

Eclecticism and Unity in Diversity – Analysing the integration and application of modern technology in theatre arts

Dongyao Li

Tianjin Conservatory of Music, Tianjin, China

Abstract. In today's rapid development of science and technology, almost every aspect of our life has a very close relationship with modern technology, especially in the creation of art is more and more inseparable from the aid of modern technology. As a large branch of artistic creation, stage art design is a comprehensive art, involving scene design, lighting, sound effects, costumes, make-up, props, special effects and many other aspects of its more inclusive. This paper starts from the use of modern science and technology in stage art design, and analyses how stage art design can be unified under the diverse and pluralistic forms of expression.

1. Introduction

Today, the rapid development of modern technology, people's lives can not be separated from the help and support of science and technology, throughout the history of the development of the world stage, In the digital age, theatre arts are also inseparable from the principle that "science and technology are the first productive force".^[1] From the construction of the theatre, stage space layout to the entire performance process, etc. are inseparable from the development of science and technology, in addition to the stage art design is originally a comprehensive art, including scenery, props, lighting, costumes, make-up, sound effects and special effects, etc., and only the coordination of all aspects can present a superb visual feast. The development of modern science and technology not only brings new technology and means to the stage presentation, but also changes the audience's aesthetic orientation and audio-visual needs. In order to meet the audience's aesthetic orientation and audio-visual needs, stage designers must make a variety of modern science and technology in the design process of stage art can be presented and expressed, so that the unity of the stage effect services. For stage designers, the continuous application of new technologies, new techniques, new materials and digital media technologies also brings more novel design inspiration and diversified language expressions to designers. For the audience, the presentation of novel design inspirations and diversified language expressions with the aid of technology not only mobilises their visual and auditory senses, but also brings them a shocking audio-visual feast and sensory experience, which satisfies the aesthetic demand.

The perfect combination of modern science and technology with the stage makes the art of dance take on

new vigour and vitality.^[2] With the power of high-tech, through the extensive use of a variety of new stage instruments and equipment, so that the whole performance is rich in wonderful content, rich in change, full of whimsy. In line with the development of the times, we should always pay attention to the stage set design in the current new scientific and technological means, so that it can be used in the stage space set and presentation, to bring the audience a new visual experience. The development of science and technology for the stage visual means to add a lot of new performance elements for the stage creation provides more possibilities. This paper is only from the perspective of stage art space, from the stage space installation, digital media technology and the use of lighting to sort out and analyse how the intuitive stage art presentation of a variety of modern technical means integrated into the stage to form a unified stage visual language.

2. Integration of modern technology in the stage set installation

The development of modern technology promotes the diversified presentation of stage set installation art. The charm of stage performance art is not only embodied in the content and form of performing arts, but also more embodied in the use of modern science and technology on the stage, so that the artistic effect of stage performance can be presented. The integration with modern digital media technology and analysis of development strategy can bring new visual sense and sensory experience to the current opera culture.^[3] Even if it is a very complex stage set and its stage equipment, stage designers and their workers through the help of modern scientific and technological means, can be presented perfectly, to achieve the artistic effect of the stage designers want. For example, on 1 July 2021, the

* Corresponding author: dongyao.121@163.com

stage for the large-scale epic "Great Journey" to celebrate the 100th anniversary of the founding of the Communist Party of China was built in the National Stadium - Bird's Nest. The entire stage is about 200 metres long and 100 metres deep, with the main performance area covering about 10,000 square metres. The main performance area consists of a huge ramp in the middle combined with rotating stage machinery on both sides, of which there are also three 5-metre-square lifting stages in the front area of the stage, with a stage area of about 3,700 square metres. There is also a flip screen designed in the middle of the stage, which changes in conjunction with a number of stage mechanical devices such as rockers and lifting platforms in the front area. The entire stage uses CNC lifting devices to complete many difficult stage performances. For example, in the programme "New Heaven and Earth", which symbolises the 100-year history of the Communist Party of China, a 10-metre diameter drum slowly rises from the back of the main stage driven by a mechanical rocker, and the matching hundred small drums also slowly rise into the air under the action of the stage mechanical devices. The big drum at the back of the stage and the hundred snare drums in the air are performing to the rhythm of the music and the actors. And at the end of the show, accompanied by the melody of the theme song "Pilot", surrounded by singing, applause and 10 giant red flags, a huge 16 metres x 16 metres special party emblem was raised at the back of the stage and rose from a height of 39 metres to nearly 50 metres. These difficult stage mechanical devices were completed with the aid of modern CNC technology, providing a three-dimensional space for the scenario of the stage performance. In just a few decades, China's stage technology has gone through several iterations, from the optical era to the digital era, to the Internet era, to virtual reality (VR), augmented reality (AR), mixed reality (MR), and artificial intelligence (AI).

