence the recognition of Nihon-buyō movements, and that there are two types of movements: those that can be discriminated from motion capture data, and those that can be discriminated by context, such as preceding and following segments and music.

At the Art Research Center, Ritsumeikan University, Kozaburo Hachimura has been engaged in research on digital archiving, preservation, transmission, and movement analysis of physical movement information of Japanese Intangible Cultural Properties from the perspective of using CG and VR technologies for humanities research (2003, 2004, 2005, 2006, 2007, 2008, 2016, 2017). Hachimura (2007) pointed out that one of the challenges in digitally archiving traditional performing arts such as Noh and Nihon-buyō is that motion capture alone cannot record the movements of costumes and their clothing, which are important for performances, as well as the state of the face, including makeup. Based on the above previous studies, it is pointed out that the Kimono, which is the costume of Nihon-buyō, is an unavoidable element in the digitalization of Nihon-buyō.

The digitization of Intangible Cultural Assets, including dance, can be viewed within the framework of cultural resource theory as an act of separating the target culture from its original context and incorporating it into a digital context to give it a new value. This study analyzes the trends of the Nihon-buyō population using sociologist Pierre Bourdieu's theory of cultural capital. It presents the possibility of development through the digitalization of Nihon-buyō as a way to increase the population participating in Nihon-buyō.

In recent years, the equipment and applications needed for motion capture have become inexpensive, and it is now possible to digitize the data without complicated labor. The usual method of outputting three-dimensional dance information has been to attach sensors to

people to measure their movements, but recent research has made it possible to output dance motions from two-dimensional video information using datasets that have learned motions through machine learning.

However, attempts to estimate motion from video recordings of Nihon-buyō using open-source datasets do not yield good output results. This is a problem that occurs when estimating the pose of a person wearing a long skirt or other clothing that largely hides the lower half of the body, but in the case of Nihon-buyō, the dancer wears a simple version of a Kimono called *Yukata* even during practice, making it difficult to estimate posture from most video recordings of Nihon-buyō that have been made.

In addition, no research has been conducted on the digitalization of Nihon-buyō with a focus on costumes. Therefore, to solve this problem, this study attempts to reconstruct three-dimensional data of Nihon-buyō, including the movement of the Kimono, by combining the motion of the dance and the simulation of the Kimono, to advocate a foundation for the digitalization of Nihon-buyō as a cultural resource. To extract the motion of Nihon-buyō by pose estimation, with the cooperation of three master dancers of Nihon-buyō, we prepared video footage of them dancing the same performance of Nihon-buyō in two patterns, one wearing a Kimono and the other wearing modern clothes. In order to create a reconstruction that can be viewed in three dimensions, CG data of the Kimono reproduced with high fidelity is required. The Kimono was modeled based on literature research and interviews with actual dancers, and animations were created and synthesized using cloth-simulation to simulate the behavior of the fabric of the garment. Blender, a widely used CG software, was used for the CG modeling, and Marvelous Designer, which is used to design clothing for CG games, was used for the clothing and its cloth simulation.

### 1.3 Organization

This dissertation is organized as follows. Chapter 2 provides an overview of Nihon-buyō and its current status. It examines the bearers of Nihon-buyō, the definitional issues of Nihon-buyō, and the problems facing Nihon-buyō. In Chapter 3, I review the cultural resources used in this study and explain why Nihon-buyō should be viewed in terms of cultural resource theory. In Chapter 4, I review previous cases of Nihon-buyō using technology that can hold more information as digital cultural resources and discuss what are the bottlenecks of digitization of resources. It also introduces the main methods of three-dimensionalization of dance. Chapter 5 describes the experiments and methods of simulating the motion of Kimono and dance on computer graphics, which were created as a method to solve the problems of Kimono identified in Chapter 4, and Chapter 6 describes the results and problems. Chapter 7 discusses how digital cultural resources, including 3D information, can have an impact not only on the preservation of past Nihon-buyō, but also on future dancers. Chapter 8 concludes by reviewing the current state of Nihon-buyō and discussing what kind of movement is needed for Nihon-buyō to continue to develop in various ways in the future.

## 2 About Nihon-buyō

### 2.1 The Importance of Nihon-buyō

Nihon-buyō represents one of Japan's culturally important traditional performing arts. The cultural significance of Nihon-buyō can be understood from the following three points. First, it has a history and rich works, schools and techniques. Second, it is used as a Japanese symbol representing Japanese traditional performing arts at national and diplomatic events. Third, it has been registered as a cultural asset of high historical or artistic value to the Japanese people as an object to be preserved and used. First, I will outline the Nihon-buyō from a historical perspective. According to the established theory that the origin of Japanese performing arts can be traced back to *Amanouzumenomikoto*, one of the gods in Japanese mythology, the flow of Japanese performing arts laid the foundation for the formation of Okuni Kabuki through actors such as *Miko*, *Kugutsume*, *Asobime*, *Shirabyōshime*, and *Kusemaime* (Wakita 2014). Nihon-buyō is a traditional Japanese art that has been handed down to the present since it became independent from Kabuki in the middle of 17th century, beginning with Okuni Kabuki, which is said to have been started by Izumo no Okuni in 1603. Nihon-buyō has achieved a diverse development by incorporating the music and methods of other genres of performing arts, and has acquired rich works, schools, and dance techniques through continuous creation and transmission. Since Nihon-buyō was separated from Kabuki by establishing the profession of Kabuki choreographer, its technique has been taught not only to privileged and limited people, but also to ordinary citizens. As a result, it has taken root in everyday life and is regularly performed at festivals and other events. Thus, Nihon-buyō is an important culture that constitutes Japanese culture, not only in that it is a cultural

art with a history of several hundred years, but also in that it is a culture that has existed together with the life of its predecessors, and it can be said that the cultural importance of Nihon-buyō has been recognized by the Japanese government.

It is clear that Nihon-buyō is an important culture for Japan, as its cultural value is recognized through international exchange events and cultural preservation systems by the Japanese government. The *Tokyo Taisho Hakuran kai* (Tokyo Taisho Exposition) and the *Taisho Tenno Sokui Rei* (enthronement of Emperor Taisho) are specific examples of the many Nihon-buyō performances of *Odori* and *Mai*, mainly from Edo (former Tokyo) and Kyoto, by renowned Nihon-buyō performers.

In addition, Nihon-buyō is considered a protected culture under Japanese law: the Law for the Protection of Cultural Properties (Act No. 214 of 1950), a cultural property law enacted in Japan in 1950, provides for the protection of important Japanese cultural properties and was amended in 1954 to include Intangible Cultural Properties under its protection. The Japanese government recognizes and subsidizes holders of a nationally designated Important Intangible Cultural Asset, commonly known as “Living National Treasures,” to ensure that these techniques are maintained and that their successors are nurtured. The inclusion of Nihon-buyō dancers among the Living National Treasures indicates that Nihon-buyō is an important part of Japanese culture.

However, since the purpose of this study is not to explore Nihon-buyō itself, I will only present some of the studies on Nihon-buyō. For Kabuki dance, Setsuko Nishikata conducted historical research in “Kindai Nihon Buyō shi” (2006), and Masakatsu Gunji and Shiro Shibasaki (1983) provided commentaries on the works in “Nihon Buyo Meikyoku Jiten.” For Kyo-mai, Mariko Okada conducted a comprehensive study of the Inoue school in “Kyōmai Inoue ryu no Tanjo” (2013). In the following sections, I will focus on knowledge regarding Nihon-buyō that is essential for creating digital cultural resources of Nihon-buyō.

## Elements

It is the three elements of *Mai*, *Odori*, and *Furi* that make Nihon-buyō what it is: These are included in varying degrees in both *Kamigata mai* (Kamigata dance) and *Kabuki buyō* (Kabuki dance), as well as in Creative dance (Nishikata 1980, pp. 14,48,78-80). In order to deal with Nihon-buyō, we will first explain the three specific components of Nihon-buyō. *Mai* and *Odori* have been distinguished and called by different names because they differ in place, source, and form of movement, respectively. *Mai* refers to the movement of walking slowly on the stage and turning with a slip of the foot with simple and limited movements, which is derived from *Kagura* (Shinto music and dance), *Bunraku* (puppetry), and *Noh gaku* (*Noh* drama), which originated from the legend of *Amanouzumenoromikoto* in the “*Kojiki*” (Records of Ancient Matters) that *Amaterasuōmikami*, who was hiding in the cave called *Amano Iwato*, danced to bring her out from under the *Amano Iwato*. *Kamigata mai* or *Jiuta mai* (Jiuta dance) are examples of this type of dance. *Kamigata* refers to the *Kansai* region centering on Kyoto and Osaka, where the imperial court was located until the capital was relocated, and the lineage of the dance was carried by a limited number of people, including priestesses, entertainers, and aristocrats. Today, the Yamamura, Yoshimura, and Shinozuka schools remain as schools with roots in the *Kamigata* school of dance, but the Inoue school has made its presence known as the Kyoto school.

The beginning of *Odori*, which is compared to *Mai*, *Furyu* is considered the mother of *Kabuki buyō*. *Furyu* refers to folk performing arts, and the category of *Furyu odori* includes various dances such as *Nenbutsu odori* (Buddhist prayer dance), *Bon odori* (Bon dance), and *Taiko odori* (drum dance).

*Furyu odori* is a folk dance performed by a large number of people wearing gorgeous costumes and using elaborately designed umbrellas and props, and this led to the so-called *Okuni Kabuki*, a *Kabuki odori* performed by Izumo no Okuni, which is said to be the origin of the later Kabuki. *Odori* refers to the rhythmic repetition of physical movements, a universal element of *Odori* that is common to dances other than folk dances.

Finally, *Furi* is an element that developed as a result of the restrictions placed on Kabuki. Kabuki has continued to exist despite changes in its performers due to repeated restrictions imposed by the shogunate, from *Onna Kabuki* (women's Kabuki), including Okuni, to *Wakashu Kabuki* (young men's Kabuki), to *Yarō Kabuki* (adult men's Kabuki). This gave more depth to the art of Kabuki. Thus, during the *Genroku* period (1688-1704), the three elements of *Mai*, *Odori*, and *Furi* were consolidated, and *Onnagata buyō* (Kabuki, male actors playing female roles) flourished.

Of the Nihon-buyō composed of these three elements, *Kabuki buyō* and *Kamigata mai* are considered classical dances. *Kabuki buyō* is a type of *Odori* that flourished in the *Kantō* region centering on Edo (former Tokyo), and the majority of Nihon-buyō schools belong to *Kabuki buyō*. *Kamigata mai*, on the other hand, is a type of *Mai* that flourished in the *Kansai* region centering on Kyoto and Osaka, mainly in the form of *Zashiki mai*.

## Form

Nihon-buyō is essentially a solo dance performed in the center on a platform called *Shosaita*. Even when two or more dancers dance, they have roles to play and one of them is the main actor. Although group dances are common in folk dances and *Kabuki buyō*, it was not until the Meiji period (1868-1912), under the influence of modernization, that group dances emerged in Nihon-buyō. The *Shosaita* is a cypress platform 3 feet (0.9 m) wide, 12

feet (3.6 m) long, and 4 inches (1.2 m) high, constructed without the use of nails<sup>1</sup>. The stage made by arranging these *Shosaita* is called a *Shosadai*; placing this platform on the stage allows the performer's feet to move smoothly, and makes the sound more resonant in the foot-stomping action called *Ashibyōshi*, in which the performer's feet stamp the floor to make a sound. In most cases, due to the physical limitations of the front of the stage, the *Shosadai* consists of 16 vertical boards and two horizontal *Shosaita* in the rear.

On such a stage, Nihon-buyō begins and ends at the center of the stage. Setsuko Nishikata, a practitioner and researcher of Nihon-buyō, describes the characteristics of the dance space as follows

In contrast to ballet, which is a form of dance in which the dancer runs around the stage from front to back, left to right, and from corner to corner, trying to spread outward as much as possible, Nihon-buyō is characterized by its inward, centripetal expression. (...) In *Kabuki buyō*, the choreography has been to take three steps forward and three steps backward, returning to the original position. This is because the star is placed in the center, so that everyone can see it. At the same time, the introverted nature of the Japanese art form, which disliked the idea of walking around the stage uncontrollably, led to the creation of a stillness aesthetic that suppressed movement. The performers were required to have the skill and the heart to show the magnitude of their art, which did not require them to use every inch of the stage, but to be at the center of the stage, filling the entire stage space. This is the spirit of Nihon-buyō, which is called the quality of the art, the dignity of the art, and the grading of the art, and these are the essence of good manners (Nishikata 1980, pp. 84-85).

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<sup>1</sup> The *shaku* is a unit of measurement that has been used in East Asia since ancient times, and although there are some differences depending on the region and the time period, in Japan, 1 *shaku* is approximately 303 mm. On the other hand, when measuring the length of a Kimono, a unit of measurement called the *Kuzirazyaku* (whale *shaku*) is used, and 1 *shaku* in the *Kuzirazyaku* is approximately 378 mm.

Here, Nishikata emphasizes the difference in dance space between Nihon-buyō and ballet, using the term “aesthetics of stillness concealing movement” to describe the essence of the introverted Japanese art form.

This is not only a characteristic of Nihon-buyō movements, but also a characteristic of Nihon-buyō costumes.

The costume used in Nihon-buyō is, of course, the Kimono, a traditional form of Japanese clothing. The Kimono used in Nihon-buyō is made for the stage and is larger in size than a regular Kimono, and is classified into three types according to the style: *Hon ishō* (authentic costume), *Han ishō* (not complete, but not a plain costume), and *Su no ishō* (plain costume). The Kimono used in Nihon-buyō is made for the stage and is larger in size than a regular Kimono. Common to all types is the expression of the *Onnagata* of *Kabuki buyō*, the original form of Nihon-buyō: the expression of covering the arms and legs, wrapping and covering the body.

Due to the restrictions imposed by the shogunate, Kabuki was performed exclusively by men, and the actors assigned to play female characters were called *Onnagata*. In response to the problem of how male performers could play the role of women in the theater, Kabuki actors established the expression of women by concealing their bodies with costumes and creating *Iroke* through makeup, expression, and movements based on *Kata* (patterns).

*Onnagata* art was the result of a long process of research into femininity from the male point of view, and the ideal image of a woman was created through movement and costume (Nishikata 1980, pp. 60-61).

Indirect appeals other than the obvious practical ones are related to one of the aesthetic concepts in Japan, *Iroke*, which is considered to be an abstract concept, and corresponds to the *Bitai*, one of the three main components of *Iki* as proposed by Shūzō Kuki (1967) in his “The Structure of Iki.” *Iki* is a very complex and esoteric concept, but in discussions of *Iki*,

which are mainly concerned with the free arts (Freie Kunst), it should be understood that if an object is *Iki*, its sensory value is enhanced. *Iroke* in *Kabuki buyō* and *Nihon-buyō* may not be limited to the dictionary meaning. Let us define it here as an expression that is produced indirectly within constraints. *Iroke* in *Kabuki buyō* and *Nihon-buyō* may not be limited to the dictionary meaning, but here it is defined as an expression that is produced indirectly within constraints.

Compared to *Kabuki*, in *Kabuki buyō*, both women and men can be players, and both can play the roles of women and men, as well as neutral beings such as gods and spirits who do not belong to either. The basic posture of *Nihon-buyō* is a half-bent posture, in which the dancer moves with the inner thighs for the female roles and the outer thighs for the male roles, while walking is done by sliding on the feet. In other words, the use of leg and arm muscles is reversed for the male and female roles. Nishikata describes the specific movements as follows

In the female form, the biceps should be abducted as much as possible, the shoulders should be lowered, and the abductor muscles should be adducted with the palms facing inward. The quadriceps should also be inverted as much as possible, and the toes should also be turned inward by bringing the inner thighs together without a gap between them. This intentionally tightens the muscles, restricting all movement and making the expression more like *Onnagata*. On the other hand, in the male roles, the shoulders are naturally tense because the forearm abductors are abducted while the arms are turned inward, but the wide back muscles are used to relax the shoulders. The quadriceps are abducted as much as possible so that even the toes will turn outward (Nishikata 1980, p. 146).

Thus, the movements can identify whether the performer is playing a man or a woman. Furthermore, in addition to the gender of the role, the acting movements of the character being played are customized and performed according to age and status.

Unlike other dances that show physical beauty, *Nihon-buyō* is considered a dance that expresses the dancer's individual *Iroke* in style as a costume play. The Kimono, as a

component of the comprehensive performing arts, plays an important role in creating the visual beauty of Nihon-buyō. It can be said that the Kimono is part of the dance, since *Iroke* is created by the gestures created by the use of the Kimono in the Nihon-buyō. However, as will be discussed in more detail below, the Kimono is also a source of concern that threatens to undermine the survival of Nihon-buyō in modern Japan.

### Flexibility in Nihon-buyō

It is widely recognized that Nihon-buyō, due to its complex and elusive characteristics, can present barriers to individuals who have no prior exposure to the traditional art form, thus making it a less accessible form of cultural expression and potentially hindering the ability of interested individuals to engage in it as a leisure pursuit. There are two reasons for this: First, its complexity, which has been fostered by its long history of interaction with other performing arts; and second, its tendency to emphasize overwhelming visual beauty and entertainment value rather than the dramatic consistency and rationality of the artwork. Nihon-buyō specializes in teaching techniques from Kabuki and has expanded its practitioners to include ordinary children, but its earlier history is the same as that of Kabuki. Kabuki was subject to a number of restrictions imposed by government policies aimed at maintaining public safety, and consequently its practitioners were limited to young men, changing the nature of Kabuki as a form of theater. However, the government was not the only factor that brought about change. Kabuki, being a form of entertainment, was influenced by the tastes and preferences of the audience and the trends of the time. The emergence of *Gidayū bushi* in 1684 served as a catalyst for the decline of Kabuki as a popular performance to the point that people said, “Kabuki seems to have vanished.” In contrast, the popularity of *Gidayū bushi* only continued to rise and it ultimately surpassed the genre of *Ningyō Jōruri*.

(*Jōruri* puppetry). During the late 17th century to the late 18th century, Kabuki continued to flounder, however, it managed to regain its popularity by overtaking *Ningyō Jōruri*'s, ultimately leading to a decline in the latter's popularity (Tanaka, 2018, p. 226). Although Kabuki was in the doldrums from the 1680s to the late 18th century, there was one method that successfully countered the popularity of *Ningyō Jōruri* and, in turn, the decline of *Ningyō Jōruri*. The method in question involved appropriating and performing popular works from *Ningyō Jōruri* in the style of Kabuki, resulting in the decline of *Ningyō Jōruri*'s popularity. In this way, Kabuki, which was still in the process of developing its musical form, took *Ningyō Jōruri* as its musical element and developed it further by transferring the dramatic elements performed by the puppets to the actors. This movement continued, albeit on a different scale, and evolved, adopting what was popular and flexibly adapting its own compositional elements and theatrical devices to the tastes of the people.

Kabuki needed to have the nature of being sensitive to trends as an entertainment sought by the masses. The audience for Kabuki was the common people living in Edo, the cultural and political center of the city<sup>2</sup>, and since they sought visual enjoyment as entertainment, Kabuki was viewed by the people as a brilliant stage play that matched their aesthetic tastes,

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<sup>2</sup> While this discussion will focus on Kabuki in the Edo period, it should be noted that there were also Kabuki theaters in the *Kansai* region that flourished as *Kamigata* Kabuki. One specific example is the *Dōtonbori Goza* (the five theaters in *Dōtonbori*) in Osaka. The *Dōtonbori Goza* gradually shifted to entertainment halls and movie theaters after the Meiji period and no longer exists, but the Kansai University Research Center for Cityscape and Cultural Heritage of Osaka has conducted a computer-generated reconstruction focusing on the streetscape before the completion of the theater, *Shochikuza* in 1923. (Research Center for Cityscape and Cultural Heritage of Osaka, *CG ni yoru ōsaka toshi keikan no fukugen*, n.d., accessed January 10, 2023 <https://www.kansai-u.ac.jp/Museum/osaka-toshi/visual00.html>.)

without regard to its structure of programs, which seems irrational according to modern values. Therefore, there are many works in Kabuki that lack dramatic coherence and logic in terms of modern values. Gradually, more and more works were created so that the audience could enjoy a variety of dances and emotional expressions by connecting independent and showy scenes, and many of them became independent performances that are now performed in Nihon-buyō.

