The Responses and Tasks of Dance in the Era of the Fourth Industrial Revolution: Focusing on the Use of Signage

Pil-Kyu Yoon[1]

Kyungwoon University, Republic of Korea, Professor

Jae-eun Kim[2*]

Kyungwoon University, Republic of Korea, Professor

The development of culture and arts-related industries including dance has a range of effects such as economic growth and job creation resulting from the expansion of the industries, the realization of healthy leisure, increased access to culture and arts for the public, welfare promotion, the provision of social and cultural services, and the improved self-sustainability of culture and arts. In terms of public welfare, culture and arts-related industries have the advantage of contributing to the establishment of a both physically and emotionally sound welfare society by providing various goods and services and leading emotional leisure and entertainment-oriented society. Apart from the primary participation where audience is touched by dance performance, it is necessary to provide spectators with the opportunity to become the subject. In this way, even people who are not interested in dance can be attracted to the fun factors during the participation process and become major customers of dance activities. In addition, exporting dance content applied with such IT technologies abroad can produce high added value as well as improve both dance-related industries and the image of South Korea as an IT powerhouse.

Key words: dance, the Fourth Industrial Revolution, Signage

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* Corresponding author.
  Email address: eun3039@hanmail.net

Introduction

In the modern society with advanced science and industries, the Fourth Industrial Revolution was put on the priority agenda at the World Economic Forum (WEF). In South Korea, relevant political, social, and cultural issues have gained attention, and the Fourth Industrial Revolution has become today's social trend, i.e. keyword. The Fourth Industrial Revolution refers to the transformational and innovative industrial changes currently in progress as cutting-edge information technologies such as robots, Artificial Intelligence (AI), Internet of Things (IoT), and big data are integrated into society and the economy. Characterized by hyper connectivity and super intelligence, the Fourth Industrial Revolution is expected to affect a wider range of sectors at a faster rate than the conventional industrial revolution(Kim, Kim, 2012).

The Fourth Industrial Revolution and Development are essential in improving the expandability of dance, where human movement is an important nature. In physical education, there has been demand for various studies on human movement(Kim, Kang, 2005). In sports, technologies based on AI have been introduced and implemented for record measurement and analysis and sports broadcast through media. It is critical to attempt to improve the expandability of dance based on the development of science and technology. Some preceding studies on this include the follows: Shin Jang-mi (2017) analyzed William Forsythe's One Flat Thing, Reproduced, which was implemented from the viewpoint of weak artificial intelligence, according to Laban's theory of movement. Baek Hyun-soon (2016) stated that Korean creative dance based on science and technology is a dance that combines humans and computers, an emotional dance that modernizes the tradition, and a combined dance encompassing all genres and that it will be appreciated via smartphones or computers rather than a physical stage.

In this regard, it is essential to conduct research for the understanding of the technology and social change of the Fourth Industrial Revolution and the convergence of artificial intelligence in the dance field so as to diversify the dance world in accordance with the development of science and technology(Park, Hwang, 2017). Therefore, this study aims to explore the current use of signage, one of diverse technologies that can lead the Fourth Industrial Revolution and investigate the possible measures to diversify and advance the traditional way of appreciating dance.

The Role and Necessity of Mass Media for Dance

What is mass media in modern society?

Mass media is the means to deliver a large amount of information to the general public, which in the past was limited to newspapers, magazines, broadcasts, and movies. Due to the development

of industries and IT technologies, however, the Internet and smartphones are widespread, and receiving information through various applications on smartphones is now included in mass media. Now that smartphones have become the norm in our daily lives, we can receive various media information from all over the world regardless of time and place.

The history and role of mass media in dance

Dance, which is based on human body movements, had spatial limitations in the past because spectators had to visit the venue in person to see the performance. However, the genres of dance have become more diverse and dancers are getting active in those various genres, making more attempts to overcome the temporal and spatial limitations and go outside the theater where they can directly meet their audience(Yoon, Kim, 2019; Lee, Chang, Kim, Lim, 2019). Dancers create their own performance content and share it on media platforms including YouTube so that more people can watch their performance. In the past, dance was recognized as an art genre that only specific groups of people could enjoy, in which not anyone could participate. Nowadays, however, popular dance with uniqueness and universality is becoming widespread, going beyond the limitations of pure art dance. For this reason, anyone can now create a video of their creative moves and share it with the general public(Choi, Shon, 2017).

Dance provides a variety of colorful visual sights based on the physical beauty of humans by overcoming the physical limitations(Jaimie, Lee, 2019). In addition, the non-verbal communication and openness that can be enjoyed by all people around the world regardless of their race or country of origin make it an important material not only for TV but also for the entire spectrum of media. The sometimes static and sometimes active movements of dance give vicarious pleasure about the beauty of body expression to those who watch it through the media.

The Definition and Types of Signage

The definition and effect of signage

Signage is an outdoor advertising using digital information display. The content of the billboard can be controlled through a communication network by its control center. It is commonly seen in public places with heavy foot traffic such as subway stations, bus stops, and elevators in buildings. The technology of signage was developed in a way to show the content in the form of advertisements. These days, on the other hand, it is being developed as advertisements in the form of two-way communication using human motion recognition that identifies human behaviours and Near Field Communication (NFC), which is a short-range wireless connectivity technology(Choi, 2017). For this

reason, signage has gained attention as the fourth media following the Internet, TV, and mobile services. Expectations for the technology and development of signage can be found in the movie Minority Report. The movie shows an outdoor billboard that identifies an individual using their irises and provides personalized advertisements tailored to individual tastes and characteristics. For example, if a man in his 30s passes by, the billboard will display advertisements of beer that he likes or cars that he has shown interest in. For a woman in her 20s, customized advertisements of beauty products that she is interested in will appear. The realization of such technology will help maximize the advertising effect for businesses through customized advertising and benefit consumers by providing only the necessary information out of the flood of advertisements.