Although our country is a late starter in this respect, it has made some positive attempts and achieved certain results. In terms of technology promotion, the development of stage technology has been keeping pace with technological advancement in recent years.^[4] The arrival of the cognitive technology revolution based on information technology, the Internet and artificial intelligence technology has changed and is changing urban life, becoming the new normal of life in the new era. High-tech tools are also used in the stage design of the dance epic theatre *Only This Green*. *Only This Green* is a play based on the famous painting "Thousands of Miles of Rivers and Mountains" from the Song Dynasty. There are multiple time and space changes in the play, and the actors' stage scheduling is also changing along with the changes in the stage space. In order to accurately match the time-space interlocking narrative structure of the play, follow the perspective of a modern-day Forbidden City researcher into the inner world of Wang Ximeng, a teenage painter set up four concentric circles on the ground and three levels of stage installations in the air to match the interlocking narrative structure of the play. The four concentric circles on the

ground can be rotated in the same direction, in the opposite direction, or staggered under the action of the stage mechanism, which can be very good for the change of the actors' points on the stage. In order to make the performance on the stage as if a picture scroll through the millennium, the use of computer programming technology and the perfect combination of actors performing action, can make the stage concentric circle rotation changes very accurately. There are also air movement of three arc-shaped "scroll", but also with the ground concentric circles rotating at the same time, and is the ground rotating four times and the air rotating three times the organic cooperation. Such precise stage space changes, a good expression of the Chinese culture of the scroll rhyme, is the ancient and modern culture "collision", but also the perfect fusion of technology and art.

Taken the relations between art and modern science and technology as a starting point,^[5] The role of technology in the art of stage theatre is growing, and the effects it produces are becoming more and more obvious and have a greater impact on the audience. For example, the choreography of the stage drama "Never Fade Away Radio Waves" is based on the true story of martyr Li Bai, one of the "100 Heroes and Models Who Made Outstanding Contributions to the Founding of New China". The story takes place in Shanghai, in order to reflect the rhythm and characteristics of the old Shanghai, and also to reflect the rhythm and characteristics of the old Shanghai well with the performance of the dancers. Instead of simply bringing Shanghai's characteristic buildings such as laneways and shikumen onto the stage, the stage design uses 26 huge movable long mechanical backdrops that can subtly change with the dancers' movements and the progress of the play. These huge bar screens are combined, unfolded, rotated and changed under the unified scheduling of computer programming, which is the transformation of the whole stage space in line with the flow of water, providing flexible spatial changes for the movement of dancers and a wide space for the diversified needs of the narrative structure of the work. Without the guarantee of stage technology and mechanical devices, it is impossible to provide a flowing stage space for such a twisting and changing story. For example, in the part of the chase of the Man in Black, the huge background of the stage changes rhythmically with the movements of the actors on stage. The stage machinery creates rich changes in the stage space without overpowering the main character, perfectly creating the tense atmosphere of the chase of the Man in Black and giving the audience an immersive feeling. At the end of the strip backdrop and splicing combination of five or six street corners of the building, so that the scene of the stage was transformed. Through the stage machinery, the huge and clumsy looking bar screen becomes as light as the stage actors. The movement and combination of the background panels on the stage combined seamlessly with the highly visual aesthetics and vividness of the actors' physical movements, accurately presenting the inner mood and connotation of the story and leaving a deep impression on the audience.