The fact that Nihon-buyō has been passed down to today is due to the fact that it has undergone various changes in the forms of Kabuki and Nihon-buyō, but, in the present day, the lack of knowledge and understanding of the forms and conventions of Kabuki and Nihon-buyō can impede the viewing experience for those without prior knowledge, making explanations necessary for understanding the works.

## 2.2 Who Have Been the Practitioners of Nihon-buyō? Three Types of Nihon-buyō Lineages

It is important to clearly identify who the practitioners of Nihon-buyō are when considering the topic. Furthermore, the definition of Nihon-buyō is also related to the question of what genre the practitioner of Nihon-buyō is considered to be, which can change the scope of the dance. Therefore, I propose to classify the practitioners of Nihon-buyō into

three categories: Kabuki lineage, *Karyū kai*<sup>3</sup> lineage, and dance/theater lineage. In the first category of Kabuki lineage, of which a large percentage is considered, are choreographers, Nihon-buyō masters who lived in urban areas and taught to the public<sup>4</sup>, and female masters who taught dance to women of high rank in Edo Castle, called *Okyōgenshi*, and to the wives and children of Samurai families. The choreographers, the founder of Nihon-buyō, were indispensable and important actors, and the *Okyōgenshi* and the Nihon-buyō masters of the towns, especially from the Edo period to the *Shōwa* period, were the behind-the-scenes players have been contributed to Nihon-buyō's continuation to the present day. In the second category of the *Karyū kai* lineage, the culture of *Asobime/ Yūjo* (courtesan) and Geisha who entertain guests and provide them with performances in specially created indoor spaces, continues to be passed down in *Karyū kai* even today and can be seen as a special culture that is different from that of the general public, and that preserves and passes on dance and performance within it. Lastly, I would like to present a classification of the dance/theater lineage, in which Nihon-buyō dancers and stage actors are considered to be correspond. While most Nihon-buyō dancers engage in both teaching and performance activities, this classification specifically focuses on those who perform Nihon-buyō as a stage art. Nihon-buyō dancers, who have acquired the status of a professional performer in addition to that of a dance instructor, can be considered as the most contemporary representatives of Nihon-buyō. Next, although perhaps not included in the narrower sense of the term, I would like to

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<sup>3</sup> *Karyū kai* refers to the society or world in which Geishas, or *Geiko* and *Maiko*, live and work. Their world is different from the general world and has its own unique social and value norms. As a physical place, it is called a *Kagai* or *Hanamachi*.

<sup>4</sup> It should be noted that in many cases the dance masters of the town were women.

include in this lineage the existence of popular theater performers and Takarazuka Revue performers. Nihon-buyō danced by actors of popular theater reinterprets the genre as a modern or “Creative” (*sōsaku*) dance form, bearing elements of both entertainment and popular trends, as Kabuki once did.

The Takarazuka Revue is a theater company that was founded in 1914 with the goal of creating a national theater. It began as a girls' theater troupe and was the first group in Japan to use an orchestra for accompaniment, to perform Nihon-buyō, and to perform revues. During the *Taishō* and early *Shōwa* period, the Takarazuka Revue adapted to the trend of improving Japanese theater and dance. Takarazuka Revue is famous for its performances of Nihon-buyō with an orchestra, but now it is mostly performances of musicals from abroad. However, it also stages original Japanese musicals that feature Nihon-buyō, and for that reason, Nihon-buyō is included in the curriculum of the Takarazuka Music School. Graduation from this school is a prerequisite for joining the Takarazuka Revue. Therefore, it can be seen that the Takarazuka Revue, which has not been traditionally considered as a representative of Nihon-buyō, is also considered a presence that broadens the possibilities of the diverse development of Nihon-buyō.

### 2.3 About Classification

#### On the Question of Definitions

In fact, the definition of Nihon-buyō is not clear, and the name and content of the genre vary depending on the source. *Sekai Daihyakkajiten* (Heibonsha's World Encyclopedia) defines Nihon-buyō as “Nihon-buyō, also called Hōbu or *Nichibu*. In a broader sense, it is a

generic term for all dances performed in Japan, including ancient dances, *Gigaku*, *Bugaku*, Noh, folk dances, *Kabuki dances*, and new dances. In a narrow sense, however, it refers to *Kabuki dance*, and is usually used as a general term<sup>5</sup>.” Based on this definition, an orthodox definition of Nihon-buyō can be considered to consist of three types of dances: *Kabuki buyō*, *Kamigata mai*, and creative dances. In modern times, *Kabuki buyō* and *Kamigata mai* are the classics, and these are generally called *Nichibu* (an abbreviation of Nihon-buyō, while the others are divided into creative dances. *Kabuki buyō* is a type of *odori* that flourished in the *Kantō* region centering on Edo (present-day Tokyo), and the five major schools of *Kabuki buyō* are the Fujima, Nishikawa, Hanayagi, Wakayagi, and Bando school, which are well known today. *Kamigata mai*, on the other hand, is a type of dance that flourished in the *Kansai* region centering on Kyoto and Osaka, mainly as the *Ozashiki* culture. This culture is that of the *Karyū kai*, entertaining guests with musical instruments, Nihon-buyō, and other artistic performances in specially designed rooms, and the four *Kamigata mai* schools known as Inoue, Yoshimura, Yamamura, and Umemoto are well known. On the other hand, it is said that creative dance was born as a result of the practice of the Shin-buyō (new dance) movement conducted by dancers<sup>6</sup> during the *Taishō* period (1912-1926) in response to the “New musical theatre theory” (*Shin gakugeki ron*) published by Shōyō Tsubouchi in 1904, which was part of a movement aimed at reforming Japanese culture to improve it after Japan came into contact with Western culture. These dances were called *Shin buyō* in contrast to *Kabuki buyō*, but misleadingly, the dances that came after this were also called by the same

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<sup>5</sup> Shogakukan Inc, “Nihon Buyo,” Sekai Daihyakkajiten, JapanKnowledge, accessed December 22, 2022, <https://japanknowledge-com.hawking1.agulin.aoyama.ac.jp/lib/en/display/?lid=102005620100>.

<sup>6</sup> The dancer here is not a Kabuki actor, but a professional choreographer.

name. This new dance is a creative dance, which became popular as a form of popular entertainment by choreographing to relatively modern and familiar songs such as *Enka* (traditional-style Japanese popular ballad), and folk songs.

### Is Classical Nihon-buyō Equivalent to Nihon-buyō?

The problem of defining Nihon-buyō cannot be ignored in the cultural policies of the Japanese government, but the inability to establish a clear definition is due to the fact that Nihon-buyō is considered to be the same as *Hōbu*. In order to clarify the problem of the uncertain extent to which the term Nihon-buyō encompasses, it is necessary to understand historically why the concept of *Hōbu* was born and why it has come to be recognized as equivalent to Nihon-buyō.

Nihon-buyō has evolved as a result of the fusion of various forms of entertainment such as music and dance that were transmitted through interactions with neighboring Asian countries, and forms of performing arts that had been developed in Japan. By arranging these influences in a Japanese style, a rich variety of entertainment has been created and diversified over time. However, this situation where the only foreign countries that the Japanese recognized as being outside of Japan across the sea were largely limited to Asian countries, persisted for a very long time. Japan's first encounter with the West occurred in the 16th century, specifically in 1543 with the arrival of a Portuguese ship and in 1600 with the arrival of a Dutch ship. This initial contact, marked by the presence of individuals with distinct linguistic, religious and physical characteristics, as well as exposure to Western civilization, had a profound impact on Japan. However, the Shogunate, which was the government at the time, implemented a policy of *Sakoku* (national isolation) from 1639 to 1854. This policy limited

Japan's interactions with the West to a single nation, the Netherlands, and allowed the importation of Western science and culture primarily through trade with the Dutch.

As a result, it is thought that for the majority of Japanese people, information about foreigners was limited to hearsay, and actual face-to-face interactions were limited to people of a certain status or in certain regions. However, following the Japan-U.S. Treaty of Peace and Amity signed in 1854, the Japanese government was no longer able to impose restrictions on the influx of foreigners and imported goods. This led to an influx of Westerners with different languages, religions, and physical characteristics, who came into contact with Western civilization and thus entered the daily lives of ordinary citizens and had a significant impact on the perception and culture of Japan. Thus, the opening of Japan to the West enabled people to recognize the peculiarities and attractions of Japanese culture that they had not been aware of before. Correspondingly, this expansion of existing perceptions and acquisition of self-recognition, which clarified the awareness of Japan as a nation and what belonged to it, led to the widespread use of different prefixes to distinguish various objects from the word *Hō*, which refers to the nation of Japan.

The term *Hōbu* was coined as a result of the above, but before the opening of Japan to the outside world, the expression of emotion to music through physical expression was originally called *Mai*, *Odori*, or *Butō* (dance)<sup>7</sup>. *Butō* is often misused to refer to *Buyō*, although it is said to have its origins in the tenth and final sentence of the *Shīyǐ* in the chapter of *Yuejì* of the Book of Rites, also known as the “*Lǐjī*,” and is an old term whose usage can be found in the “*Shoku Nihongi*” and the “*Tale of Genji*” (Fukunaga 1971, pp. 102-109). *Mai* and *Odori* had

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<sup>7</sup> *Butō* is now mainly used to refer to Western dance.

been called separately because of their different locations, origins, and forms of movement, but with the influx of Western culture, the term *Buyō* was created and used as a translation of Western dance.

It is a common theory that *Buyō* as a term was a new name used by Tsubouchi in his “Shin Gakugeiron” (New Musical Drama Theory) published in 1904<sup>8</sup>. This gave rise to the term *Yōbu*, which refers to dances from the West, and *Hōbu*, which refers to dances from Japan. Since the term *Hōbu* was created as a concept in opposition to Western dance, it initially held the meaning of “Japanese dance” in reference to dance forms that existed prior to contact with the West. However, it is no longer appropriate to categorize all domestically born dance forms under the umbrella of *Hōbu* as Japanese people began to perform Western dance forms and as new creative dance forms emerged those incorporated elements of Western dance. The lack of a definition for *Hōbu* also implies the absence of a definition for Nihon-buyō. Hence, the question of definition remains an ongoing issue in the field of Nihon-buyō.

#### Classification by the Law for the Protection of Cultural Properties

Despite the lack of a legally defined definition for Nihon-buyō, the government does protect it legally. This is due to the fact that it is not referred to by a specific, widely accepted

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<sup>8</sup> However, Masakatsu Gunji pointed out that the word *Buyō* was first used by Ōchi Fukuchi. Kubota Nagisa explains the significance of Fukuchi's use of the term *Buyō*: after frequent trips to Europe and becoming familiar with Western theater, and in consideration of what seemed to be unique to Japan and what was common to the West in traditional Japanese pretend and dance movements, he decided to create a new phenomenon or concepts that could be considered both *Mai* and *Odori*, with Western dance in mind (Kubota 1995).

name, Nihon-buyō, but simply as *Buyō* in a general sense. Because of the political nature of the name, definition, and value judgment surrounding Nihon-buyō, the government treats Nihon-buyō legally by classifying it into two categories, *Kabuki buyō* and *Mai*, and referring to it simply as *Buyō* (dance) under the Cultural Property Protection Law. In response to this definitional problem, Setsuko Nishikata, a Nihon-buyō researcher and dancer, has expressed her strong concern about the government's inability to use the term Nihon-buyō in public (Nishikata 2007, p. 250).

Despite protests from Nihon-buyō practitioners for a reconsideration of the definition, the Japanese government continues to refer to Nihon-buyō as simply dance in the legal sense in order to maintain consistency with Intangible Cultural Properties, Intangible Folk Cultural Properties, and Intangible Cultural Heritage. In addition to Nihon-buyō, there are other forms of dance, such as *Bon odori* (Bon dance) as a folk dance, but if the orthodox definition of *Kabuki buyō*, *Kamigata mai*, and Creative Dance is applied to Nihon-buyō, folk dances would be included in Creative Dance, and this would cause problems in distinguishing between Intangible Cultural Properties and Important Intangible Folk Cultural Properties, so the government cannot adopt this definition. Initially, the protection of cultural properties in the Japanese legal system began with the Law for the Protection of Cultural Properties (Act No. 214 of 1950), which aimed to preserve Japanese cultural properties. This law was amended in 1954 to include Intangible Cultural Properties, and further revised in 1975 to encompass Intangible Folk Cultural Properties. Prior to the 1975 amendment, both categories of Intangible Cultural Properties were classified together. After the amendment, classical performing arts were designated as Intangible Cultural Properties, while folk performing arts became a subcategory of Important Intangible Folk Cultural Properties. Furthermore, folk dances, including *Bon odori* and *Nenbutsu odori* (Buddhist prayer dance), were integrated as “Furyu Odori” and were recognized as Intangible Cultural Heritage by UNESCO on

November 30, 2022 (Ministry of Foreign Affairs of Japan 2022). It is important to note that Intangible Cultural Heritage and Important Intangible Cultural Properties differ in terms of the entity that created the system and the criteria for determining the classification of culture.

### Classification by Convention

The previously mentioned registration of “Furyu Odori” as an Intangible Cultural Heritage highlights the fact that Nihon-buyō is currently not receiving proper protection from the Japanese government in comparison. First, let us overview the World Heritage Convention in order to describe how “Furyu Odori,” which has been registered as Intangible Cultural Heritage, is being treated. The International Council on Monuments and Sites (ICOMOS) was established in 1965 as a consultative body of the United Nations Educational, Scientific and Cultural Organization (UNESCO), following the proposal for the protection of the world's shared heritage in the Venice Charter of 1964. The Convention Concerning the Protection of the World Cultural and Natural Heritage, which came into force in 1975, aims to protect human heritage, not just in times of armed conflict, as the Hague Convention of 1954 aimed to do, but also in peacetime. For this Convention, ICOMOS conducts World Heritage inspections for properties protected by the laws of the countries that have ratified the Convention. The Convention for the Safeguarding of the Intangible Cultural Heritage, which was issued in 2006, adds Intangible Cultural Heritage to the protection targets and has a mutual preservation relationship with the World Heritage Convention. The purpose of this convention is to protect Intangible Cultural Heritage, such as traditional dance, music, theater, traditional craftsmanship, rituals and festive events, from the crisis of disappearance and pass it on to future generations.

The problem I would like to address here is that although traditional dance is recognized as a subject of Intangible Cultural Heritage, and Nihon-buyō also has the potential to meet the criteria to be considered as such, it is given the cold shoulder compared to “Furyu Odori.” Certainly, “Furyu Odori”, a folk entertainment, is a folk dance that is close to the lives of local people and is important as a ritual event. Nevertheless, the decline and aging of its practitioners make it difficult to pass on, and it is conceivable that it is a culture that could disappear if it is not protected. For this reason, by registering “Furyu Odori” as Intangible Cultural Heritage, not only will it be protected as Japanese culture, but by registering it as World Culture under the international protection system, the Japanese government will carry out protection measures such as training successors, making records, repairing and making new tools, and promoting dissemination, and the possibility of future inheritance is expected to increase.

However, despite the fact that Nihon-buyō, like “Furyu Odori”, is a traditional Japanese dance and Intangible Cultural Properties as well, there is little protection for Nihon-buyō. Of course, protection and support are provided to Nihon-buyō dancers who have been certified as Living National Treasures, but compared to other performing arts, the protection policy for Nihon-buyō is thin. As a typical example, the lack of dedicated theaters and the non-implementation of talent development projects can be cited. While other Intangible Cultural Properties such as Kabuki, *Engei*, *Noh gaku*, *Bunraku*, and *Kumiodori* have their own dedicated theaters for performances, there is no such dedicated theater for Nihon-buyō. The talent development project run by the National Theater is limited to Kabuki, *Bunraku*, and *Takemoto*, and there is no government-led talent development project for Nihon-buyō (the Japan Council of Performers' Rights & Performing Arts Organizations 2008, p. 126). In the current cultural policy of Japan, there is a difference in treatment between Nihon-buyō and

other performing arts, indicating that there is a lack of support for the establishment and development of permanent theaters dedicated to performances.

## Differences in the Scope and Consideration of Nihon-buyō Depending on the Source

As mentioned above, what exactly is meant by the term Nihon-buyō differs depending on sources and contexts. For Nihon-buyō practitioners, Nihon-buyō is often defined in a narrow sense as *Kabuki buyō* and *Kamigata mai*, both of which are classical dances, while works newly created with contemporary music and motifs, and the people who dance them, are distinguished in the genre of *Shin buyō* (new dance). Although there is a tendency for new dance to be looked down upon by classical Nihon-buyō dancers, from the perspective of those who learn *Shin buyō*, it is a different kind of Nihon-buyō, and both new and classical dance are recognized as authentic Nihon-buyō (Nishikata 2007, p. 296). It can be said that Shin-buyō, which has gained popularity differently from classical Nihon-buyō, is a widely established definition for the people concerned.

On the other hand, the Japanese government does not seem to have paid much attention to the definition of Nihon-buyō, although it was discussed when the Cultural Properties Protection Law was enacted. The government only needs to protect what needs to be protected as Japanese culture, and there is no need to change the definition and name in order to maintain the status quo. In applying for registration as Intangible Cultural Heritage, unless external dynamics are added, such as the reinterpretation and re-recognition of *Bon odori* and other regional festival dances that have attracted attention in the process of making Japanese culture the culture of people around the world, and their incorporation as “Furyu Odori”, the

clarification of definitions will not be actively implemented. As long as this definitional problem exists, the recognition and perception of Nihon-buyō by the general public, especially those who have little connection with Nihon-buyō, will remain distant.

## 2.4 The Current State of Nihon-buyō

Nihon-buyō is currently considered to be in a period of stagnation, and it is said that it was more prosperous in the past than in the present, but we will examine why this discourse has become more common by focusing on five points: the decline in the Nihon-buyō population, the decline in Nihon-buyō's popularity, the decline in Nihon-buyō's media exposure, the high costs associated with Nihon-buyō, and educational issues. After confirming the conventional theory, this paper proposes a decrease in the utility that Nihon-buyō used to provide by examining it using the cultural capital theory. Before moving on to individual details, an overview of the reasons why Nihon-buyō is said to be in decline will be given. Nihon-buyō is thought to be going through the same process that Japanese society has followed up to the present, with three major problems: the decline in the total population due to the decrease and aging of the younger generation, economic pressures, and the transmission of skills. During the *Shōwa* period, when the percentage of young people in Japan was high, the booming economy led to a variety of entertainment, cultural, and economic activities, and this was also true for Nihon-buyō. As a consumer culture, Nihon-buyō had many competing entertainment and lessons, but it was vibrant with the creation of various new Nihon-buyō schools, a large population of Nihon-buyō, and a high presence in people's perceptions. However, with the end of the bubble economy, the balance of supply and demand for over-extended base of Nihon-buyō was lost, and as a result, the entire Nihon-buyō world fell into decline. When consumption is restrained, the high cost of Kimono and stage expenses becomes a barrier and

hinders people from participating. Beyond that, the many unspoken customs fostered by the feudal hierarchy and the changing emphasis on children's lessons / extracurricular activities in the industry also contributed to the decline in the younger generation's participation and the aging of the population. Because Nihon-buyō is basically taught through a system of one-on-one training between master and apprentice, it is difficult to pass on skills uniformly to a large group of people as in the school education system<sup>9</sup>, and it takes a long time to build relationships and acquire skills in order to pass on skills. However, skilled Nihon-buyō dancers are aging, and there is a need to pass on their skills to the next generation to keep their outstanding skills alive. The following section will focus on each of the above overviews in detail.

