A Study on the Impact of Modern Technological Development on the Form of Music Concerts

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Abstract

In the era of continuous progress, concerts have emerged as a significant medium for music performance, providing audiences with both musical enjoyment and a means of relaxation. The study examines pivotal moments and milestones in concert history, highlighting the emergence of novel elements such as visual presentations, integration of multimedia, virtual reality experiences, and metaverse concerts. By scrutinizing the repercussions of these changes on the concert experience, the study sheds light on the transformative influence of technology on concert formats, audience engagement, and artistic expression. Moreover, it delves into the challenges and opportunities arising from technological advancements in the contemporary concert landscape. The insights gained from this research contribute to a comprehensive comprehension of the dynamic interplay between technology and concert forms, thereby laying the foundation for future scholarly discourse and advancements within the field.

Keywords: Music Concerts, Concert Formats, VR Technology, Visual Innovation, Technological Development

1. Introduction

With the advancement of technology and the consequent improvement in quality of life, there has been an increased emphasis on spiritual fulfillment. Consequently, music concerts have become an integral part of people's leisure activities, representing a significant cultural phenomenon in contemporary society with substantial influence. As a vibrant cultural landscape, concerts have witnessed various transformations and advancements resulting from environmental factors and the integration of digital technologies, enhancing the overall concert experience. The progress in virtual reality technology, as well as the emergence of technologies such as the Metaverse, has brought about profound changes to the concert domain. As the pandemic subsides and individuals gradually resume their customary entertainment routines, the subsequent evolution of concerts, incorporating further integration of emerging technologies, holds promising prospects for future development.

2. Theoretical Background

Music Concerts trace their origins back to *Charles Knyvett* and *Samuel Harrison*, both renowned singers associated with the *Concerts of Ancient Music*. The inaugural concert took place on February 11, 1792, at Willis's Rooms. Over time, the concert landscape has witnessed significant transformations driven by evolving societal norms and technological advancements.

Noteworthy milestones include the historical performance at Wilbraham Railway Station on May 7, 1964, featuring renowned artists such as *Sister Rosetta Tharpe* and *Muddy Waters*. Additionally, on April 7, 1966, The Velvet Underground incorporated a large projection screen for visually immersive presentations. In 1981, Kraftwerk innovatively integrated live performers with on-screen replicas during their rendition of "Robots". Furthermore, Teresa Teng introduced lighting, dance, and costume modeling into concerts for the first time in 1982. In the year 2000, *Madonna* made history as the first artist to hold an online concert, breaking new ground in the realm of virtual performances. A significant milestone in 2010 was the large-scale 3D CG virtual character concert featuring *Hatsune Miku*. In 2019, electronic musician *Marshmello* captivated audiences by holding a metaverse concert within the popular game "Fortnite".

According to data from the *WORLD CITY CULTURE FORUM*, numerous countries host an impressive number of concerts each year, reaching five figures. This means that, on average, around 30 concerts are held daily in different locations, illustrating the pervasive presence of concerts in people's lives.

3. Analysis of Typical Case

3.1 The Early Basic Forms

On May 7, 1964, big names such as *Sister Rosetta Tharpe* and *Muddy Waters* performed at the disused Wilbraham railway station in south Manchester. The producer wanted to simulate the scenes of the Great South of the United States here, so he specially arranged posters and laundry tubs with a sense of region, as shown in Figure 1. At the same time, in order to make the audience more immersive, there will be chickens and sheep "walking" freely in the venue during the performance.

Figure 1. Wilbraham Train Station Performance Scene

3.2 The Midterm Basic Forms

On April 7, 1966, The Velvet Underground used a large projection screen for visual display. Different images were projected behind the singer, creating a unique visual sense. In the 1982 Hong Kong Queen Elizabeth Stadium concert, Teresa Teng integrated the band, lighting, dance, and stage performances into the concert for the first time, and also broke through the tradition with the image of afro heads, tights, and miniskirts. Her behavior of interacting and shaking hands with the audience during the performance made

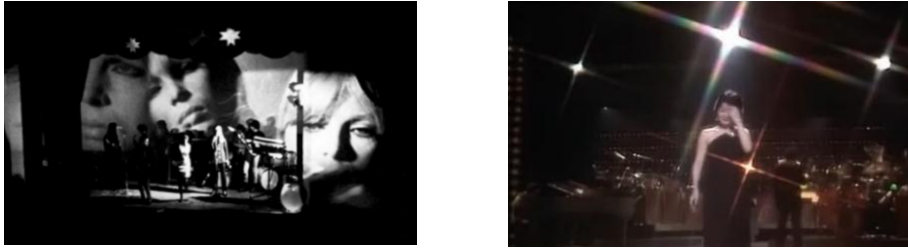Hong Kong and Taiwan singers at that time follow suit.