3. Application of digital media technology in stage design

Exploration of contemporary art pay attention to pursue the beauty of inheritance of visual historical culture, emphasizes the modern beauty brought about by the integration of science and art, also pays special attention to the innovative beauty of cross border integration with related art categories. All of these put forward new requirements for the lighting designers in their creative ideas, creative methods and creative means.^[6] The intervention of digital media technology in stage performance opens up the forms of expression and expressiveness of stage art and enhances the ornamental nature of stage performance art. The same is the 100th anniversary of the founding of the party's large-scale epic "Great Journey" stage design, in the National Stadium - the Bird's Nest of the east that is, the rear of the main stage assembled a length of more than 170 metres, 29.5 metres high, more than 5,000 square metres of the façade into a curved giant wrap-around backdrop, coupled with the two outwardly extended 2,300 square metres of the flag shape of the side screen, high and low staggered formation of the flag shape, and the stage design is also the same as the stage design. The side screens are staggered to form a three-dimensional multi-level multimedia image space. In front of the main stage, a 30-metre-long, 9-metre-high giant tilting board flip LED screen is installed on the ground, which can be flipped up at a certain angle according to the needs of the performance to form a three-dimensional dynamic screen to match the performances of the actors. In the whole performance process, there is no traditional stage performance in the curtain transition, there is no host appearance, are through the screen image and lighting organic with changes to guide the whole performance process, flexible and smooth stage transition let the audience like in the party of the century journey. In the scenario of chorus and dance "War Flag is as Beautiful as a Picture", the back of the stage on the big screen playing the Shangganling Battlefield of the war smoke and the front of the stage performance area with the actors, both the historical image data, but also the reality of the real environment, through the digital media technology to make them organically fused together. Moreover, the reversible floor screen in the front area of the stage, when the performance reaches the climax, accompanies the performance of the actors and the rhythm of the music, and slowly rises up to form a huge slope. The snowy mountains on the screen echoed the continuous peaks on the main screen, and the actors kept climbing up the huge sloping screen to perform. This high degree of combination of real and virtual images greatly expanded the actors' performance space, brought a unique visual experience to the audience, and strengthened the audience's historical memory, helping to create an emotional atmosphere and aesthetic artistic mood. The use of digital media video technology in the performance of "Great Journey", a major theme of the centenary of the founding of the Party, can not only evoke the audience's historical memory and resonance,

but also sublimate the aesthetic sense of artistic creation, through the use of screens of different sizes to divide the space, the Bird's Nest, this oversized stage space is rich in layers and depth of field.

The iterative fusion of new theatre concepts and modern science and technology has expanded the audience's theatre experience with new media performances,^[7] as well as the dimension of the narrative function of the stage space, which has been expanded more deeply and broadly. In the play "Founding Ceremony Live", which is themed on telling the story of China, a number of ice screens with great depth were set up in the design of the stage space, and in cooperation with four cameras, the stage image technology of instant photography, instant editing and real-time screen casting was used to introduce the narrative technique of "montage" into the theatre performance. The whole play is presented in a highly technical, contemporary and innovative way. When the actors in the play appear as a group, the audience can not only visualise the performances on stage but also see all the scene images from the big screen, as well as close-ups and even close-ups of the faces of individual actors from the various sub-screens. This not only creates a collective atmosphere of unity, but also allows for the delicate transmission of individual emotions and moods, which greatly enriches the visual expression of the stage. In addition, the stage presentation also adopts a large number of "white space", which can further attract the audience's curiosity, let the audience explore the ups and downs, heart-wrenching true story, and can inspire the audience's patriotic feelings. With the continuous progress of society and the development of science and technology, people's pursuit of stage art is getting higher and higher, and stage art is also gradually presenting diversified and personalised development characteristics, especially the appearance of scientific and technological means in many stage works.

4. Integration of stage lighting and modern technology development

The use of multimedia technology in theatre has a certain history in the Western stage, and nowadays, with the rapid development of information technology, it is more and more diversified forms to participate in the creation of theatre.^[8] Scientific and technological development of people's production, life changes mapped to all aspects of stage performances, followed by changes in the objective aesthetic needs, forcing the stage space and stage technology innovation, stage lighting development, change and use is the most obvious witness. After the Renaissance, the earliest light sources on the indoor stage were torches, candles and oil lamps, and at this time the light source only assumed the role of lighting or decoration. After the Western Industrial Revolution, science and technology has been rapid development, the stage appeared gas lamps, carbon arc lamps and incandescent lamps, as well as specially designed for the stage and the stage lighting machinery and equipment. Through the stage lighting can be framed

stage in the visual space illusion to create a more perfect. In recent times, with the support of science and technology, the types of lights on the stage are not only more and more, but also more and more detailed, such as: tungsten light source, tungsten light source and incandescent light source. Such as: tungsten light source based stage spotlights, imaging lights, backlight and stage slides, etc. is the stage in the eighties and nineties on the main lamps and lanterns, and the use of colour changer also makes the stage above the enrichment of the stage, the stage lighting machinery and equipment from the analogue model has developed into a digital stage. The use of diode stage lighting is stage lighting to the new light source period, stage lighting is also more diverse, so that the stage performance of the atmosphere shaping and plot rendering more delicate. With the depth of modern technology and stage lighting fusion, but also to the expression of stage lighting has brought a diversity of means of expression, so that the stage lighting rendering effect is more rich, so that the stage performance is more expressive and infectious.