#### 2.4.1 Declining Population of Nihon-buyō

To examine whether the population of people learning Nihon-buyō is decreasing, it is first necessary to divide the population of Nihon-buyō into two categories: those who teach and those who practice. As for the population of masters who teach Nihon-buyō, it should be

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<sup>9</sup> Although the system of training facilities for *Maiko* and *Geiko* in place in *Keihan* (Kyoto and Osaka) called *Nyokōba* is relatively systematic, it does not have a clear instructional code and program like that of school education. Therefore, two points have been pointed out, namely the need to inherit techniques from master craftsmen who have acquired advanced skills and the need for the younger generation to be incorporated and nurtured. However, this situation has not changed even now.

possible to determine the transition in the number of members from the business reports for the most recent six years published by the Nihon-buyō Association. Although not necessarily all Nihon-buyō dancers are members, it can be said to be an indicator to grasp the number of Nihon-buyō dancers who have taken the qualification of *Shihan*. As of March 31, 2022, there were 3,777 members from 110 schools. If the number of schools that have not joined the Nihon-buyō Association is taken into account, the number of existing schools is estimated to be over 200. Although the number of members does not seem to be small, it is certain that the number is decreasing, as a 2008 interview with Nihon-buyō dancers indicates that the number of members was more than 6,000 (Japan Council of Performers' Rights & Performing Arts Organizations 2008, p. 86).

Next, we would like to clarify the details of the population of those who learn Nihon-buyō, but little is known about the population that practices Nihon-buyō as a whole, beyond the boundaries of the schools. It is difficult to assess the number of people learning Nihon-buyō because records of the number of instructors with qualified teaching certificates are kept by each tradition, but the number of students is more complex and includes those who have started learning, those who have learned but do not intend to pursue a teaching certificate, and those who have learned but have not taken a teaching certificate. There is no uniform record or survey that applies to all traditions, and the number of students depends on the understanding and beliefs of each tradition and instructor. There are records of the number of master instructors who have acquired qualifications, but the number of people who learn Nihon-buyō is divided into two types, those who are disciples and those who do not intend to become disciples but are learning. Furthermore, among disciples, there are those who intend to obtain a certificate called *Natori* or become a *Shihan*, master instructor, and those who do not both. Therefore, it is difficult to determine the number of people who learn Nihon-buyō

because there is no uniform record or survey common to all schools, and the extent to which the population is determined and recorded depends on each school and master's opinion.

However, Nihon-buyō artist Seifū Onoe says about the audience of Nihon-buyō: "In Nihon-buyō, the situation has been in place for a long time that the disciples who 'learn' by themselves are essentially the very customers who 'watch' the genre. Other people barely have a chance to touch it." (Japan Council of Performers' Rights & Performing Arts Organizations, 2008, p. 86). Therefore, although the details of the number of people are not known, it is believed that the trend of the population can be known from the trend of the number of performances, since a large proportion of Nihon-buyō performances are in the form of recitals. In this section, we will look at the figures for Nihon-buyō in the broad sense of the term, which includes all three types of *Kabuki buyō*, *Kamigata mai*, and Creative dance. According to the annual statistics in "Geino Hakusho : Suji ni miru Nihon no Geino 1999<sup>10</sup>" (1999) and the "Dento Geino no Genjo Chosa : Jisedai eno Keisho Fukyu no tame ni : Hokokusho<sup>11</sup>" (2008), there were 1,115 days (1,444 times) of performances were held in the country in 1999, while there were 639 days (862 times) of performances were held in 2006. Note that the scope of dances included in Nihon-buyō was changed in the 2006 survey, and while folk dances were excluded from Nihon-buyō, *Ryūkyū buyō* was included. When *Ryūkyū-buyō* is included, the number of performances is 753 days (1005 times), which is 10% of the total number of performances. Next, looking at the figures for Nihon-buyō in the narrow sense that includes *Kamigata mai* and *Kabuki-buyo* as classical dances, we can see a significant decrease from 971 days (1,284 times) in 1999 to 556 days (775 times) in 2002.

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<sup>10</sup> White Paper on Performing Arts: Japanese Performing Arts in Figures

<sup>11</sup> Survey on the Current State of Traditional Performing Arts

The same downward trend can be seen in Nihon-buyō other than classical dances. The number of performances of *Shin buyō* as creative dance was 55 days (57 times) in 1999, but it decreased to 24 days (25 times) in 2006. Since the details of the content of *Shin buyō*, which is a creative dance, cannot be grasped by statistics, the number of performances of unknown genres has increased, but even if these are regarded as *Shin buyō*, the number of performances has fallen by about half compared to 1999. The Japan Council of Performers' Rights & Performing Arts Organizations analyzed the performance activities of Nihon-buyō in the narrow sense as follows.

Despite the fact that organizers other than performers are increasing the number of projects, performance activities have been stagnant more. In particular, with regard to Nihon-buyō, which mainly consists of classical Nihon-buyō, the number of fostering performances, which numbered 455 times in 1999 (including competitions), has dropped to 181 times, less than half of the previous number. There used to be several competitions sponsored by newspapers, but these have now been discontinued, and the number of opportunities for training has been declining. The background to this is that the number of people learning Nihon-buyō has decreased, and inevitably the demand for opportunities to pursue their practice such as competitions has reduced (Japan Council of Performers' Rights & Performing Arts Organizations, 2008, p. 28).

This indicates that the population of those who teach and those who learn Nihon-buyō is on the decline and that the number of performances for the purpose of the presentation is decreasing.

The reason for this downward trend seems to be related to the decrease in physical venues. Nihon-buyō performances are concentrated in Tokyo, where traditional performing arts are actively performed and there are many theaters suitable for performances. As a specific figure, in 2002, about 45% of all performances were held in Tokyo (Japan Council of Performers' Rights & Performing Arts Organizations, 2008, p. 25). *Kabuki buyō*, which was performed in Edo, the predecessor of Tokyo, accounts for a large percentage of classical, and

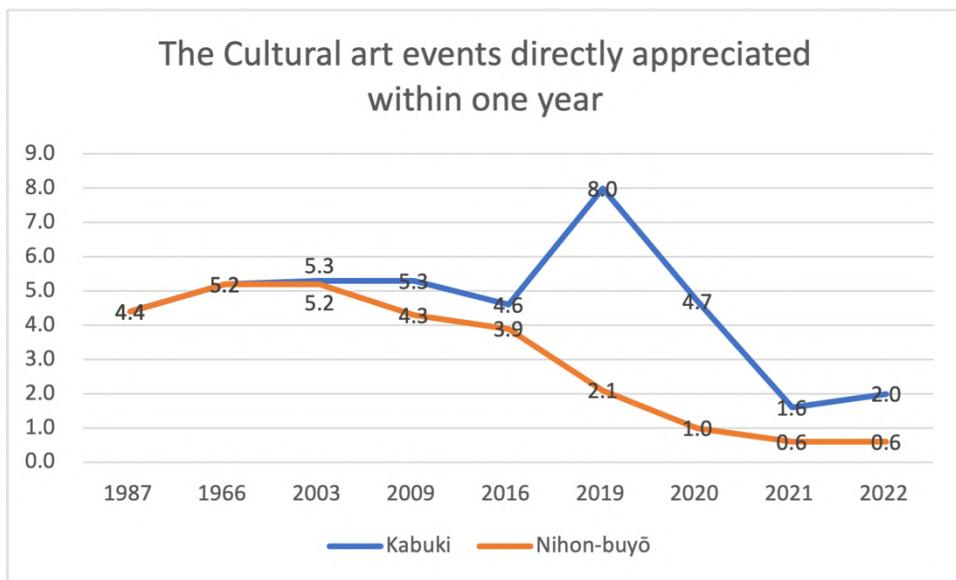
theater with a permanent *Hanamichi* (the elevated walkway that runs through the Kabuki theater), which is used for entering and exiting the stage, in addition to the aforementioned *Shosadai* is desirable as a suitable venue for Nihon-buyō, but such a venue is not necessarily the only place where performances can be held. In recent years, however, the halls and theaters used for Nihon-buyō performances in Tokyo have been closed one after another, and the venues for performances themselves have been lost. Since these venues were private cultural facilities of general corporations, in addition to the decline in corporate patronage of cultural activities, the aging of the facilities necessitated their rebuilding, and the companies either withdrew from facility operations or rebuilt them into other facilities that meet the demand. The decrease in the number of Nihon-buyō performances and the demand for Nihon-buyō as an object of appreciation can be correlated, as those who practice Nihon-buyō are the appreciators of Nihon-buyō. This shows that the population of those who teach and those who learn Nihon-buyō are on the decline, and that the number of performances for the purpose of presentation is decreasing.

#### 2.4.2 Decrease in Popularity of Nihon-buyō as an Object of Appreciation

To clarify whether the demand for Nihon-buyō as a cultural art form to be appreciated is declining, we would like to examine the transition of interest in Nihon-buyō in Japan based on the nine “Bunka ni kansuru Yoron Chosa<sup>12</sup>” conducted by the Agency for Cultural Affairs between 1987 and 2021 (Agency for Cultural Affairs 1987, 1966, 2003, 2009, 2016, 2019, 2020, 2021, 2022). Figure 2 .1 shows the transition of Nihon-buyō and Kabuki in terms of the results of the questionnaire on cultural arts directly viewed for one year. From 1987 to 2003, both trends were almost the same, but Nihon-buyō gradually declined in appreciation, eventually decreasing to about 1/6 of the total. Kabuki, on the other hand, is also in decline, but will show a slight improvement by 2022. The survey on cultural arts that respondents would like to see more of in the future was conducted only three times, from 1987 to 2003 but as Figure 2 .2 shows, Kabuki is on an upward trend, while Nihon-buyō is on a gradual downward trend. Thus, even based on the most recent 35-year trend from the *Shōwa* period to the present, Nihon-buyō has shown a decline in popularity.

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<sup>12</sup> Public Opinion Surveys on Culture

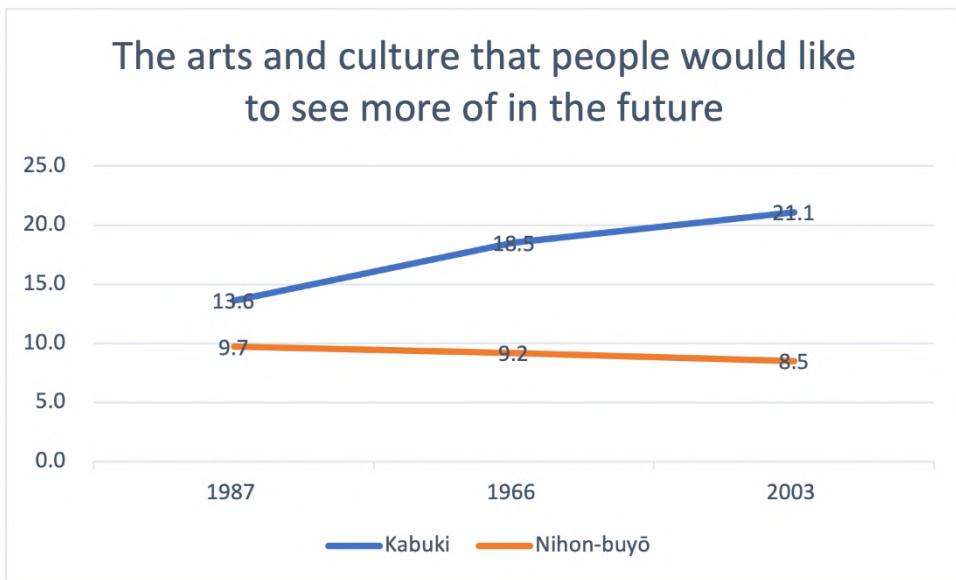


**Figure 2 .1 Number of the cultural and artistic events viewed in person during the year<sup>13</sup>**

Source: Prepared by the author based on “Bunka ni kansuru Yoron Chosa” (1987, 1966, 2003, 2009, 2016, 2019, 2020, 2021, 2022), Agency for Cultural Affairs.

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<sup>13</sup> Kabuki appears to as if it has had a significant increase in 2019, but this is due to Kabuki being consolidated into the Traditional Performing Arts category (Kabuki, Noh & Kyōgen, Ningyō Jōruri, Koto, Shamisen, Shakuhachi, Gagaku, Shōmyō).



**Figure 2 .2 Percentage of respondents who would like to see more cultural and artistic events in the future**

Source: Prepared by the author based on “Bunka ni kansuru Yoron Chosa” (1987, 1966, 2003) conducted by the Agency for Cultural Affairs.

#### 2.4.3 Decline in Media Exposure for Nihon-buyō

The evolution of Nihon-buyō's popularity is also reflected in the degree of exposure it has received on television programs. In this section, we will follow the history of Nihon-buyō on public television programs in Japan. In February 1953, Nippon Hoso Kyokai (Japan Broadcasting Corporation) known as NHK, began broadcasting television for the first time in Japan. Prior to the broadcast of “Terebi Hinoki Butai” (July 1954-March 1959)<sup>14</sup>, various traditional performing arts were broadcast as one-off programs, but this program unified the

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<sup>14</sup> Only four times broadcasted in 1955.

format and integrated them into the genre of traditional performing arts for the first time. As a program that comprehensively introduced traditional performing arts, it was broadcast every other week with a ballet program in the prime-time evening slot. Next came “Buyō Mawari Butai” (June 1956-March 1961), a program that reorganized and adapted the works that had won the *Geijutsu sai shō* (Art Festival Prize) at the 1954 *Geijutsu sai* (Art Festival). This was a program that played an important role for Nihon-buyō as it created a method of staging Nihon-buyō that was suitable for television broadcasting, and elaborated the taste for television. In November 1956, “Terebi Hinoki Butai” was changed to “Terebi Hyakkasen” (November 1956-April 1957), which became a weekly program and gradually became a creative dance program. “Nihon no Geinō” (April 1957-March 1966), the successor program of “Terebi Hyakkasen,” was a 30–40-minute program broadcast on Friday nights as an educational entertainment program aimed at popularizing Japanese traditional performing arts. The content alternated between Noh, Nihon-buyō, traditional Japanese music, and local performing arts, with commentary and highlights of the pieces. One of the long programs was “Geijutsu Gekijō – Nihon no buyō” (May 1960 - March 1963), a 90-minute program broadcast once every two months as part of “Geijutsu Gekijō,” a long-running program on performing arts, which was an introduction to the appreciation of Nihon-buyō. This program systematically categorized Nihon-buyō and aimed to promote understanding and popularization of Nihon-buyō, with commentary in the form of a conversation with the dance critic Kamematsu Matsumoto. After a gap of about 10 years, “Hōgaku Mawarai Butai” (April 1976-March 1982) was born as a nighttime program. It featured Nihon-buyō and *Hō-gaku* (Japanese traditional music) performances, highlighting the best performers of each school as well as hot newcomers, and included interviews with the performers. The program covered classical Nihon-buyō, creative dance, and contemporary Japanese music. “Hōgaku Hyakusen” (April 1982-April 1988), which ran for 45 minutes on Fridays at 9:00 p.m. for six

years, was a program similar to “Hōgaku Mawari Butai” (April 1982-April 1988) that introduced famous pieces of *Hōgaku* with a focus on Nihon-buyō, and also played a role in promoting the appeal and preservation of traditional performing arts. The successor to “Hōgaku Hyakusen,” “Geinō Hana Butai” (April 1988-March 2011) was a long-running program that introduced classical works from various aspects for 22 years, featuring talented performers from various schools, including Living National Treasures, as well as young and mid-career performers. Since then, however, there have been no long-term programs in which Nihon-buyō has been the main attraction, and “Nippon no Geinō” (from April 2011), the successor to “Geinō Hana Butai,” has focused on classical traditional performing arts such as Noh, *Bunraku*, and Kabuki, with only occasional broadcasts of Nihon-buyō. Regarding the TV exposure of Nihon-buyō, Nishikata pointed out, “(Note by the author: 1950s) Since the start of TV broadcasting in this period and the penetration rate of TV in general households was low, the influence of TV culture was small. However, when I watch the current TV programs, I want to clearly state that incomparably many hours were devoted to Nihon-buyō” (Nishikata 2006, p. 654). The fact that the number of Nihon-buyō directly appreciated has been declining since the end of the “Geinō Hana Butai” broadcasts suggests that there is a correlation between media exposure and the number of viewings. Comparing the situation of Nihon-buyō in the past, when demand was high, with that of Nihon-buyō today, it was found that media exposure has declined, indicating the effects of the decline in popularity.

#### 2.4.4 Cost of Nihon-buyō

During the economic boom times before the 1980s, it was more common for Japan's population to spend frivolously, but the trend has changed significantly due to the economic downturn, leading to a relatively increased financial burden on Nihon-buyō performers and

those who learn Nihon-buyō, and a change in people's consumption awareness and behavior. There are various reasons why people shun Nihon-buyō, but this section will focus on the financial aspect in more detail. According to interviews with Nihon-buyō practitioners, the cost of learning Nihon-buyō includes monthly fees ranging from 10,000 yen to 30,000 yen, plus the cost of gifts that are recommended to be given at events. In addition, there is a minimal cost to purchase several pieces of Kimono and *Yukata*. In addition, if one wishes to become a *Natori* or *Shihan*, which is a licensing role in Nihon-buyō, the certification fee is around 500,000 yen, and more than 1 million yen is required for the showcase that must be held after the certification. In order to present one's Nihon-buyō skills in a recital, it is necessary to rent a costume and a wig for dancing from costume stores or have them custom-made, which can cost from 300,000 to over 1 million yen per program, depending on the content of the program and the size of the stage. In addition, if a piece requires costume changes on stage or props, a helper called a *Kōken* must be hired, and if the performance is performed live instead of playing a recorded tape, it is necessary to pay for the performers who play the shamisen and sing, who are called *Jikata*. In some cases, a matching custom-made Kimono is required just for one presentation, and the Nihon-buyō practitioners must be prepared to incur high expenses in this case.

For practitioners of Nihon-buyō, it is recognized as a matter of course that these costs will be incurred, but it can be said that the cost of Nihon-buyō is a large monetary burden compared to the cost of general lessons as hobby or extracurricular activities. An examination of income and expenditures per household per month according to the first table of the 2021 Household Survey by the Ministry of Internal Affairs and Communications shows that the actual income of working households was 522,572 yen and the actual expenditures were 360,457 yen. Looking at the income separately, the income of the head of the household is 409,088 yen, while the income of the spouse of the head of the household is 60,651 yen, and

the income of the female spouse of the head of the household is 58,871 yen. Among expenditures, 24,887 yen is allocated for education and entertainment, including 2,636 yen for monthly fees and other expenses. Considering the average household income and expenditure in Japan today, the financial burden that Nihon-buyō as a form of learning places on Nihon-buyō practitioners cannot be said to be light. Furthermore, let us consider the Kimono, which is indispensable for Nihon-buyō. I referred earlier to the cost of the costume, *Hon ishō*, for recitals but since most Nihon-buyō instruction is done in wearing *Yukata* or in unexalted Kimonos worn on a daily basis, these expenses should also be considered. A look at the trends in the amount of spending on items of Kimono, in which spending on *Yukata*, *Furisode*, *Hakama*, *Jinbē*, Kimono coats, *Haori*, and *Obi* for Kimono are counted, shows that people have been spending less and less from the early 2000s to the present. Overall consumption of clothing, including *Wafuku* (general Kimono and the aforementioned Kimono related items), was 195,110 yen in 2002, but declined to about two-thirds in 2018, to 137,451 yen. Although the overall consumption of clothing is declining, the amount of expenditure per household for *Wafuku* was 7,952 yen in 2002, but declined to about one quarter in 2018, to 2,094 yen. The rate of decrease for *Wafuku* is large (Statistics Bureau Ministry of Internal Affairs and Communications, 2020). The consumption of clothing as a whole, including Kimonos, was 195,110 yen in 2002, but by 2018 it had decreased to about two thirds, reaching 137,451 yen, indicating that there is certainly a downward trend in overall clothing consumption. However, even so, the amount spent per household on Kimonos is still 7,952 yen in 2002, while in 2018 it was 2,094 yen. This represents a decrease of about a quarter, demonstrating a significant drop in Kimono consumption (Statistics Bureau, Ministry of Internal Affairs and Communications, 2020). In contrast to this expenditure amount, the average price of one women's Kimono as of November 2022 was 309,097 yen, according to the Survey of Retail Price Statistics, Statistics Bureau Ministry of

Internal Affairs and Communications. Although there is little need to order new Kimonos for daily practice, even the average amount for a Kimono not for stage use is approximately 150 times the annual Kimono expenditure, indicating that the financial burden is significant. The small amount of money spent on Kimono also shows that the Kimono has lost its presence as an everyday garment in modern Japan, and in recent years many people are unable to wear Kimonos themselves. The decrease in the number of people going to Nihon-buyō practice, which used to be one of the opportunities to wear Kimono, and the decrease in the number of Osarai kai, daily recitals to show their skills, have also had no small influence on the decrease in the amount of Kimono consumption. Thus, the discourses about Nihon-buyō as a form of learning, such as “Nihon-buyō is expensive” and “*Osarai-kai* (recital) is expensive,” are true because they exceed the amount of money people expect to spend for their lessons.