Figure 2. 1996 The Velvet Underground and 1987 Teresa Teng performance scene

3.3 The Late Basic Forms

In 2000, Madonna became the first singer in the world to hold an online concert. According to *news24*, only 3,500 people were able to attend Tuesday night's show in south London, but the show was broadcast live over the Internet, and Microsoft's MSN predicted it would be the largest online concert in history at the time. While there were still plenty of issues at the time, one frustrated user wrote on Madonna's message board: "I had a nervous breakdown trying to get in touch." In terms of online live broadcast technology that has never been done before, it has taken a big step forward.

On March 9, 2010, Sega held Hatsune Miku's solo concert in Tokyo, Japan. Wikipedia wrote that this concert made Hatsune Miku the first virtual idol in the history of human civilization to use semi-holographic (2.5D) projection technology to hold a concert. This concert uses the "Dilad Screen" 2.5D semi-holographic transparent screen of Japan's KIMOTO company to play 2.5D images. In simple terms, it is to project stereoscopic images onto screens made of different transparency, and adopt dual projection technology.

Figure 3. *Hatsune Miku* Performance Screen Performance Scene

3.4 The Present Basic Forms

In 2019, electronic musician "Marshmello" Marshmello held a concert in the game "Fortnite", opening the door to the metaverse concert. According to *NFT News*，in November 2021, Canadian singer Justin Bieber cooperated with the virtual concert company Wave VR to present a 30-minute metaverse concert to fans around the world. Through the power of technology, the audience is brought an immersive interactive experience integrating games, real-time motion capture and live music performance. The background of the whole performance is very gorgeous, with golden wheat fields, golden sunlight, and golden fireflies rising from the grass, which can more appropriately express the connotation conveyed by the music. With the blessing of virtual scenes, although Bieber is not as vivid as a real person, it can cover up some deficiencies in traditional concerts, such as the singer's tone and image.
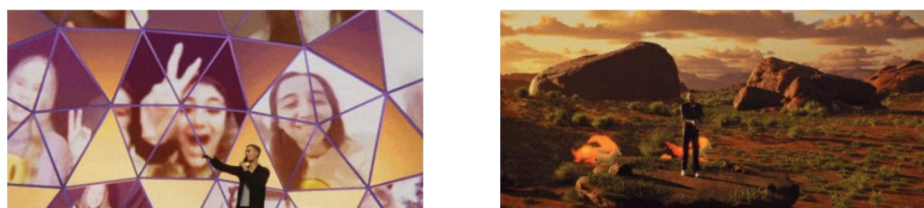
Figure 4. *Justin Bieber* **Performance Scene**

In 2020, the new crown pneumonia epidemic has swept the world, and all walks of life have encountered a severe winter, and the cultural and entertainment industries have been seriously damaged. Various performances had to be stopped. In mid-April 2020, Star Museum Entertainment announced that its *Super M* group will hold its first online concert on April 26. The concert will provide live concert streaming service *Beyond LIVE*. Beyond LIVE is a new live concert streaming service jointly launched by Star Museum Entertainment and Naver. Fans can connect in real time and live through Beyond LIVE, and the concert form in the epidemic era was born.

3.5 Evolution of the Concert Format

Combined with the analysis of actual cases in the third chapter, we can find that with the advancement of technology, the form of concerts is also constantly changing. Based on this, I have summarized several staged developments and changes of the concert from the perspectives of the concert's visual form, hardware support, and audience viewing methods. For details, refer to Table 1. Additionally, through the examination of specific music concert examples, this analysis elucidates the implications of these changes on aspects such as audience engagement, artistic expression, and the overall concert experience. The findings presented in Table 1 shed light on the multifaceted factors that have propelled the evolution of music concert formats, thereby contributing to a comprehensive comprehension of the constantly evolving dynamics within the domain of live music performances.