The main types of signage

Outdoor digital signage

One of the most common types of digital signage today is outdoor digital signage installed on the exterior wall of a building or on an electronic board. The large waterproof LCD TV broadcasts video advertisements similar to TV commercials or live news. It is usually connected to the PC of the central control center through the Internet, which makes orders to replace advertisements(Moon, Min, 2017). Although it has a primitive form and is far from interactive communication, outdoor digital signage is significant in that there is no need for people to change advertisements like conventional outdoor advertising and it is fun to watch.

Indoor digital signage

It uses touch screen kiosks to actively communicate with users. Indoor digital signage includes the machine installed in front of a restaurant to issue discount coupons for affiliated credit card holders and Digital View devices in subway stations that provide subway information as well as the internet phone call service. Recently, the number of bus stops applying digital signage has increased.

Three-dimensional advertising signage

Recently emerged, three-dimensional advertising signage draws people's attention by playing video on a 3D display or using Augmented Reality (AR). In recent cases, projectors and cameras are installed in specific spaces to detect people's movements and create three-dimensional images. No special device is required for users to experience 3D advertising.

Signage using augmented reality

Signage using AR aims to make the most out of the full-fledged prevalence of smartphones. In 2009, The Lego Group introduced AR to kiosks installed in some stores in the United States, which received rave reviews from consumers. Known as the Lego Digital Box, the kiosk shows what finished Lego kits will look like when customers hold a box up to the display.

Various Roles of Signage in Dance

Provision of performance status and information

The theater is the typical place where signage is used for dance. It is where the presence of signage stands out in the field of dance. In a theater, there are some seats that do not give a full view of the entire stage (blind spots). Additionally, even those with great attention to detail are likely to miss important scenes. Using signage properly can solve such problems and help audience enjoy every detail and moment of the performance. It can also provide extra information including interpretations of the performance flow, making it easier for audience to gain an in-depth appreciation(Choi, Shon, 2017).

Dancer training using AR signage

The psychological state of dancers is very important for the success of performance. When a dancer rehearses in a new venue instead of the room where they used to practice, it is not easy for them to adapt to the unfamiliar environment within just a few hours. It is an effective strategy for a successful dance performance to set a virtual stage using AR and practice with it before rehearsing at the theater so that dancers can experience the actual stage in advance.

Performance transcending the dimensions of time and space through signage

If the flow of a dance performance is interrupted, the dancers or the audience may lose focus. Broadcasting a performance in real time using AR signage at a place that is not the actual theater will let those who could not visit the venue in person feel the dynamic atmosphere as if they are watching it directly at the theater. The timeless and placeless feature is the advantage of using signage in dance.

Marketing effect of signage for dance

At theaters, signage provides information on the progress of the performance and the flow of contents continuously. Although it is not proper to provide sports-related advertisements during dance

performance, signage displaying advertisements and information on the performance before the show starts will help audience better understand the performance as well as produce a marketing effect.

Conclusion and Suggestions

The development of culture and arts-related industries including dance has a range of effects such as economic growth and job creation resulting from the expansion of the industries, the realization of healthy leisure, increased access to culture and arts for the public, welfare promotion, the provision of social and cultural services, and the improved self-sustainability of culture and arts. In terms of public welfare, culture and arts-related industries have the advantage of contributing to the establishment of a both physically and emotionally sound welfare society by providing various goods and services and leading emotional leisure and entertainment-oriented society.

Despite the importance of the fostering and development of the culture and art industry, the sports sector has focused only on the performance-oriented expansion of dance(Brigitte, 2019; Ebe, 2020). It is an unfortunate fact that South Korea has failed to keep up with the changes of the times and to actively introduce IT technologies in contrast to its international status as an IT powerhouse built on the advanced fourth industry. Going forward, it is necessary for dance-related industries to discover industrial models suitable for the 21st century by integrating the four sectors of industry, life, culture, and technology. Reflecting this, new content should be created and developed by transforming from spectatorship-oriented to emotion-oriented performance, and for services to feeling-oriented services, which emphasizes heart to heart communication. In accordance with the changes and demands of the times, the development and application of signage is a very useful factor in the development of new content and the expansion of the dance sector. Since new technologies have deeply settled and frequently used in our daily lives, the dance sector also needs to live up to the expectations of customers who use the industry, unlike the past. In particular, it is urgent to develop content for signage that combines IT technologies on dance-related topics to make the younger generation who are keen computer and smartphone users as potential customers of the dance industry. Apart from the primary participation where audience is touched by dance performance, it is necessary to provide spectators with the opportunity to become the subject. In this way, even people who are not interested in dance can be attracted to the fun factors during the participation process and become major customers of dance activities. In addition, exporting dance content applied with such IT technologies abroad can produce high added value as well as improve both dance-related industries and the image of South Korea as an IT powerhouse.

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