#### 2.4.5 Problems with Education

The capacity problem arising from the teaching method of Nihon-buyō is one of the causes of stagnation in the transmission of Nihon-buyō techniques. In general, the usual method of passing on the art of traditional performing arts, including Nihon-buyō, is for a master to train his/her apprentice, and the Japanese headmaster system, called the *Iemoto* system, consists of a feudalistic top-down hierarchical structure in which those who have been recognized with a certain level of evaluation by the headmaster, or *Iemoto*, are given the qualification of *Shihan*, or *Natori*. Once a dancer has received a license of *Shihan* from the *Iemoto*, he or she can open his or her own Nihon-buyō class under the name of the school, and as a master, he or she invite people who want to learn Nihon-buyō to become his or her apprentice.

However, one of the concerns for those who learn Nihon-buyō is that they do not know the personality of the master and his or her teaching style until they have studied for a while.

Basically, when learning Nihon-buyō, one can only study under one master, so it is impossible to know whether the master is skilled in teaching or not by comparing him or her with other masters before becoming an apprentice.

In addition, the master himself or herself has not learned the teaching method from someone else, but from the master as he or she has learned it, so the quality of the teaching varies, and there are few opportunities for the master to learn how to improve his or her own teaching method. Furthermore, in Nihon-buyō classes, the master is the only one who teaches and often the only one who manages the class, so there is a limit to the number of students who can be taught even if the day is maximized, and it is difficult to maintain the balance and quality between teaching and performing activities when performance time is taken into consideration. For further research on person-to-person transmission from master to apprentice and the lack of a producer and management system as a business, see Okada et al.'s (2016) "Research on a Sustainable Foundation for Japanese Traditional Dance: Toward the Revitalization of Performing Arts Activities."

Nihon-buyō is basically taught in a system of one-on-one training between master and apprentice, making it difficult to pass on skills uniformly to a large group of people as is done in a school education system. Moreover, since each school and each master teach in a different way, there is no systematic uniform way of teaching. In terms of what one learns, after the basics have been taught, the teacher and the student discuss and decide which dances to learn based on the student's level of dancing, age, and the repertoire for performance, among other considerations. As a result, even if two beginners start learning the same style of Nihon-buyō at the same time, it is possible to imagine that the repertoire they can dance will differ. On the other hand, *Hōgaku*, which is often compared to traditional Japanese music because of its relatively similar nature within the framework of traditional performance arts, has had its treatment in instrumental music education in the music department revised in

1998. National curriculum standard for the elementary school, added a description stating, “With regard to instruction on Japanese instruments, efforts should be made to experience one or more types of instruments over the three grades” (Ministry of Education, Science, Sports and Culture 1998, p. 63). Furthermore, to foster in children a respect for traditional Japanese music, a more detailed description was added saying, “With regard to instruction on Japanese instruments, efforts should be made so that the students can experience the value of traditional music of Japan and the local area through music-making activities for one or more types of instruments over the three grades” (Ministry of Education, Culture, Sports, Science and Technology, 2018, p. 105). This has provided an opportunity for more exposure to traditional Japanese music in school education. It has also increased the interest of the younger generation. The reason why traditional Nihon-buyō is not included in school education is partly because incorporating just one particular school of Nihon-buyō can raise political issues, and partly because it may not be compatible with the school's physical education and music system. However, to gain recognition from the younger generation, it should be necessary for traditional Nihon-buyō to be included in school education.

#### 2.4.6 Conventional Theories

Let us review the above overview and confirm the conventional theories about Nihon-buyō. Originally, Nihon-buyō was one of the most popular forms of necessary accomplishments for children, and had a dominant position in the training market. Details of this can be confirmed in “Kazuramaki Masaoki Nikki Nohgaku Kankei Kiji kō<sup>15</sup>” (1719), and

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<sup>15</sup> Articles Related to Noh Derived from Diary of Kazuramaki Masaoki

Samba Shikitei's "Ukiyoburo" (1909), which describes the customs of the late Edo period, shows that *Odori*, *Shamisen* (Japanese three-string musical instrument), and *Koto* (long Japanese zither) were the most common forms of practice. However, as the times changed, cultural lessons from Western culture became increasingly popular, and the piano and other instruments became gaining popularity as girls' lessons (Kataoka 2019, pp. 269-274).

Therefore, it can be said that Nihon-buyō was forced to enter into a fierce competition with other genres of accomplishments in Japan, where practices were flourishing. Sakamoto (2002) notes that while the practice is essentially the adult education of a daughter entrusted by her mother to another person called *Shishō* (master) and is a traditional training for future brides that focuses on the acquisition of manners and social common sense, the practice of Western music is connected to vocational education at the Tokyo of Academic of Music, and is intended to enable professional independence as a professional Western musician. This emphasizes the fact that even if both pursuits entail artistic training, they have completely different foundations (Sakamoto 2002, p. 67). This can be considered the reason why Japanese traditional lessons have been pushed aside by Western ones. As time goes by, as values and needs change, and as the generations of people who were familiar with Nihon-buyō change, the percentage of people who choose Nihon-buyō as a method to gain important accomplishments has decreased due to changes in people's economic conditions, the diversification of artistic pursuits, and the amount of money they can spend on learning, especially for the younger generations. In light of this, it can be predicted that the younger generation in particular has had few opportunities to become familiar with Nihon-buyō, which was not part of their school education.

#### 2.4.7 Consideration Using Cultural Capital Theory

Based on previous discussions, it is understood that the factors that are said to have led to the decline of Nihon-buyō are primarily changes in the environment caused by changes in the era. However, it is not clear why Nihon-buyō, compared to other traditional practices such as tea ceremony and flower arrangement that were also considered children's hobbies, is often considered to be particularly declining. To shed light on this, based on the research of Bourdieu and Kataoka, I would like to propose a possibility of a decrease in the utility of Nihon-buyō for children compared to the time when Nihon-buyō flourished as a lesson by considering the acquisition of culture through accomplishments by cultural capital theory.

Nihon-buyō can be considered to belong to two types of cultural capital, institutionalized cultural capital and embodied cultural capital, among Bourdieu's three types of cultural capital, economic capital, and social capital (*capital culturel*, *capital économique*, and *capital social*). The act of learning Nihon-buyō has the function of acquiring embodied cultural capital through Nihon-buyō, and if recognized by Iemoto as a *Shihan* or *Natori* and granted a certificate, one can also acquire institutionalized cultural capital. For women, who could not participate in the competition for position in the public sphere as men did and had to remain in the private sphere due to social restrictions, acquiring cultural accomplishments and turning themselves into cultural capital was a strategic means to marry a man with economic capital and to bring social capital to themselves and their families and it was a method for women's success in life. This was true not only for the daughters of the warrior class but also for the daughters of the merchant class, who, by transforming themselves into cultural capital through the acquisition of accomplishments by training, were able to acquire professional status (to work as a domestic servants) and overcome class status. Women who married and became wives passed on their culture to their daughters in the home and taught them various practices, investing in culture beyond educational purposes and reproducing cultural capital between generations of parents and children.

Therefore, it can be argued that, women have been oppressed within a patriarchal society, and it was considered socially acceptable for them to remain within the household and perform traditional roles such as housekeeping and childrearing. As a result, the widespread notion of what constitutes an ideal woman was deeply ingrained in society, and it was common for parents to have their daughters participate in traditional cultural practices such as Nihon-buyō. In the U.S., however, this concept changed with the entry of women into society due to the war. Women had been engaged in domestic labor within the private sphere of the home, but with the absence of men, they gained experience of economic independence through work in the public sphere and social involvement. Then, the second wave feminist movement that took place in the 1960s and 1970s produced an active and diverse image of women. Freeing themselves from what society had demanded of them in terms of femininity and what they should be, an increasing number of middle-class women sought women's rights and equality both physically and socially. In Japan, however, there are still many aspects of femininity that are socially demanded of women, and since women are expected to do double duty as good mothers who give birth and raise children while also advancing in society, the profession of a teaching, that is becoming a *Shishō* of traditional performing arts, as cultural capital by the system, is capable of fulfilling both of these demands. Thus, the demand for traditional performing arts as a form of institutionalized cultural capital was relatively high until the *Shōwa* period (1926-1989), as it did not create a conflict between the acquisition of education and training required of girls and the acquisition of a profession.

However, as times have changed, the corresponding cultural capital has also changed. In contemporary Japanese society, women are now entering the same academic society as men, and the role of cultural capital as strategic cultural capital for acquiring economic capital that it once played is diminishing, and the demand for cultural capital that can generate revenue at schools for English, programming, etc., which are considered more practical in society, is

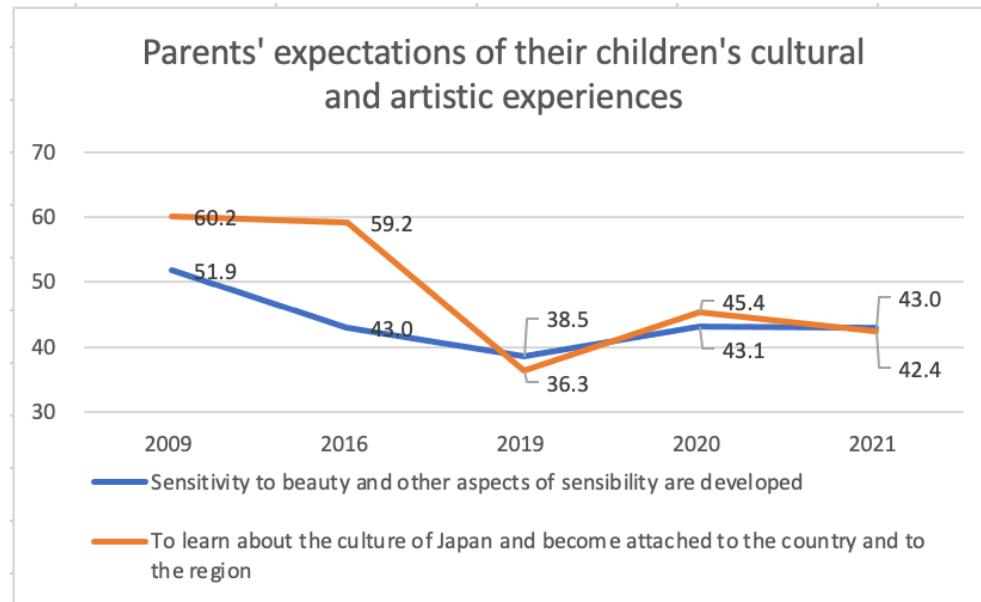
increasing (Kataoka 2019). The demand for cultural capital that can generate income in schools, such as English and programming, which are more practical for society, is increasing (Kataoka 2019). The fact that many children quit Nihon-buyō after the fourth grade (Japan Council of Performers' Rights & Performing Arts Organizations, 2008, p. 81) may be influenced by the fact that Japan is an education-oriented society. The recent trend in Japan to emphasize the acquisition of academic credentials is due to the fact that competition for junior high school entrance exams is intensifying in urban areas, and it is common for children to attend cram schools for entrance exams from the fourth grade of elementary school. From this, it can be inferred that many parents today place greater emphasis on studying for entrance exams to acquire academic capital than on acquiring embodied cultural capital, such as Nihon-buyō.

According to Kataoka (2019), Japanese hobby activities are composed of three different types of hobby activities from those presented by Bourdieu: traditional art hobbies, Western culture hobbies, and popular culture hobbies. Traditional art hobbies, which are hobby activities related to various traditional Japanese arts, are hobbies established against the background of high economic capital and correspond to bourgeois luxury hobbies in Bourdieu's analysis (Kataoka 2019, p. 105). On the other hand, Western cultural hobbies, such as listening to classical music and playing the piano, are hobbies found in groups that seek to enter the ruling class through the acquisition of academic capital (Kataoka 2019, pp. 105-107). Finally, there are popular culture hobbies of low prestige in the middle and lower classes, which function to conceal the existence of symbolic boundaries of culture as a cross-class common culture accessible to all (Kataoka 2019, p. 145). Popular cultural hobbies are the opponents that Nihon-buyō competes with as entertainment, but if Nihon-buyō in a broad sense, which is entertaining and popular, succeeds in positioning itself in popular culture, in a narrow sense may also benefit from it.

It is unfortunate for Nihon-buyō that the non-performing entities that used to provide financial support have withdrawn, and that a severe decline in perceived necessity has changed the situation for the population that learned Nihon-buyō, making it difficult to continue, return, and reproduce intergenerationally to their children. Bourdieu states that it is not enough to learn the culture in school in order to be able to understand the authentic taste, but that the acquisition of culture, including parental practice and one's own childhood experience, requires both economic space and time for cultural accumulation, which he defines as “distance from necessity” (Bourdieu 1979). In other words, the advantage that Nihon-buyō has had in the past, that it is a culture of high “distance from necessity,” has been reversed today. To give an overview of the economic history of Nihon-buyō from the perspective of patronage, the Nihon-buyō industry suffered from the postwar dismantling of industrial conglomerates and other patrons that had supported Nihon-buyō economically. Yet although Nihon-buyō was able to benefit from corporate patronage of cultural activities when the Japanese economy entered a boom period, after the collapse of the bubble economy, it was unable to receive the continuous support that it used to be. In addition, the newly educated class that supported the economic growth of Japanese society is choosing to invest in Western cultural practices for their children, and the acquisition and transmission of the embodied cultural capital of Nihon-buyō is being lost. One of the reasons for this is that the Japanese family has become increasingly nuclearized, and the common habitus between families and generations is fading away.

In today's Japan, where academic background is more important than ever, the appealing copy of Nihon-buyō may no longer be effective, especially for the younger generation and parents with children. According to a public opinion survey by the Agency for Cultural Affairs, over the past 10 years there has been a decline in the two items that are considered to

be the appeal points of Nihon-buyō classes in terms of the effects that parents expect from their children's cultural and artistic experiences (see Figure 2 .3).



**Figure 2 .3 Expected Effects on Children's Cultural and Artistic Experiences**

Source: Prepared by the author based on “Bunka ni kansuru Yoron Chosa” (2009, 2016, 2019, 2020, 2021) conducted by the Agency for Cultural Affairs.

In addition to the problems of declining population and declining attractiveness as a leisure industry, I believe that changes in the valuation of cultural capital and changes in the upper class have also had an impact on Nihon-buyō. The types of cultural capital that were favored by the traditional upper class and the newly emerging upper class were different, so the value of Nihon-buyō as cultural capital may have changed from when it was used directly as a capital transfer through marriage. Nevertheless, Nihon-buyō has managed to maintain its value as embodied cultural capital. In the future, however, it will be difficult to maintain a community to preserve and nurture Nihon-buyō unless we can broaden its base to include foreigners and Japanese who are not familiar with Nihon-buyō. Of course, there will be a variety of opinions about the attitude toward transmission among Nihon-buyō practitioners,

ranging from conservative to open toward change. As an example, let us take the attitude of different schools of *Kyōgen*. There are two remaining schools of *Kyōgen*: the Izumi school and the Ōkura school. The Ōkura school is the oldest school of *Noh gaku*, which has inherited *Kyogen* from the main school of *Saru gaku*. Of the Ōkura school, the Tokyo-based Tojiro Yamamoto family and the Kyoto-based Sengoro Shigeyama family are diametrically opposed in their approach to *Kyōgen*. The third generation of the Tojiro Yamamoto's family left behind the family motto, “Sticking to our art and perishing is better than messing it up our art and becoming popular,”<sup>16</sup> and never performed any new *Kyōgen* created after the *Meiji* period. On the other hand, the Sengoro Shigeyama family continues to perform “Otofu *Kyōgen*,” a form of *Kyōgen* that can be casually invited to perform and easily seen by people who say, “Whenever we are in need of entertainment, let's try Shigeyama's *Kyōgen*.”<sup>17</sup> Due to this, the Sengoro family performs a new piece of *Kyōgen* every month. The words of Tojiro Yamamoto III are a stance that practitioners who respect tradition can agree with, and the diversity of this stance should be respected, but the fact is that the Sagi school, which should have been the third school of *Kyōgen* that once existed, was unable to adapt to the changes of the *Meiji* era and perished. In order to preserve the traditions and preserve them for the future, it is necessary to find ways other than the transmission of traditions by people. In this study, I would like to use the framework of cultural resources to consider what kind of activities are

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<sup>16</sup> Okura ryu Kyogen Yamamoto ke, “Okura ryu Kyogen Yamamoto Jirou ke,” n.d., accessed November 28, 2022, <https://www.kyogenyamamoto.com/about.html>.

<sup>17</sup> Otofu Kyogen Shigeyama Sengorou ke, “Otofu Kyogen to wa,” n.d., accessed November 28, 2022, <https://kyotokyogen.com/about/otofu-kyogen/>.

necessary for Nihon-buyō to continue to exist and be passed on to the next generation, despite the enormous and difficult-to-solve problems it faces.

### 3 Considering Nihon-buyō as a Cultural Resource

#### Cultural Resources and Cultural Resourcing

In defining what a cultural resource is, the objects that the two words culture and resource can categorically include are so broad that almost anything can be considered a cultural resource. However, this makes it difficult to discuss using the concept of cultural resources.

The Association for Study of Cultural Resources describes cultural resources as follows

Cultural resources are a whole source of valuable materials that provide a clue to the society and culture of a particular era. We call this a cultural source. Cultural sources include tangible and intangible items, such as buildings and urban landscapes that cannot be stored in museums or archives, or traditional performing arts and festivals. However, many materials are stored, consumed, unused, and forgotten. It is necessary to regenerate and process the vast amount of buried resource materials so that they can be used in the present and future society, and to resource the materials to foster a new culture. (Japan Society of Cultural Resources 2002).

From this explanation, it can be understood that in cultural resource studies, cultural sources are approximately cultural resources, but only a limited number of cultural sources can be resourced. In theory, almost anything can be a cultural resource, but in reality, a cultural resource can be defined as a cultural source that is resourced by some entity through a dynamic opportunity such as development or utilization. This suggests that the process by which an object is recognized and utilized as a resource is more important than the fact that it is a cultural resource, as it is recognized and given some value by an entity. In other words, cultural resourcing is the process of taking an object that is already a resource and inserting it into a different context, thereby giving it a new meaning, and making it a resource by bringing its latent properties to the surface (Moriyama 2007a, pp. 60-62).

Within this definition of cultural resources, here we treat digital cultural resourcing as those cultural resources that have been specifically resourced digitally. Digital cultural resources can be thought of as digitalized cultural resources as a way of preserving something that exists only here and now, such as performing arts, or in this case, Nihon-buyō.

Moriyama (2007b) proposes a fourfold questioning mechanism regarding “who” has resourced culture as a way to analyze the process of cultural resourcing by focusing on the dynamic process of who is the main actor in the resourcing of cultural resources. This mechanism highlights the relationship and political nature of the actors involved in cultural resources by clarifying the four questions: (1) who is resourcing, (2) whose culture is being resourced, (3) whose culture it is being resourced as, and (4) at whom the resourcing is targeted.