Stage lighting is the embodiment of great technological content, but also an important and indispensable means of stage modelling design, in the stage performance has an irreplaceable role. But undeniably, it is also a double-edged sword, how to use on stage need to have stage art embodiment, so that the expression of stage lighting with modern aesthetic concepts. The use of lighting in the dance drama "Never Fade Away Radio Waves" is the finishing touch to the whole stage charm and stage effect. In the lighting design of the airwaves, there is an intentional emphasis on the strong expression of the light beams, which should be made to have a sense of presence. For example, in the scene of the tailor's shop in search of the secret code, when the cold-coloured light shines out from behind the huge window hanging in the air, it creates a strong light and shadow effect on the stage, which makes the light have a strong sense of presence, and the shadows on the stage give people pressure, and even produce a mysterious contextual effect, which fully expresses the sharpness and angles of the actor's heart. And in the passage "Fishing Song", when the warm-coloured light shines on the 26 huge movable long background boards and the dancers, it forms interlaced projections on the stage floor, which can let the audience fully feel the warmth of the city life inside the Shanghai alley, and can inspire people's infinite reverie. Here, light and shadow are the main visual language, making the lighting vocabulary more relevant and the rhythm of the picture more layered. The increasing development of science and technology has also made the stage increasingly rich in form, and all kinds of high-tech means have made the stage art even more glamorous.

The role of technology in stage art is becoming more and more important, and its effect is becoming more and more obvious, and its influence on the audience is also getting bigger and bigger. However, we still need to have a sober understanding, although the stage technology has brought us an audio-visual shock, but it is still for the service of stage art, must not put the cart before the horse. No matter what kind of technical means,

not the more the better, the effect is the best result. In the dance epic theatre "only this green" in order to show a thousand miles of river and mountain picture inside the unique aesthetics of the Song Dynasty temperament. As well as Chinese classical aesthetics in the mood, lighting designer Ren Dongsheng used the "less than more, simple than complex" artistic approach, so that the entire stage space and the dancers' body rich in "poetry" to create a "silent The whole stage space and the dancers' bodies are full of "poetry", which creates the artistic realm of "no sound is better than sound". For example, in the chapter of "Singing Silk", when the dancers' "poetic" limbs are slowly shown in silhouette with the change of lights on the stage, a lot of white space and Zen stage mood can make the audience feel like wandering away from a thousand-year painting scroll. It inspires the audience's infinite reverie and ignites their deep love for traditional Chinese culture. The use of modern stage lighting technology to express the illusion, mood, so that the light becomes a unique vocabulary, designed to combine into a specific stage language, so that the traditional Chinese culture and modern spirit of the audience in the psychological resonance, giving the traditional culture unlimited vitality. The use of lighting in dance theatre is not only to set the atmosphere of the whole environment, but also to strengthen the image of the characters in the dance theatre, so that the dancers can express themselves in the way of physical narrative and form a unique artistic style.

5. Conclusion

The use of modern science and technology in stage art has injected infinite vitality and vigour into the development of stage art, enabling it to keep abreast of the times and be closer to the actual needs of the audience. People's way of life is slowly changing with the development of science and technology, which will bring a new life experience and aesthetic enjoyment, and will certainly make the traditional way of presenting stage art change. Of course, with the progress of the times, we should continue to explore a variety of scientific and technological means that can be used in stage design, so that the presentation of stage art is more colourful under the impetus of modern science and technology, giving the audience a new audio-visual aesthetic experience. At the same time, the use of modern science and technology can also help to strengthen the stage image, stage atmosphere, with new technical means to express different stage elements, mobilise the audience's enthusiasm, and strengthen the stage effect. From this point of view, the intervention of science and technology is actually artificial, in order to make the stage art better spread among the audience. Art needs innovation and development, and the combination of modern science and technology with it undoubtedly greatly enriches its artistic expression and infectious power, and further expands the space of performance. The fusion of stage and technology has injected fresh blood into the art of dance, making it vibrant and further developing and prospering. The creation of

choreographic space for modern theatre is also the creation of images,^[9] The continuous integration of technology and art will also stimulate new ideas and new possibilities for stage art innovation, whether in stage design, actor performance or viewing relationships, all need to have new thinking and exploration, so as to frame the new aesthetic form of the stage, to meet the future aesthetic needs and experience. Therefore, from this point of view, the integration of stage and technology will become an inevitable trend. In modern society, the development of science and technology represents a kind of spirit and new power, which is a concrete embodiment of innovation and civilisation, how to better integrate science and technology with the art of dance, so as to make the unique charms of the stage art to be fully demonstrated, more dazzling, and bring more aesthetics to the audience should also become a problem for all the workers of dance art to It should also become a matter of serious thinking for all dance artists.

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