Table 1. Evolution of the Music Concerts

Time	Place	Actor	Visual Form	Hardware Support	Viewing Method	Interactive Mode
17th century	Performer's Home	singer	none	musical instrument	live	On-site interaction
1960s	Non-dedicated Venue	singer	Real scene /projection	musical instruments, microphones, recorders	Live, post-production DVD	On-site interaction
1980s	Dedicated Venue	singer and band	Real scene /projection	Broadcaster	Live, TV, Webcast	On-site interaction
1990s	Dedicated Venue	singer and band /dancer	Rely heavily on LEDs	Internet	Live, TV, Webcast	On-site interaction
2010	Dedicated Venue	Virtual characters	2.5D projection Holographic projection	Holographic projection screen	Live, TV, Webcast	On-site interaction
2019	Dedicated Venue	virtual form of the real person	Metaverse full virtual	Virtual reality technology,	Real-time access to the platform, post-platback	direct in-game interaction

				platform blessing		
2020	Dedicated Venue	singer and band /dancer	Beyond live online	online streaming service	Online live broadcast, post-playback	Real-time connection interaction, barrage interaction

4. Discussion

When music takes the stage, the proximity between the audience and performers diminishes, ushering in significant transformations in the concert format. Historically, concerts primarily revolved around music performances, with artists standing on stage and engaging the audience through their musical and vocal prowess. However, propelled by technological advancements and the increasing demand for immersive entertainment experiences, concerts have evolved into comprehensive performances, offering a remarkable blend of creativity and audio-visual spectacle.

Modern concerts incorporate numerous elements, including lighting, dance, visual effects, and stage design, moving beyond a sole reliance on musical performances. Artists now express themselves through choreographed dances and elaborate stage presentations. Interactivity has emerged as a prominent feature of contemporary concerts, with audiences transitioning from passive observers to active participants. Through projection technology, audience members engage with performers, interact with virtual characters on stage, and even partake in on-stage performances. Video projection technology employs projectors to display images or video content on large screens, stage backgrounds, or curtains, enhancing visual aesthetics and the overall concert experience. This interactive dimension offers audiences the opportunity to forge a closer connection with artists, fostering liveliness and interest throughout the concert. Real-time rendering techniques facilitate the creation of virtual environments, special effects, and animations, infusing concerts with visual creativity and appeal.

Moreover, live broadcasting and online streaming have become commonplace, enabling a global audience to participate simultaneously. Concurrently, concerts embrace XR scenes that integrate VR, AR, and MR, along with diversified interactive modes. VR technology allows artists to perform on virtual stages, transporting the audience to immersive, digital environments, where they can interact with the performers up close. AR technology overlays virtual elements onto the physical stage, creating an interactive experience that merges the virtual and real world. Through AR, artists can appear on the actual stage, interacting with physical elements and captivating the audience with unique visual effects. MR technology seamlessly combines virtual and real-world elements, heightening interactivity within the concert. Audiences witness the integration of virtual stage elements with tangible components, resulting in enhanced visual impact and creativity. Singers traverse between virtual and physical scenes, enriching the spatial dimension of their performances and augmenting the audience's immersive viewing experience.

Furthermore, the advent of metaverse technology injects boundless vitality into concert development. Through cloud gaming and streaming media technologies, audiences can access concert metaverses via network connections. They can enjoy live concerts on their personal devices, engaging in virtual interactions and events without being physically present. This technology enables broader audience participation, fostering interactions, conversations, and collaborations among audience members, artists, and virtual characters, creating a sense of collective engagement. The multi-user experience enhances audience engagement and yields a more personalized concert experience, replete with richness and depth.

5. Conclusion

To sum up, the format of concerts has undergone a major transformation in order to adapt to the ever-evolving technological environment. Advances in technology have revolutionized concerts, moving beyond simple sound and light setups to deliver a more immersive, innovative and engaging experience. The incorporation of new technologies has expanded the possibilities of creativity and expression, enabling artists to transcend the constraints of tradition to deliver extraordinary performances that captivate audiences. In addition, judging from today's concerts, the audience's role has changed from passive audience to active participants, interactive and social media channels facilitate meaningful interactions between artists and concertgoers. The fusion of multimedia elements, immersive experience and creative stage design has become an integral part of contemporary concerts, enhancing the audience's musical experience and bringing a visual feast. These changes not only enrich the entertainment value of concerts, but also stimulate continuous development and innovation in the field of artistic expression. Although the current virtual concert may not be able to fully achieve full immersion, it is undeniable that the diversified development of technology has opened up new avenues for the performance experience.

Therefore, in order to adapt to this ever-changing situation, people who study related subjects should have a comprehensive understanding of virtual reality and augmented reality technology, and at the same time master the software and tools related to VR and AR. This proficiency will enable the creation of immersive virtual experiences, including elements such as stage design, interactive features and visual effects.

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