If we apply the fourfold question of “who” to the cultural resourcing of Nihon-buyō so far, we can arrive at the following four respective answers: (1) the practitioners, the state, and corporations, (2) the culture of the practitioners (= the culture of some of the people, meaning Japanese), (3) the culture of the practitioners, the culture of the people in general, the culture of Japan (in comparison with other cultures), (4) people who are within the same cultural norms (i.e., those who practice, those who are educated to understand the culture, other dance groups, the public, those who do not share the same cultural norms, and those who do not share the same cultural norms), the people who do not share the same cultural norms (i.e., not in the same specific Japanese culture, not educated, not familiar with it), and people from other countries who belong to a different culture.

On the other hand, in this research aimed at digital resourcing of Nihon-buyō, it is predicted that the answer to the applied mechanism will change as follows: (1) the practitioners, (2) the practitioners' own culture, (3) as the practitioners' culture, (4) and as the culture of Japan (compared to other cultures), and the resourcing will be aimed at the digital

world, (i.e., everyone who can be reached on digital platforms). The digital resourcing of cultural resources, including Nihon-buyō, can improve the availability compared to before digitization, as it opens up the possibility of access to all people, both in Japan and abroad, and to future generations to come.

### Resourcing and Gaze

When an object is transformed from a static state of being a cultural resource into another cultural resource, active and passive actions are generated by being exposed to the gaze of others. Moriyama described the strategic self-presentation of a subject through being seen as follows

When subjects become aware of the gaze how they are being “seen” from outsiders and transform that “viewed” into something they can “show,” the opportunity to “make their <culture> a <resource>” is dynamically activated, and a certain leap is triggered to “make what is a <resource>” a higher level “resource” (Moriyama 2007a, pp. 65-66).

In this way, by gazing and being gazed, at a glance the passive act of being seen changes into an active effort of showing how one is seen, and the active act of seeing reverses into the passive act of being shown.

The relationship between the gaze and Orientalism, which is often raised in discussions of the gaze theory, will lead to the same conclusion as Yoshinobu Ōta's objectification of culture, which was proposed as a concept similar to cultural resourcing.

Briefly expressed, the objectification of culture is the new creation of culture as an object that can be manipulated. In the process of such objectification, selectivity naturally comes into play. In other words, it is necessary to select elements that can be presented to others as the culture of a people. As a result, the selected culture, even if

it is an element that has existed continuously from the past, cannot have the same meaning as the original context due to the fact that it was selected for objectification. ....This means that there is no such nature of being as a traditional cultural element. The “culture” created by the objectification of culture is a selective and interpreted entity (Ōta 1998, pp. 72-73).

From Ōta's argument, we can see that objectified culture is a selected and interpreted entity, and that values are transformed from the pre-objectified culture by the gaze from outside the culture, and this is not limited to Orientalism, which is the gaze of the West toward the non-West.

Here, I would like to mention the gaze of digital cultural resourcing. In creating the motion of Nihon-buyō in this study, the participants, Nihon-buyō dancers, raised the question of whether the motion should be emphasized more than it should be, or whether it would be better to devise Nihon-buyō that is performed when teaching the choreography to students rather than devising Nihon-buyō that is performed when dancing on stage. I think this kind of idea may have been born in them as result of the awareness of having the motions recognized by computer vision, and the idea that the Nihon-buyō dancers should make the movements easier to understand and emphasize when teaching Nihon-buyō to their students, rather than when dancing for performances. It should be noted that the data to be filmed in the future with the assumption of three-dimensional digital cultural resourcing may change slightly from the original performance when compared to the normal recorded video.

## Partial Resolution of Difficulties in Recording and Describing Dances through Digital Cultural Resources

Dance can be considered one of the most difficult cultural art forms to capture and describe. Although the physical expression of moving the body to the rhythm of music is not

necessarily an act that requires training, there is no established definition of what constitutes dance and no established methodology for talking about dance with others. Tamotsu Watanabe argues that Nihon-buyō tends to be viewed as a closed and difficult-to-enter domain without traditional knowledge of the rules of etiquette and engagement, but he believes that Nihon-buyō has the universality of dance that is shared by other Western and contemporary dances, and that this universality is hidden by the obstacles in the phenomenon of dance (Watanabe 1991, p.3). These obstacles are the lack of a definition of dance, the indefiniteness of its domain and its closure, and the lack of a methodology for talking about dance, which are all the more difficult to resolve because dance is an art form that disappears instantly upon performance.

However, attempts to preserve dance techniques that disappear momentarily have also been sought in methods other than the dancer's body as a medium. Examples of attempts to record dance include "Orchésographie" published by Toinot Arbeau in 1589 and "Labanotation" devised by Rudolf Laban in 1926, which have been practiced in a variety of ways. Although the basic method of teaching Nihon-buyō is oral transmission from masters, according to "Hyojun Nihon Buyo fu" (ed. the Tokyo National Research Institute for Cultural Properties 1966), there are three types of notations: pictorial, symbolic, and word notation. It can be said that these methods of dance notation have played a supplementary role in the transmission of the dance.

However, written, photographic, and visual records do not provide the same experience of re-experiencing a dance as actually seeing it. For this reason, it seems that the discourse that one must actually experience a dance in real life in order to fully appreciate it seems to have taken hold. However, not only dance, but other art forms such as musical performance and physical performance can be reproduced through means of video recording, even though the visual and auditory information may not be as complete as the actual experience. However,

viewing a performance in the place where it is performed causes phenomena other than visual and aural information that are considered important in viewing the performance. For example, the power of the performance, the atmosphere of the place, and the emotions that arise in the viewer's psyche as a result of watching the performance.

At present, photographs and video recordings for the purpose of art appreciation are unable to provide the same sensory and psychological experiences as actual performances, but I believe that efforts should still be made to improve them or to develop value-added creations that cannot be obtained through actual appreciation. With the rapid development of digital technology in recent years, photographs and videos created with CG, and human speech reproduced by deep learning, are becoming so accurate that it is difficult to distinguish between real and artificial. The day when it will be possible to experience the emotions of appreciation from digital archives seems not far off.

### Why Use Cultural Resource Theory to Approach Nihon-buyō?

There have been many efforts by Nihon-buyō practitioners to promote Nihon-buyō, and their enthusiasm and sense of mission are extraordinary. The appeal of Nihon-buyō as a traditional performing art or cultural art experience has been promoted not only by organized groups such as the Nihon Buyo Association, the Nihon Buyo Foundation, and the Nihon Buyo 21, but also by individual Nihon-buyō practitioners. However, in light of the continuing decline in popularity and population from the *Shōwa* period to the present, it may not result in a comprehensive solution unless the structural issues of Nihon-buyō are addressed and it is made accessible to a wider audience and regains its popularity.

To make the passion of Nihon-buyō practitioners more effective, it may be necessary to acquire new options beyond conventional means and to create a foundation for the further

development of Nihon-buyō in the future. As a way to achieve this, I would like to advocate the digital cultural resourcing of Nihon-buyō by the practitioners themselves. The digital archive of two-dimensional information of Nihon-buyō ranges widely from the records of the Human National Treasures of dance to those who learn Nihon-buyō as a hobby, and by utilizing these cultural resources, Nihon-buyō can be resourced into three-dimensional digital data. However, in order to revitalize the world of Nihon-buyō, I believe that we should not only preserve the recorded materials of Nihon-buyō as a digital archive, but also transform them into cultural resources and make them accessible in the digital world to induce creation and communication.

### 120 Years of Nihon-buyō Video Recordings

It is evident that Nihon-buyō, which has been recorded through many photographs and videos, is being stored as digital data not only from the beginning as born digital data created as digital data but also from analog materials that are being digitized. This indicates that museums and libraries are pursuing accessibility and availability of information through digital archiving. Among recorded images, those that are publicly recorded and preserved are stored in the Traditional Performing Arts Information Centre and the Bunka Digital Library operated by the Japan Arts Council, Independent Administrative Agency. However, recording media such as VHS are tangible and there is a possibility of degradation and damage. In the case of Japanese traditional music, which is also used in Nihon-buyō rehearsals and recitals, SP recordings from the early 1900s to 1950s have been digitally archived and are stored as historical recordings collection, known as Rekion in the digital collection of the National Diet Library. However, recording media such as VHS are tangible, and there is the possibility of deterioration and damage. Of course, simply digitizing the

material does not permanently solve the preservation problem, as digital data still depends on the recording media, and if any problems arise with the servers that store the data, it is still at risk of disappearance, but the data can be more easily replicated and stored in multiple ways, so the risk can be spread in comparison to analog data.

One reason why there is a large amount of video materials of Nihon-buyō is that performers such as Geisha and *Maiko* were selected as photogenic subjects for photography and film. The first video of Nihon-buyō was taken in 1894 of a geisha dancing in the Gion district of Kyoto (see Figure 3 .1). This Nihon-buyō was created for foreigners and does not contain much of the traditional dance scene, and those of us with modern values may feel uncomfortable with the fact that it was recorded as a dance of a *Geiko* in Gion. However, it is noteworthy that various types of video records that provide information on the evolution of Nihon-buyō have been accumulated for more than 120 years.



**Figure 3 .1 Illustration of Sarashi nuno Dance by Three Geiko in Gion Shinchi, Kyoto.**

Source: *Imperial Nihon-buyō*, Dickson, W. K.-L., Film Producer, William Heise, Inc Thomas A. Edison, and Afi/Holt, performed by Sarashe Sisters [United States: Edison Manufacturing Co, 1894] Video, accessed October 18, <https://www.loc.gov/item/00694125/>.

There are many types of Nihon-buyō recordings, including videos taken for archival purposes and photographs and videos made for viewing purposes. One type of Nihon-buyō footage that was accessible to the general public was the Nihon-buyō programs broadcast on

NHK. However, the images produced for appreciation purposes do not necessarily contribute to the digital cultural resourcing for the transmission of more detailed techniques. The video records so far include: the recorded images stored by Nihon-buyō practitioners for their own record and commemoration, which are not available to the public; dance programs produced for the general public for entertainment consumption or educational purposes in television programs; and videos emphasizing the beauty of the dance and dancers and placing emphasis on artistic value. However, it is important to note that in many cases, among the above three categories, it is only the recordings taken by Nihon-buyō dancers themselves that can be used to estimate the three-dimensional motion at present. This is because the videos are basically recorded with a fixed installation so that the entire stage can be seen. In other cases of videos, the scene where the dancer's face is zoomed in and other parts of the body, especially the lower body, are not shown at all, making it impossible to estimate. Furthermore, when the camera follows the moving dancer on stage or zooms in, it becomes extremely difficult to obtain the information of dancers' position on the stage and each body parts. Additionally, dance videos that have been edited and processed for viewing often have trimmed parts of the scenes that may seem monotonous to viewers, making it impossible to complement the position of the body between scenes and to obtain complete three-dimensional data of a dance piece. Although many of the video records owned by Nihon-buyō practitioners contain the necessary information to make the dance three-dimensional, in interviews with Nihon-buyō practitioners, they rarely look back at them and keep them only as mementos. Thus, it is lamentable that most of the visual materials that could be resources for the Nihon-buyō world are kept in dead storage.

What Cultural Resourcing Reveals and Uncovers

Cultural resourcing opens up a great deal of potential in some respects, but in others it masks aspects of the resource. The process of transforming a cultural resource from simply existing without being seen or cared about, or with the possibility of being discarded, to a state of accessibility and availability that can be seen by others and used in a new context with a new value attached to it. This is one of the many advantages of cultural resourcing cultural resources. On the other hand, there are elements of cultural resourcing and digital cultural resourcing that should not be overlooked. First, when an object is made into a cultural resource, the intention of the person who made it into a cultural resource intervenes. In many cases, this decontextualizes the object from the context in which it originally existed and gives it a different value and meaning, which can have a different impact and change the consciousness of the people who have nurtured the cultural resource. While this change can vary from positive to negative, it should be noted that cultural resource decontextualization is irreversible, as the changed values of the people cannot be restored to the values they had prior to the cultural resource decontextualization.

Next, I will point out that while there are areas in which cultural resources using media recording and digital technology can be very vivid and clearly depicted, there are also areas in which the aspect of the subject is overshadowed. If the archiving entity chooses not to preserve something, it will not be recorded, and in the future, there is a possibility that what was not recorded will be deemed to have never existed, and what was not recorded can only be supplemented by imagination. However, even if an attempt is made to record a certain object, it is difficult to record it completely. This is because it is not possible to fully record all real events on information media due to three reasons: things that cannot be recorded by nature, intentional non-recording, and unconscious oversights. When dealing with cultural resources, it is necessary to be aware of the political viewpoint of what has been preserved and what has been eliminated.

The same can be said for digital cultural resourcing. If only a digital cultural resource creation effort is undertaken by technicians, there is a possibility that some elements that are important to the Nihon-buyō practitioner or to the Nihon-buyō business will not be taken into consideration for digital cultural resourcing or digital archiving. It can be said that once a form is created that is considered standard, the record tends to be perceived as a representation that has authenticity by those who are not engaged in the subject. The danger is that among the information that is consciously or unconsciously recorded, events and objects that are presented without any dynamic effect, and some parts of the everyday world for people in the context to which they belong, can be lost.

The two most predictable constraints on digital cultural resourcing by individual Nihon-buyō practitioners are the problem of technical capability and the problem of cost. However, technological constraints and the financial burden of equipment have been reduced due to technological advances and generalization. The resourcing of Nihon-buyō is valuable not only in terms of the digital cultural resources that will be newly recorded in the future, but also in terms of the possibility of discovering information that could not be recorded or discoveries that had not been noticed before from the cultural resources recorded under the existing constraints. When considering this process of cultural resourcing, it is necessary to reflect on what changes may occur and to understand the political context in which these cultural resources were created.

## 4 Literature Review

The transmission of dance, which has traditionally relied on the human body and memory, has undergone a significant shift since the 19th century. The advent of digital technology in the 20th century has enabled the creation of photographic and video recordings, which have become increasingly sophisticated over time. In the 21st century, the advancement of technology has facilitated the production of records that contain more information than ever before. This section provides an overview of Nihon-buyō research that has used technology to contribute to the solution and development of the problems faced by Nihon-buyō.

### 4.1 Prior Research Aimed at Solving the Problem of Nihon-buyō through Technical Intervention.

To understand the flow and types of dance research, four classifications are useful. At a symposium held by the Japanese Society for Dance Research, Bin Umino classified previous studies using computers in dance research into four areas. These areas are (1) recording and visualization, (2) comparison and analysis, (3) learning and education, and (4) choreography and creation research, according to the purpose of existing research on dance works and dance movements. However, in many cases, these areas mutually influence each other, and research is often conducted across multiple areas. This section will review research that is considered to be major in these four areas of Nihon-buyō research in order to clarify what issues and contributions are being sought.

## Research on Recording and Visualization of Dance Works and Dance Movements

First, an indispensable part of the field of Nihon-buyō documentation is the video documentation provided by the Dentō Geinō Jōhō kan (the Traditional Performing Arts Information Centre) and the Bunka Dejitaru Raiburari (the Bunka Digital Library). As explained in Chapter 3, the Traditional Performing Arts Information Centre has been filming and preserving visual records with the intention of utilizing them for future generations, and thus houses a variety of documents, photographs, and videos of the traditional performing arts. As for records made by university institutions, the Art Research Center, Ritsumeikan University is engaged in a comprehensive range of activities from recording, preservation, and dissemination to research. In the research of recording and visualization, Shōhei Nobuhara (2013), in his study “3 Jigen Bideo ni yoru Jintai 3 Jigen Keisoku to sono Oyō” (3D measurement of the human body using 3D video and its application), succeeded in generating an all-around self-viewing 3D image of two *Maiko*'s dances, including their costumes, by using multiple viewpoint video input, and its application was used by All Nippon Airways Co., Ltd (ANA) in their 2017 campaign for inbound tourism, “IS JAPAN COOL? DOU.” As for research that uses monocular images as input, Kajiwara et al. (2018) have developed “Wasō Jinbutsu no Tan Shiten Suitei no tame no Shahei Bui 3 Jigen Ichi Suitei hō” (3D Position Estimation of Shielded Area for Monocular Pose Estimation of a Person in Dressed in Japanese clothes).

Kajiwara also points out, like this study, that it is difficult to obtain learning data due to the difficulty in predicting the position of the joints as the type of clothing worn, the kimono-like garb which covers the body with cloth, is not a narrow-fitting type like Western clothing that sticks to the body. Kajiwara proposed a method of estimating the obscured joints inversely from the kinematics obtained from the corresponding joints between the motion traces

showing equivalent features and the measurable exposed joints. He demonstrated the effectiveness for creating learning data by using two types of motion capture data: with and without traditional Japanese clothing. However, as pointed out by Hachimura (2003), motion capture alone is insufficient for recording traditional performing arts such as Nihon-buyō, where the state of the Kimono is important in addition to body movements.

Nevertheless, it is difficult to obtain motion data of a person wearing a Kimono through pose estimation. Murakami et al. (2018) conducted a study to investigate the usefulness of learning similar postures in videos with difficult annotation of choreography called *Tate* in period dramas, but were hampered by the problem of learning data for machine learning. Due to the fact that characters in period dramas wear Kimonos, which greatly obstruct the body, it is difficult to identify body parts in images, making manual annotation of posture in images difficult. As a result, sufficient learning data could not be obtained. However, the results of that study indicate that training data can be generated from the relative positions of key points, although a different approach is required to achieve pose estimation that is specialized to specific persons/movements, a different approach is required. This is because the construction of the pose estimation model uses images of a motion capture suit, and the relative position of the modeled key points could not be utilized for pose estimation in images of people wearing Kimonos.

This study belongs to the field of recording and visualization research and aims to support the solution of the costume problem, which was identified as a challenge in the previous study by Murakami et al. (2018).

Research on Comparison and Analysis of Dance Works and Dance Movements

Research on the comparison and analysis of Nihon-buyō works or movements, which seems to be the second most studied of the four research categories, tends to be conducted for the purpose of objectively and quantitatively analyzing and evaluating Nihon-buyō movements, often using motion capture. In the research by Kuromiya et al. (2003), the analysis of movements was conducted using a method that involves attaching three markers to the body to introduce a unique coordinate axis and calculate the position information of each part of the body. This method defined angle representation required for movement analysis by marker location, angle, and normal. Yoshimura et al. (2005) built upon this and analyzed *Okuri*, one of the basic movements of Nihon-buyō, using this method to examine feminine expressions, explanatory movements and individuality of movements, and succeeded in demonstrating high discrimination rates in the movement identification experiment and the dancer identification experiment.

As for sensitivity information processing research, Sakata et al. (2004) conducted a principal component analysis of information on velocity and acceleration measured by motion capture and the results of sensitivity evaluation experiments for seven types of sensitivity information in “An Attempt to Process KANSEI Information Found in Physical Movements in Japanese Traditional Dance-Measurements and Analysis Using Motion Capture-,” and the study by Watanuma et al. (2007) mentioned earlier in the introduction belongs to this line<sup>18</sup>.

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<sup>18</sup> The reason why these studies were concentrated in the 2000s can be attributed to the fact that many of them belong to the 21st Century COE Program “Kyoto Art Entertainment Innovation Research” of the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

The most notable study of comparative analysis of dance movements is “Characteristics of each school of Nihon Buyo” (2008) conducted by Mito et al. In this study, Mito et al. conducted measurements and impression evaluations of five Nihon-buyō schools (Fujima, Nishikawa, Hanayagi, Wakayagi, and Bando) with the cooperation of five people each in their 40s, 30s, and 20s, and found that there were relationships between body position coordinates and impression evaluation, and that the characteristics of each school were represented in body shape, direction of movement, and strength of movement. These studies can be said to have solved the problem of descriptiveness of dance pointed out by Watanabe (1991) to a certain extent by analyzing the movement of dance.

#### Research on Learning and Teaching Dance Works and Movements

It can be said that the area of research most desired for practical application by dance instructors or educators is that related to dance education. In their exploratory study of motion analysis aimed at passing on the techniques of Nihon-buyō, Takeda et al. (2009) pointed out the role evoked by the transmission of traditional performing arts using motion capture in supporting the tacit understanding that is gradually enjoyed in the relationship between master and student in the process of Nihon-buyō practice. In “Motion Analysis System for Instruction of Nihon Buyo using Motion Capture” by Shinoda et al. (2011), an educational motion analysis system was constructed with the most important movement in Nihon-buyō, “*Koshi wo Ireru*” (Stabilizing your lower back), as the target. Although, this movement is one of the basic postures, it is the most important and time consuming to acquire. As the latest research conducted with the aim of contributing to the education and transmission of Nihon-buyō, there is “Nihon Buyō ni okeru Taikan bu no Gihō Bunseki oyobi Kiso Renshu hō no Teian” (A biomechanical study of the trunk in Japanese Traditional

Dance using Motion Capture System) by Utsugi (2019). It was conducted to visualize the transmission of the techniques related to the trunk of the body, which is considered difficult in the acquisition of Nihon-buyō, through the use of information technology, and to promote the learning of dance techniques.

### Research on Choreography and Creation of Dance Works and Movements

Finally, I would like to discuss research on choreography and creation, but as I could not find any research on creation for Nihon-buyō at present, I would like to mention research on other genres of dance. Soga (2004) developed a creative support system based on a text-based coding method using ballet terminology. However, it was evaluated that only 4% of the choreographies were usable for beginner ballet lessons, which was the original purpose of the system, because the combinations were too complex for beginners, and the lack of educational intention in the choreography created by the automatic choreography function resulted in no learning effect being detected. As for research on contemporary dance choreography, Uno et al. (2015) developed a body part movement synthesis system (BMSS) for contemporary dance choreography. In an evaluation of the usefulness of the system by students in Japan, the U.S., and the U.K., 85% of the subjects indicated that the system was useful in supporting their creative work, while the system was not assessed as useful in improving their skills.

While the choreography system has room for improvement in terms of education and technical improvement, Soga et al. (2020) have shown that it can provide an effective means of creative support in their experiment to improve the creation of contemporary dance choreographies.

The latest research in using AI to automatically generate choreography to music is “AI Choreographer: Music Conditioned 3D Dance Generation with AIST++” by Li et al. (2021), and further developments are expected in the future.

## 4.2 Mainstream Methods of Dance Research

### Motion Capture

Motion capture is an effective method for acquiring data on the body movements of people and animals. Research on recording and visualization of dance works and dance movements has been conducted since around the 1990s, and the main method commonly used has been motion capture. In most motion capture, the subject is dressed in a motion capture suit with markers attached, and multiple optical motion capture (MotionAnalysis, MAC3DSYSTEM) systems are used to measure posture by surrounding the performer and capturing images from multiple viewpoints. Since motion capture can calculate 3D coordinate information and measure various movements, it is possible to obtain information on blind spots and depth that cannot be obtained from video recording. For this reason, motion capture has been used to project the movements of actors onto character models in movies and computer graphics games<sup>19</sup>.

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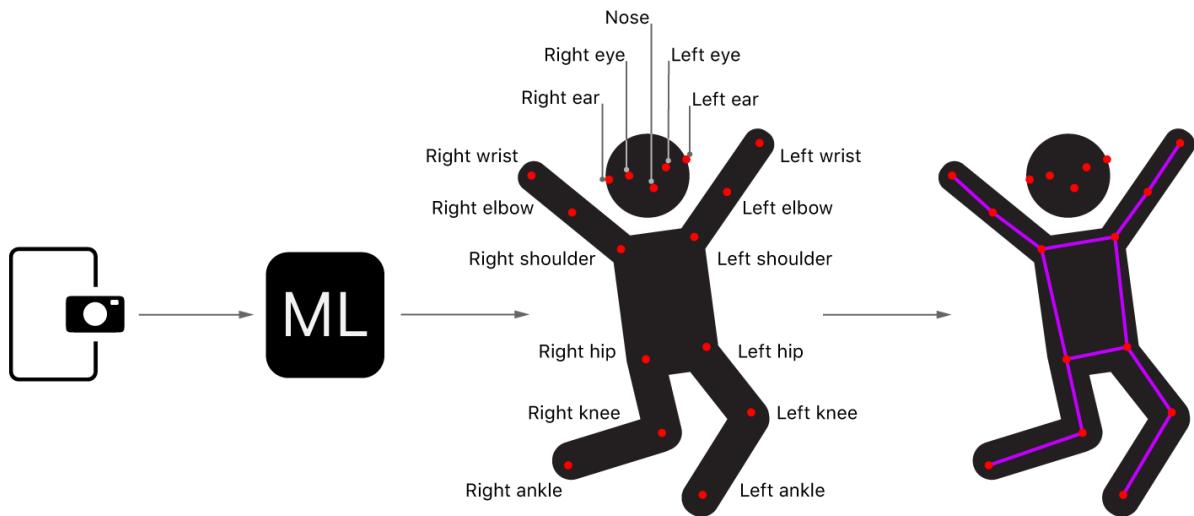
<sup>19</sup> Specific examples of these are “Avatar: The Way of Water” (2022) and “Beyond: Two Souls” (2013).

## Volumetric Capture

On the other hand, recording using volumetric capture has also become popular in recent years. Volumetric capture is a method of capturing 3D data by taking point cloud scans of an object from all directions using a camera equipped with depth sensors. Unlike motion capture, volumetric capture can record a 3D image that contains information not only about motion, but also about the shape and surface patterns of the object. However, one disadvantage of volumetric capture is that it does not have information about the body's coordinate information, or bones, which means it cannot capture motion. In other words, motion capture can make other models perform the same motion by capturing the acquired motion in the human body model, but it cannot obtain data other than motion. Volumetric capture, which has no bone and motion data, can capture 3D data including clothing, makeup and tools, but it cannot capture motion data and requires large facilities for capture.

## Pose Estimation

Since pose estimation can also use previously recorded video as input, it is the method with the greatest potential for future development. Pose estimation is an image recognition technology that divides the coordinates of the human body into around 17 key points, and uses only the input from the image to estimate the pose of the subject and acquire their motion, as shown in Figure 4 .1.



**Figure 4 .1 Flow of attitude estimation and coordinate information**

Source: *Detecting Human Body Poses in an Image*, Apple Developer, accessed July 22, 2022, [https://developer.apple.com/documentation/coreml/model\\_integration\\_samples/detecting\\_human\\_body\\_poses\\_i n\\_an\\_image](https://developer.apple.com/documentation/coreml/model_integration_samples/detecting_human_body_poses_in_an_image).

There are two types of pose estimation: those that output only two-dimensional information and those that output three-dimensional information. Three-dimensional pose estimation requires depth information to be obtained from the two-dimensional video, which makes it more challenging to accurately output position information. Because it allows detailed capture of human movement in the image, research on pose estimation using deep learning is conducted in a wide range of fields. Datasets of learned pose estimation models are publicly available as open source.

### Problems with Prior Methods

Although the price of motion capture has stabilized, it is still a problem that cannot be overlooked, as it often requires expensive equipment, space, time, and money. Additionally, a significant problem in terms of preserving dance is that it may not be possible to wear the

original performance costume because sensors have to be attached to the body or a motion capture suit must be worn. Furthermore, it is considered that calibration, which involves adjusting the correct positions of both the camera and the sensors, and the data processing after shooting, can be obstacles in digital resourcing by Nihon-buyō practitioners. While motion capture can accurately capture the movement of the dancer, it may not be the optimal method for digitizing dance with the dancer as the main subject.

On the other hand, in pose estimation, the dancer does not need to wear any sensors, but the hip joint, which is the main positional information, is hidden from long skirts, Kimonos, and other items that hide the waist area, resulting in a fatal loss of motion accuracy. Since a large amount of data and labeling are required to create a dataset, the generation of appropriate training data and transfer learning of the dataset are necessary for pose estimation of images of dancers wearing Kimono.

To solve these problems, this study reconstructs Nihon-buyō in three dimensions by creating 3D computer graphics of the costumes corresponding to the actual Kimono and synthesizing the motion of the dancer and the Kimono.

## 5 Methods and Materials

Among the recorded materials that have been accumulated so far, records that contain three-dimensional information using computer graphics and motion capture may be effective as one of the means of passing the baton of Nihon-buyō to the next generation, since they can retain a greater amount of information than the cultural resources that have been used so far. In the study of other dances, there has been a lot of research using motion capture and even pose estimation of dances using data sets. However, as mentioned earlier, it is difficult to adapt the pose estimation data sets used in dance research to Nihon-buyō, making it difficult to advance research and practice. This is because the Kimono is worn as a single piece of cloth that wraps around the body, which structurally hides the lines of the body, and the wide sleeves hide the arm movements as well as the movements of the lower body near the waist, which are important for pose estimation. Therefore, this study focuses on the Kimono used as a costume as a factor hindering the digital archiving of Nihon-buyō.

### 5.1 Methodology Employed

In this study, I reconstructed Nihon-buyō in three dimensions by applying cloth-simulation and synthesizing the Kimono and motion separately, with the aim of obtaining the motion from the past video or the video to be taken in the future. In the digital archive of Nihon-buyō, Ryō Kajiwara's (2018) "Wasō Jinbutsu no Tan Shiten Suitei no tame no Shahei Bui 3 Jigen Ichi Suitei hō" is a previous study that considered the Kimono as a problem. Kajiwara pointed out that it is necessary to create training data by motion capture and to verify whether 3D pose estimation of a person in Kimono by machine learning is possible as a further development. We position this research as a foundation for creating training data for machine

learning by enabling 3D pose estimation of a person dressed in Kimono, which was identified as a problem by Kajiwara (2018) and Murakami (2018).

## 5.2 Applications Used

This study aims to propose a method that can be easily accessed by Nihon-buyō practitioners to get started. This is because we believe that it is important for both researchers and practitioners, as well as for future audiences, that digital archives become a more accessible method of transmission and dissemination for Nihon-buyō practitioners, since they can contribute to both the act of preserving the present for the future and the act of inheriting more from the past.

In this study, we utilized Blender<sup>20</sup> for the creation of the model and modification of the motion, as well as the setup of the environment. Using plask<sup>21</sup>, we extracted motion data from the dance of a Nihon-buyō masters, and incorporated the motion data into the Kimono created in Marvelous Designer<sup>22</sup>, applying cloth-simulation. As a result, we were able to recreate the costume and model in a manner similar to actual Nihon-buyō. The software I used was selected based on the digital cultural resourcing by Nihon-buyō practitioners and

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<sup>20</sup> Blender.org, “Blender - Home of the Blender project - Free and Open 3D Creation Software,” n.d., accessed December 7, 2022, <https://www.blender.org/>.

<sup>21</sup> Plask, “Plask - Visual Development for Artists and Designers.” n.d., accessed December 7, 2022, <https://plask.ai/>.

<sup>22</sup> Marvelous Designer, “Marvelous Designer - 3D Clothing Design Software,” n.d., accessed December 7, 2022 <https://www.marvelousdesigner.com/>.

related individuals. I chose free open-source software or software with free features that allow for the reproduction of Nihon-buyō. Blender is an integrated application for creating 3DCG animation, and plask is a browser-based editing tool that utilizes AI to extract movement from video and convert it into motion data. For simulating a Kimono, a high level of cloth-simulation was necessary, and so we chose Marvelous Designer, which is capable of creating costumes and cloth-simulation tools, and compatible with other software.

### 5.3 Data Created

The steps in the three-dimensionalization of Nihon-buyō include: first, creating avatar and costume data; second, capturing video and reading motion; third, animating the avatar and costume data; and fourth, exporting the output data. Each step is described in detail below.

#### CG Avatar

Due to the large number of women in Nihon-buyō and the fact that the Nihon-buyō masters who cooperated in the filming were all women, this study used Blender to create a 160 cm tall female avatar based on a photograph from “Kyara Pōzu Shiryōshū : Onnanoko No Karada hen,” a reference collection of Japanese female drawings materials (see Figure 5 .1). MB-LAB<sup>23</sup>, an open-source character creation add-on, was used to create the model.

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<sup>23</sup> MB-Lab Community, “MB-Lab - Open Source Character Creation,” n.d., , accessed December 7, 2022, <https://mb-lab-community.github.io/MB-Lab.github.io/>.

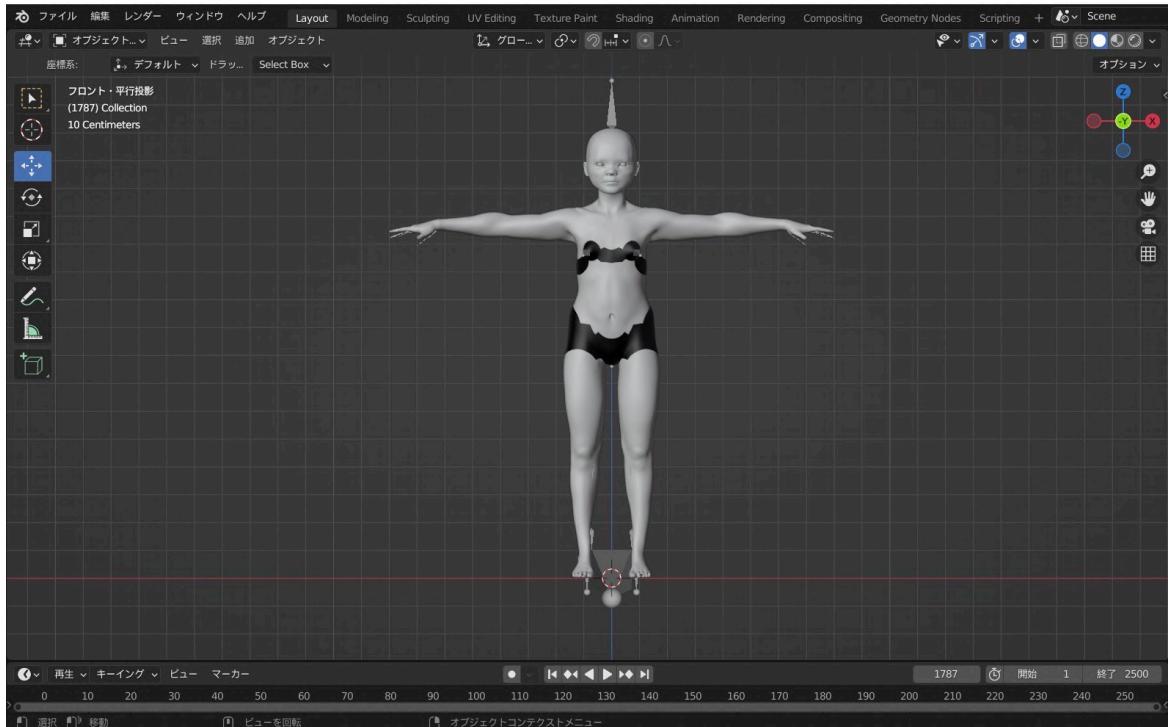
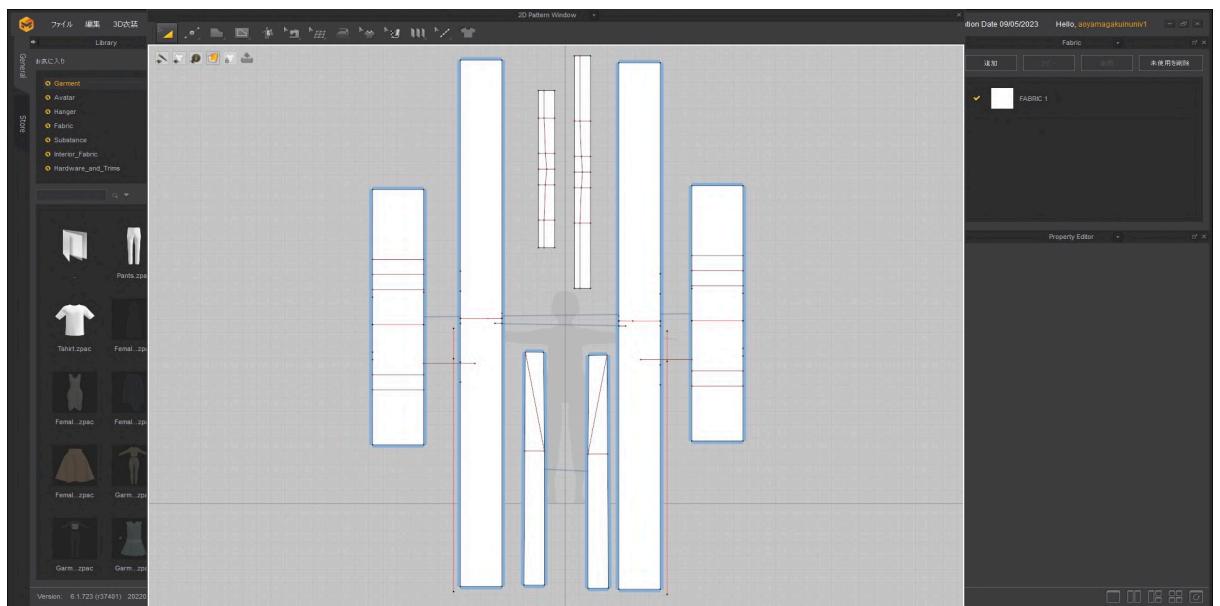


Figure 5 .1 Model created in Blender

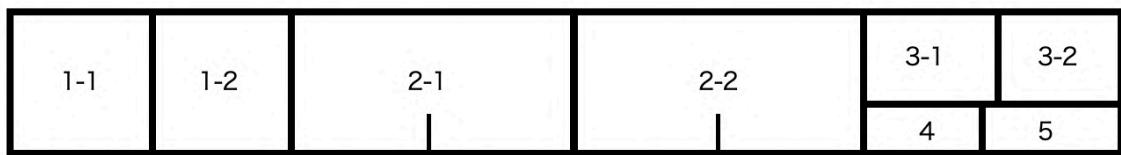
## CG Garments

To create the costume, we will first describe the structure and components of the Kimono.

Kimono is a costume made of linearly cut and sewn fabrics (see Figure 5 .2), and the names of the various parts of the Kimono are shown in Figure 5 .5 and Figure 5 .6. One of the characteristic structures of Kimono is that there are very few cuts in the fabric. This is done to allow for changes in body size and shape as the wearer grows, and to allow the next generation to wear the same Kimono, which can be passed down in different sizes using the same fabric by unraveling the seams. In order to reduce the number of cuts, the Kimono is cut in consideration of the length of the front and back as shown in Figure 5 .2, and is composed of a single piece of fabric cut into eight parts: sleeves, body, and collar (see Figure 5 .3 and Figure 5 .4).

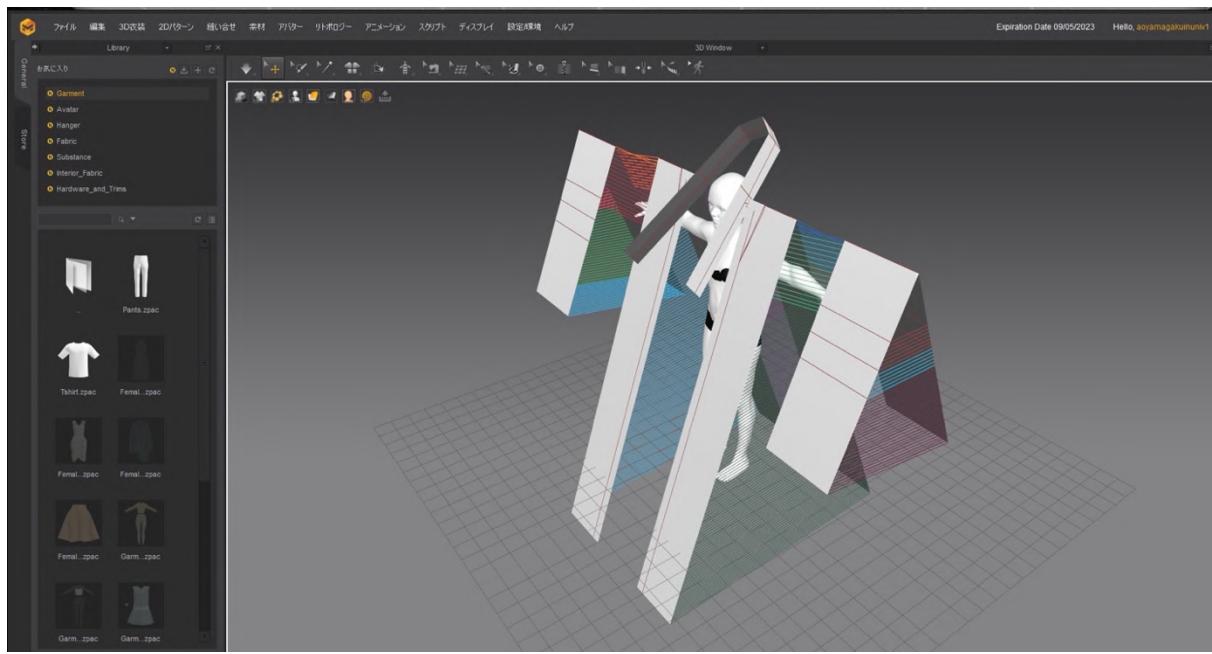


**Figure 5 .2 Development of *Maiko* Costume**



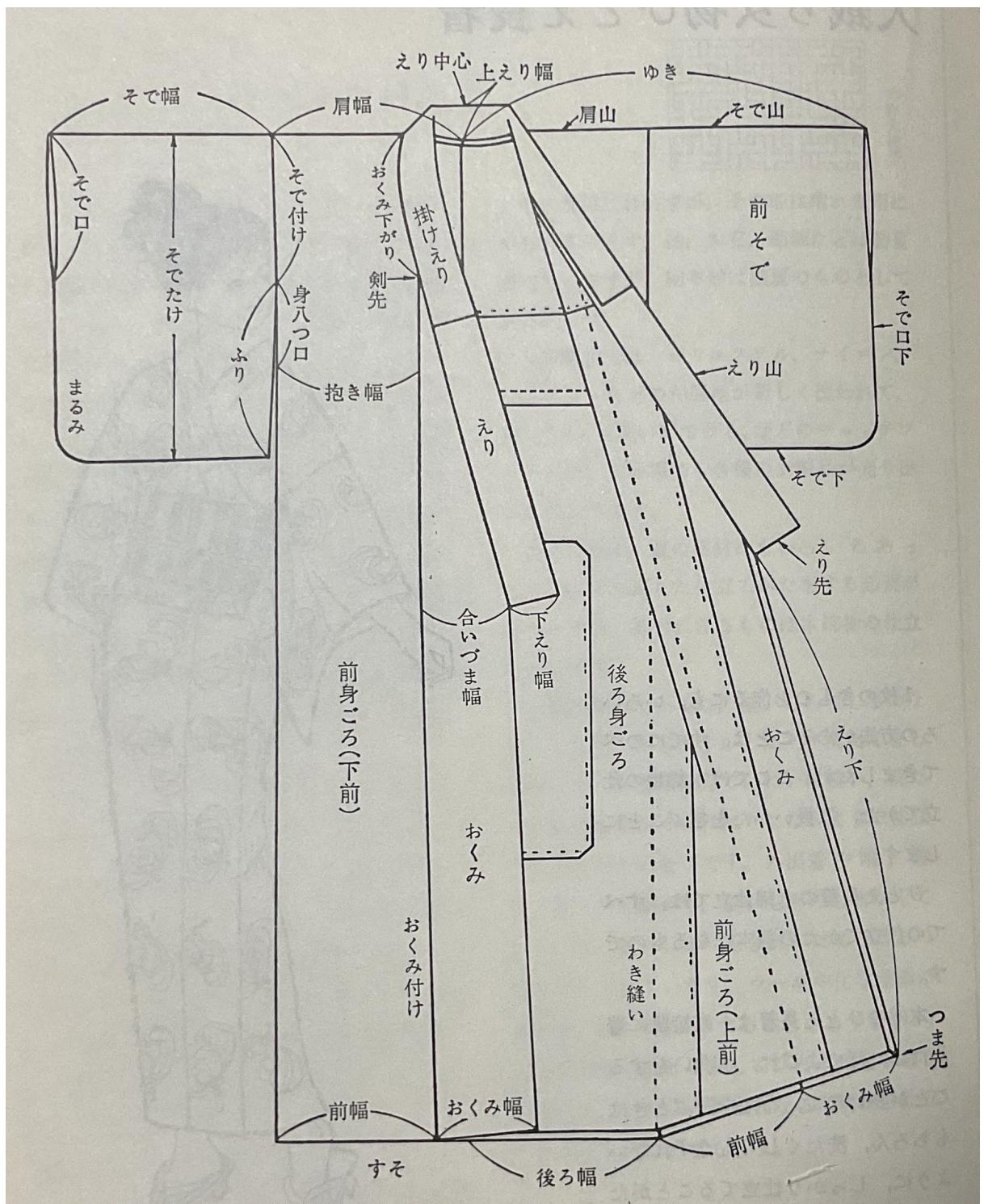
- (1)1-1: sode(right sleeve)
- (2)1-2: sode(left sleeve)
- (3)2-1: migoro(right body)
- (4)2-2: migoro(left body)
- (5)3-1: okumi(panel attached to the right front body)
- (6)3-2: okumi(panel attached to the right front body)
- (7)4: tomo-eri(collar cover)
- (8)5: eri(collar)

**Figure 5 .3 Kimono pattern and each part**



**Figure 5 .4 Fabric Cutting Surfaces and Sewing Together**

Kimono costumes for Nihon-buyō are designed for the stage and differ in dimensions from those used in everyday life. The specific differences are basically the neckline of the back, the length of the area covering the arms from the shoulders to the wrists, and the total length of the Kimono, depending on whether it is temporarily tucked up for use it daily or not. Note that the cutting and sewing mechanisms are the same for women's and men's Kimono, but the dimensions and stitching of the collar and sleeves are different. The most obvious difference is the thickness and position of the obi.



**Figure 5 .5 Names of front parts of Kimono**

Source: Ōtsuka Sueko Kimono Gakuin hen, *Wasai I* (Ōtsuka Gakuin Shuppan bu, 1978), p. 48.

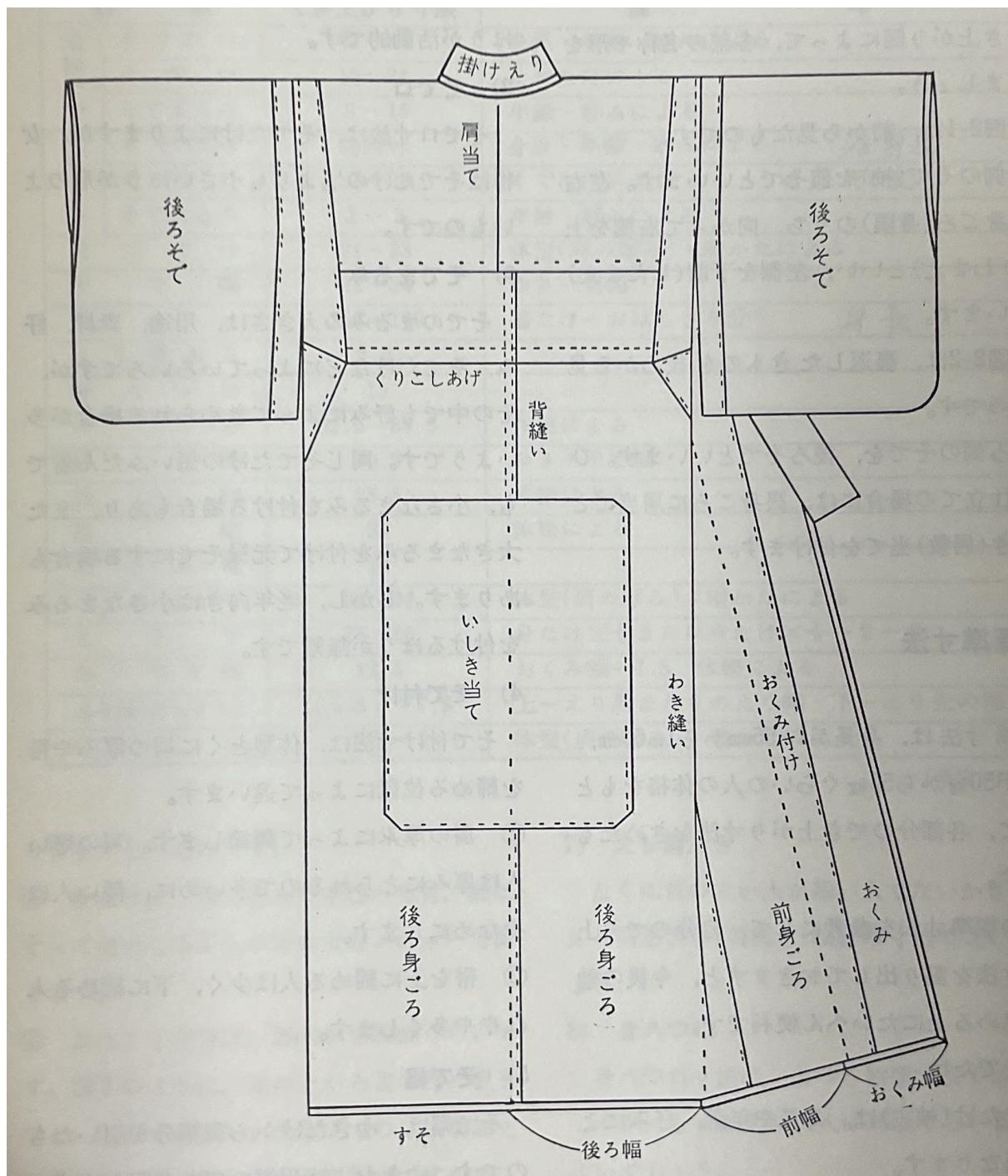


Figure 5 .6 Names of each back part of the Kimono

Source: Ōtsuka Sueko Kimono Gakuin hen, *Wasai I* (Ōtsuka Gakuin Shuppan bu, 1978), p. 49.

As for the categories of costumes, as described in Chapter 1, the types of costumes are divided according to the ranks of costumes, from costumes with gorgeous and detailed decorations and gimmicks like those of formal costumes to simple costumes, and are further subdivided according to the program to be performed. In this case, I assume that the wearer is a 160 cm female avatar, and we created CG Kimono. The type of Kimono to be created is the *Hon ishō* (authentic costume) of a *Maiko* (apprentices of Geisha) in Kyoto<sup>24</sup> (see Figure 5 .7). Since the length and roundness of the sleeves, the opening of the back neckline, and the patterns and gimmicks used in stage costumes vary from performance to performance, the *Maiko*'s Kimono<sup>25</sup>, which is made according to a certain standard, was adopted. In addition, the *Maiko* costume was judged to be more versatile than other costumes because it is one of

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<sup>24</sup> In this study, the costumes were created based on Kyoto *Maiko* costumes. Kyoto *Maiko* costumes have rounded sleeves and shoulder and sleeve tucks, whereas Tokyo *Hantama* (apprentices of Geisha in Tokyo) costumes do not have rounded sleeves and sleeve tucks. In recent years, due to the decline in the number of craftspeople and severing of apprentices of Geisha except Kyoto *Maiko* due to a lack of human resources, there is a trend toward homogeneity with *Karyū kai* of Kyoto, not only in Kimono but also in hair ornaments and other accessories, etc. However, there are differences in costumes among apprentice Geisha in Hokkaido, Kanazawa, Kanagawa, Osaka, Kyoto, Kyushu, and other cities.

<sup>25</sup> Kimono of *Maiko* are made and owned by the owner of *Okiya*, a kind of production company to which *Maiko* and *Geiko* (the name of Geisha in Kyoto) belong, who commissions Kimono merchants to make couture. A Kimono is assigned to each *Maiko* once a month by the owner of *Okiya*, who is called *Okā-san*, the mother of the *Maiko* in *Karyū kai*.

the main costumes for women, the Kimono, which is created with the expectation of continuous use by several persons.



**Figure 5 .7 Overall view of a *Maiko*'s costume**

Source: Tetsuo Ishihara, *The World of Traditional Japanese Hairstyles/ Hairstyles of The Maiko* (Museum of Traditional Japanese Hairstyles, 2004), p. 78.

One clear difference between a *Maiko*'s Kimono and a costume for the stage is the tucks, called *Kata age* (shoulder tuck) and *Sode age* (sleeve tuck) (see Figure 5 .8, which looks like lines around the shoulders and at the top of the sleeves) are done. This is a characteristic of *Maiko*, and since children around 10 years old originally worked as *Maiko*, the purpose is to appeal to their childishness and cuteness compared to *Geiko*, who are full-fledged Geishas. Today, according to the Labor Standards Act, girls between the ages of around 15 and 20 work as *Maiko*, and this kind of workmanship is no longer suitable for a teenage girl of that age, but since it is an essential part of a *Maiko*'s costume, I reproduced this CG garment in a realistic manner, including this work.



**Figure 5 .8 Costume of a *Maiko* with shoulder and sleeve upholstery**

Source: Tetsuo Ishihara, *The World of Traditional Japanese Hairstyles/ Hairstyles of The Maiko* (Museum of Traditional Japanese Hairstyles, 2004), p. 168.

I will attempt to make Kimono easier to understand by dividing the composition of a normal *Maiko*'s kimono into the main elements made from fabric by Japanese dressmaking and the accompanying elements. The main elements are the *Hada juban* (the under Kimono closest to the skin), separable *Naga juban* (the under Kimono on *Hada juban*), *Furisode* (one of the Kimono variety of unmarried women), *Darari obi* (around 7 m long dangling *Obi* belt), and the accessory parts are the *Tsuke eri/Han eri* (attachable decorative collar), *Obi age* (fashionable tying accessory used to hide and cover other sections), *Hi shigoki* (red silk sash), *Koshi makura* (big *Obi* cushion), *Obi makura* (small *Obi* cushion), *Pochiri/Obidome* (decorative *Obi* ornament used only on non-formal occasions), *Obi himo* (fashionable fasterning rope), and *Tabi* (slip-toe Japanese socks for Kimono) (see Figure 5 .9). Other parts not visible on the surface include an *Obi ita* (setting piece), *Koshi himo* (waist rope), and a *Datejime* (thin but wrapping silk sash), which are omitted because they are not necessary in the CG. In reality, however, Kimono is actually worn as shown in Figure 5 .10, with the cloth held down by a string-like tool.



**Figure 5.9 List of *Maiko* in underwear and costumes worn**

Source: Hiroshi Mizobuchi, *Gion Ichisuzu* (Shogakukan, 2000), p.15.



**Figure 5 .10 Actual Maiko costumes and dressing**

Source: Hiroshi Mizobuchi, *Miyagawacho In Kyoto - the Flowery World Where Maiko & Gaiko Still Live* (Mitsumura Suiko Shoin Publishing Co., Ltd, 2013), p. 85.

The main elements were adjusted according to the dimensions of the professional Japanese dressmaking manual, “*Senmon Wasai Gino Kyoka Sho*” (Okitsu 1979) and created on Marvelous Designer. The accessory parts (*Tsuke eri/ Han eri, Obi age, Hi shigoki, Koshi makura, Obi makura, Pocchiri/ Obidome, Obi himo, and Tabi*) were omitted or adjusted as necessary so as not to affect the cross simulation to the extent that there are no problems with appearance.

### Phase 1

First, a cross simulation was applied to the model by creating the same the *Hada juban*, Separable *Naga juban*, *Tsuke eri/ Han eri, Furisode*, and *Darari obi* as in real life, and the result is shown in Figure 5 .11. At first glance, the model appears to be fine. However, when trying to move the model, the motion could not be adjusted because the three layers of fabric (*Hada juban*, separable *Naga juban*, and *Furisode*) covering the body caused a wide range of

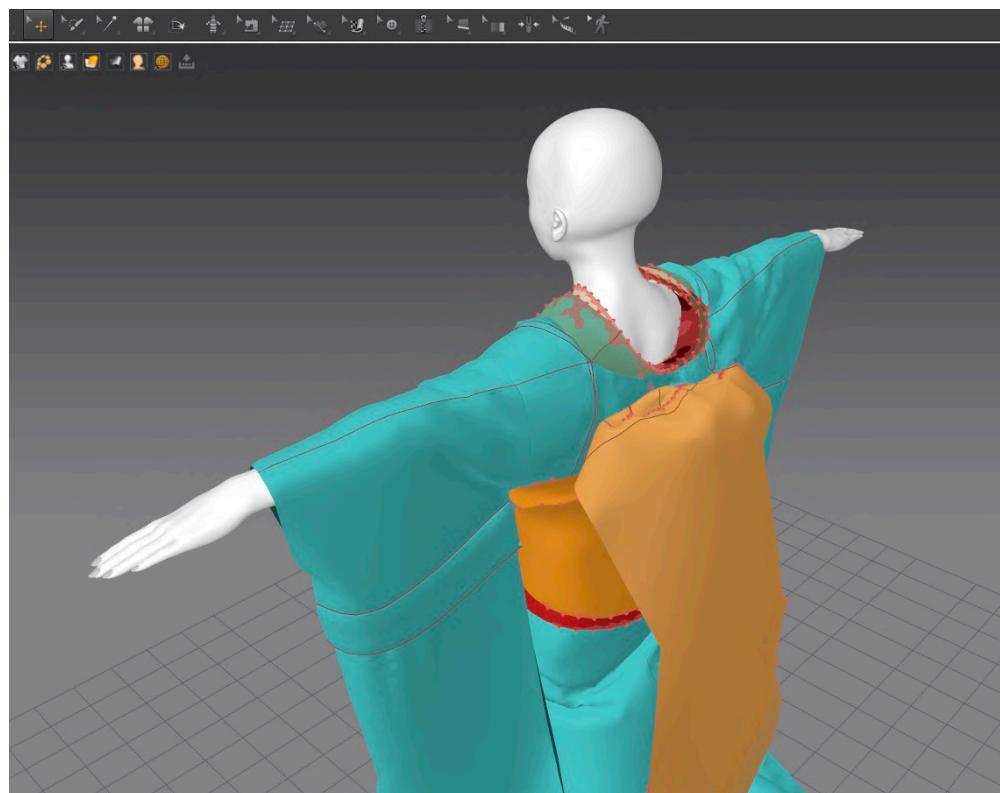
collisions penetrating the costume and the costume itself, which would not physically occur in reality. The problem occurred especially in the sleeves and hems, where the motion largely moves (see Figure 5 .12). In addition, the fabric alone could not maintain the back neckline shape, where the collar create space around the nape, which is characteristic of Nihon-buyō stage costumes (see Figure 5 .13).



**Figure 5 .11 Kimono created in the most realistic manner**



**Figure 5 .12 View of lintel penetrating the Kimono and failing sleeves and sides**



**Figure 5 .13 Collar that could not retain its shape with fabric alone.**

## Phase 2

Next, I attempted to solve the problem by omitting the *Hada juban*, which would not be visually affected by its omission, and cutting off a portion of the Separable *Naga juban* and sewing it to the *Furisode* to avoid overlapping fabric (see Figure 5 .14 and. In addition, the collar was changed from fabric to an object and integrated with the avatar. This reduced collision and solved the problem of keeping the collar in shape, but the instability of the sleeves when the motion was adjusted was not tolerable for viewing. In Figure 5 .15, the *Naga juban* is shown on the left side, but this is only hidden for convenience to show the inner layer of the Kimono, and does not differ from Figure 5 .11 in appearance.



**Figure 5 .14 Omitted underwear, *Hada juban***



**Figure 5 .15 Kimono with lintel modified to the extent that it does not interfere with appearance.**

### Phase 3

Finally, changes were made to eliminate instability by placing the greatest emphasis on stability during motion adaptation, even though this would affect the appearance of the animation. The *Naga juban* was removed and a texture of the *Naga juban* was applied to the lining of the *Furisode* to reduce the sense of discomfort when viewing the animation. Although this is an abnormal form of the normal structure of the Kimono, it was possible to reproduce the costume movements necessary for a dance of viewable quality (see Figure 5 .16 and Figure 5 .17).



**Figure 5 .16 Front of the created Kimono**



**Figure 5 .17 Back of the created Kimono**

Video and Motion Data of the Dances Captured

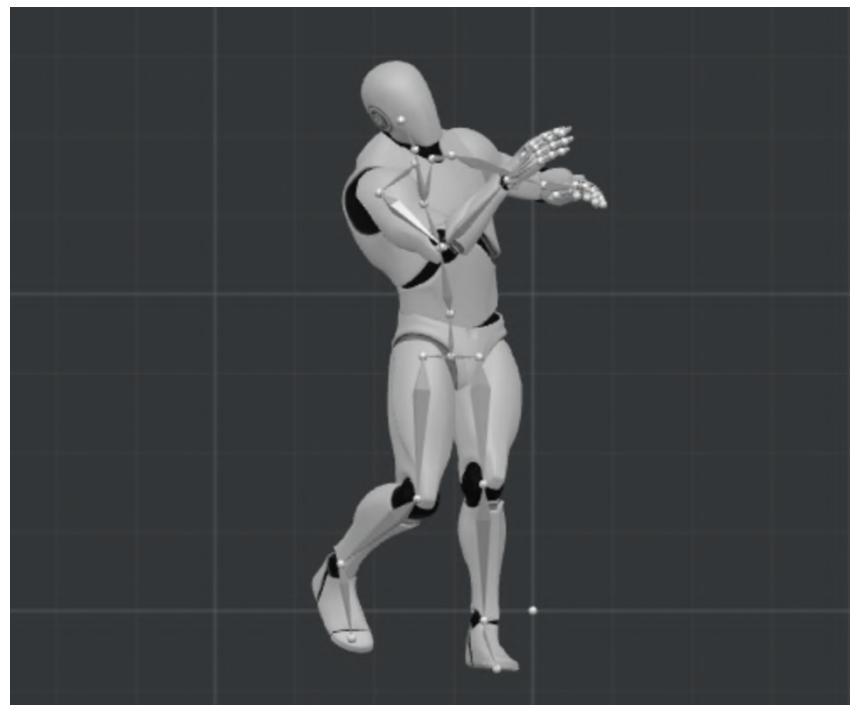
Given the fact that many dance motions suitable for Nihon-buyō have been posted on the internet, it would seem that the environment is ready to move forward with the study of creating a dataset for Nihon-buyō if provided that the two challenges of obtaining permission from the video uploaders and preventing hindrance of pose estimation by the Kimono can be met. However, when I interviewed practitioners of Nihon-buyō in the process of creating

motion for Nihon-buyō, they pointed out that although there are videos of Nihon-buyō dances posted on YouTube and other video sites, and the quality of the technique varies from good to poor, it must be difficult for people who are unfamiliar with Nihon-buyō to judge the quality of the dance. For this reason, this study requested the cooperation of three instructors of the Umemoto, Mizuki, and Bando school, and asked them to dance four performances of “Kyo no Shiki,” “Itako Dejima,” “Matsu no Midori,” and “Hōrai” in two patterns, one wearing Western clothes and the other wearing a Kimono. The classification of each dance is shown in Table 5.1. All five videos were shot by a fixed camera so that the dancer's entire body was always visible from head to toe, and plask was used to create motion data by pose estimation (see Figure 5.18).

**Table 5.1 Classification of Nihon-buyō photographed**

	<b>Shihan of Umemoto</b>	<b>Shihan of Mizuki</b>	<b>Shihan of Bando</b>
<b>Kyo no Shiki</b>	Women dance of Kamikata -mai	Women dance of Kabuki-buyō	
<b>Itako Dejima</b>		Women dance of Kabuki-buyō	
<b>Matsu no Midori</b>			Men dance of Kabuki-buyō
<b>Hōrai</b>			Women dance of Kabuki-buyō

(Created by the author)



**Figure 5 .18 Motion estimated from video using plask**

#### Data Export

The above data were created in Blender, plask, and Marvelous Designer, respectively, and were exported to the game engine Unity<sup>26</sup> for rendering in order to use them as three-dimensional content. The results of the created Nihon-buyō cultural resources have been uploaded on GitHub at the following address:

[https://github.com/tammyA5/dissertation202303.](https://github.com/tammyA5/dissertation202303)

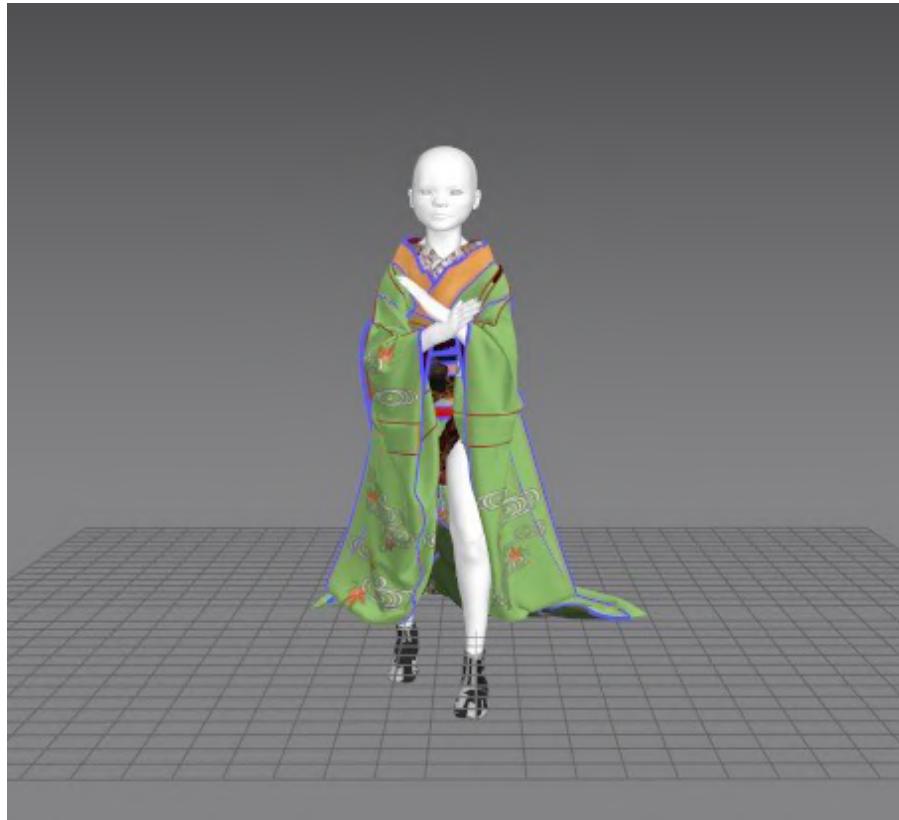


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<sup>26</sup> Unity Technologies. “Unity - Real-Time Development Platform,” <https://unity.com>, accessed December 7, 2023.

## 6 Results

### 6.1 Three-dimensional Reconstructions Output from Five Nihon-buyō Videos



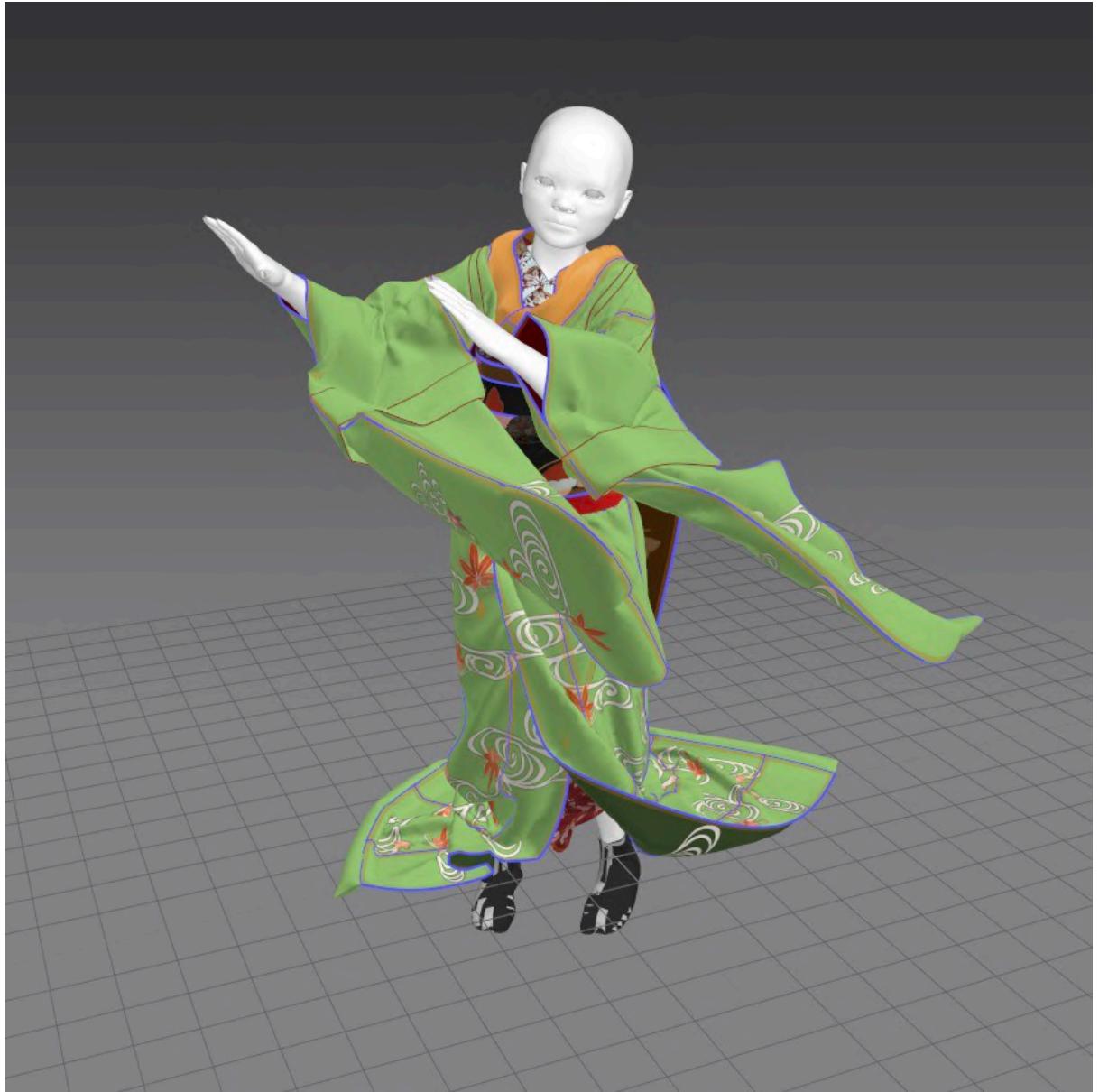
**Figure 6 .1 Typical Simulation Failures**

It was found that without any modifications, the motion simulated would cause phenomena that would be gravitationally impossible in reality to occur, as shown in Figure 6 .1. The phenomenon of the Kimono being rolled up by the foot motion could be prevented by adjusting the pressure parameters of the Kimono fabric, but this also revealed another problem. Namely, the feet pushed through the floor and an error occurred with the Kimono, caused by an inability to reproduce the ground contact between the feet and the floor, which tends to occur in motion data obtained by pose estimation. Although the avatar itself

penetrated the floor, the costume data did not fall below the floor, so only the Kimono was unnaturally removed and left on the floor (see Figure 6 .2). Finally, by manually correcting only the position of the feet and the obvious anomalies that could not occur in reality, such as interpenetration between the avatar's body parts, a three-dimensional digital cultural resource with appreciable quality was created (see Figure 6 .3 and Figure 6 .4).



**Figure 6 .2 Errors at the beginning and end of bowing**



**Figure 6 .3 Animation on Marvelous Designer**



**Figure 6 .4 Rendering in Unity**

## 6.2 Problem

In this study, we did not reproduce the fan, which is an essential prop in Nihon-buyō (Figure 6 .5 and Figure 6 .6 ). The movements of props that are different from human motions require a separate motion setting, and currently it is anticipated that the setting of such

movements will be manual. In order to promote the creation of digital cultural resources by practitioners, we wanted to present a method that could be done easily, and therefore, in this study, the creation of digital cultural resources was limited to three-dimensional reconstruction concentrating on the dancer's movements and costume movements.



**Figure 6 .5 The most used prop in Nihon-buyō: the dancing fan.**

Source: Hiroshi Mizobuchi, *Gion Ichisuzu* (Shogakukan, 2000), p.82.



**Figure 6 .6 Example of dancing with props other than a fan Yachiyo Inoue V, Inoue School of Kyoto Dance**

Source: Hiroshi Mizobuchi, *The Kagai in Kyoto - Legendary Beauty of Geiko and Maiko* (Mitsumura Suiko Shoin Publishing Co., Ltd, 2015), p. 125.

In addition, as presented in previous studies, facial depiction is important in Nihon-buyō in terms of makeup, eye movement, etc. However, in this study, only 2D video information was used as input, and detailed face-related information was not reflected in the human body model. Unlike motion capture, which uses specialized equipment and sensors, methods based on pose estimation have the problem of not capturing detailed information such as fingers and

eye movement. In particular, as the saying goes, “God is in the details,” and in order to continue to pass on real-life performing arts even through digitization, it is essential to solve these problems, and we intend to address them as issues in future research.

### 6.3 Limitations and Future Prospects

This study focused on the costumes of Nihon-buyō, with the aim of helping to create a three-dimensional digital archive based on pose estimation and to make them a digital cultural resource. However, there was one point that was not mentioned: the change of costumes on the stage. In Nihon-buyō, there is a performance technique called *Miarawashi*, in which costumes are changed on stage. *Miarawashi* is mainly used as a visual change to reveal a character's true identity, which was previously hidden, and is often used when the accompaniment is changed. There are two types of costume changes: *Hikinuki* (pull-out) and *Bukkaeri* (turn inside out and hang down), in which the performer, standing in the center of the stage, changes costumes by removing the topmost Kimono from the performer, who wears layers of costumes with tricks, by a person called *Kōken* who assists the performer discreetly on the stage. Further research on the digitization of Nihon-buyō from the costume is required in order to be able to accommodate staging that makes explicit the change in character and role of the performer dancing through costume changes and the use of props. Since this study converted Nihon-buyō dancers' dances into motion data by pose estimation, it has the limitation of not being able to reflect detailed movements such as fingertips, which is often the case with pose estimation using images as input.

## 7 Discussion

### What Digital Cultural Resourcing Means for Nihon-buyō

We focused on the Kimono as one of the factors preventing Nihon-buyō from riding the wave of digitalization of cultural resources that accompanies technological development, and by reproducing both the Kimono as a costume and the body movements through simulation, we presented two possibilities of cultural resourcing of three-dimensional information for Nihon-buyō: a preservation role and the possibility of transmission and creative development. The project presents two possibilities of cultural resourcing of Nihon-buyō in three-dimensional information: preservation and transmission, and creative development.

As we have seen, there are many recordings of Nihon-buyō left behind by our predecessors. Although many of these recordings are two-dimensional information and of poor quality, they are important because they convey the dance, which is difficult to describe and share, to those of us living today and to future generations to come, through the use of images. However, these recorded materials may become unplayable due to deterioration of the recording media, and the information itself may be lost. Recording information technology and recording media are constantly evolving, and recording methods that were considered optimal at the time may suddenly and dramatically deteriorate 30 years later. Therefore, it will be necessary to protect recorded information by regularly updating to a recording medium that is more stable and can record more information, although financial issues will always be present. In doing so, we should not just transfer the information to another medium, but should try to discover new information by taking advantage of the transfer. If we can learn about movements that have not been revealed by conventional two-

dimensional information through three-dimensionalization, we will be able to learn new techniques of traditional performing arts, including Nihon-buyō, from the performances of our predecessors and make the best use of these techniques. Although three-dimensionalization is only one example of this, we believe that by viewing the recorded materials of Nihon-buyō as a cultural resource and transferring them to a digital context, we can make people more aware of Nihon-buyō and encourage dynamic activities such as utilization and creation. This study focused on the three-dimensional (3D) digital cultural resources of Nihon-buyō, focusing on the costumes, and recorded the movements of the costumes by synthesizing motion and cloth-simulation animations.

Three types of three-dimensional digital cultural resources were created, depending on the extent to which the problem of cloth penetration caused by the presence of human modification and physical operations in the cloth simulation was allowed between the real Kimono and the CG Kimono. Using the type of Kimono with the quality of the most simulation results worthy of viewing, we were able to create a three-dimensional digital cultural resource of five videos filmed with the cooperation of a Nihon-buyō dancer. This study differs from previous studies in that it is novel in that it focuses on both the dancer's movements and the movements of the Kimono.

I believe that three-dimensional digital cultural resources created in this way can contribute to the creative development of Nihon-buyō. As reasons for this, we would like to add a discussion from the perspective of cultural resource studies on the increase in availability through the transfer of context to digital and the departure from the possible state through the assignment of value. In valorization by entities other than the subject of the target culture, the embedding of the object in a different context from the one that the target culture has traditionally used as its everyday context can be seen as a movement of cultural resourcing. However, the transfer of context to the digital world seems to have distinctly different

characteristics compared to other forms of resourcing such as commercial contextualization: the unboundedness of the digital world to physical constraints such as time and place, and the transcendence of the language barrier of dance's non-verbal physical expression. Of course, the music that accompanies the dance has lyrics, and it is certainly preferable if those lyrics are understood. Yet, the expression through the body that is universally conveyed, without physical limitations, allows people all over the world to appreciate and understand it, bringing an improvement in accessibility that cannot be compared to other contextual transitions.

Every object has latent abilities and qualities, but some are in a state of dynamis that have not been demonstrated or valued in the previous context. The shift from two-dimensional to three-dimensional in the transfer to the digital context opens up the possibility of deep recognition of dance by viewing the dances of others or the dancers themselves in three dimensions from all directions from a third-party perspective, as well as the possibility of valuing and giving meaning to dances in applications that are not currently envisioned. This is an act that will boost the value of Nihon-buyō itself as a cultural resource and develop it into an *energeia*.

While it is important to uncover information from past archives, it is also of great value to three-dimensionalize the present-day dances of contemporary Nihon-buyō artists. This is because Nihon-buyō is a living culture that is being created and passed on day by day. Not only the practitioners who teach, but also the practitioners who learn can gain insights from the three-dimensionalization of their own movements, and if these dances can be propagated in the XR culture, such as VR and AR, they will have an impact on more people.

Although there are limitations in that we have not been able to reproduce the props used in Nihon-buyō, and some modification work is needed to compensate for the accuracy of the pose estimation, the experiment aiming to create digital cultural resources in this study is not

intended to create cultural resources of Nihon-buyō only for a limited number of people, but to provide a foundation for cultural resource creation by general practitioners of Nihon-buyō, and to support and promote the activities of practitioners of Nihon-buyō who aim to spread and promote the genre. Future research will require the use of the Kimono data generated by this study to create a three-dimensional Nihon-buyō data set adapted to Nihon-buyō.

Although this study did not reach that point, we believe this research will be a useful resource for Nihon-buyō dancers and researchers.

## 8 Conclusion

### The Necessity of Maintaining and Developing the Diversity of Nihon-buyō

For the transmission and development of Nihon-buyō, I believe that three-dimensional digital cultural resources are required. However, for its implementation and for the maintenance of the current status of Nihon-buyō, government funding and cultural policy, including educational activities, are necessary. Problems such as the definition of traditional Nihon-buyō, the gap between the public perception of the term “Nihon-buyō” and the government's perception, the lack of participation in education, and the declining population are now well beyond the scope of efforts by Nihon-buyō practitioners. In order to protect Nihon-buyō as one of the components of diverse Japanese culture, the government should work from the perspective of public interest to protect not only folk dance, which is registered as an Intangible Cultural Heritage, but also traditional Nihon-buyō as a performing art.

The reason why Nihon-buyō, which began as a separate art form from Kabuki, has been able to survive through ups and downs, due to competition with other forms of entertainment and the influence of major events that shook the country, such as the opening of Japan to the outside world and wars, and has continued to exist today despite its rise and fall, is due to the diverse repertoire of many schools and spin-off works that have survived in response to various crises at different times. The reason why the repertoire of many works, including many schools and spin-offs, has survived in diversity is due to the work of various performers and the flexibility of change in Nihon-buyō.

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