The Birth of Large-Scale Contemporary Art: From Technological Advances to Spatial Expansion

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Abstract: The article attempts to analyse the factors behind the rise of 'large-scale' artworks in contemporary art, considering both the 'technical environment' and the 'display environment.' Regarding the technical environment, industrial production has progressively become a facilitator of artistic creation, enabling the realization of large-scale works through advancements in techniques and materials. Simultaneously, the advent of digital technology has expanded the scale standards for artworks, transitioning from 'physical scale' to 'virtual scale,' granting artworks the freedom to extend without constraints. Concerning the exhibition environment, the spaces dedicated to displaying artworks have undergone expansion since the mid-20th century. This expansion encompasses two aspects: firstly, the venues for showcasing artworks have broadened from indoor settings to encompass urban and natural environments. Secondly, the emergence of modern art museums and the repurposing of industrial spaces have created favourable spatial conditions for exhibiting large-scale contemporary artworks.

Keywords: Contemporary art; Large-scale; Technology; Space

1. Introduction

Large-scale art has been present since ancient times, with its origins traceable to various artistic traditions in different regions. From Egyptian statues to ancient Greek hero sculptures and Chinese Buddha stone carvings, early large-scale artworks primarily drew inspiration from religious or mythological figures. They achieved a stunning visual impact through their immense size, emphasizing the sacredness and awe-inspiring qualities of the works. Behind the largeness of classical art lies a form of visual authority. By creating an upward viewing angle through significant height differences in the works, an act of visual intrusion upon the viewers is realized. Additionally, the colossal allocation of human and material resources in the artistic process symbolizes the artwork as an "emblem of power." [1][2]. However, in contemporary art, artworks of various types are also presented on a large scale in art exhibitions and urban spaces. These may include canvas paintings, mixed-media works, installation art, and new media art, among others. These different types of artworks convey various meanings. Some use their massive size to amplify emotional tension, creating immersive art experiences for viewers. Others use "largeness" to enhance the visual impact of the artwork, controlling the viewing process and highlighting the "smallness" and "powerlessness" of the act of viewing. Artists like Claes Oldenburg challenge viewers' accustomed perspectives by enlarging everyday objects' scale and attempting to subvert the relationship between art subjects and everyday items through "scale manipulation"[3]. As Eli Anapur states, 'large' has become an important method and form of expression in contemporary art creation and has gradually become one of the dominant factors in contemporary art aesthetics [4].

If the "largeness" in classical art is rooted in the need for the sacred and intimidating, what are the production motivations behind the "largeness" in contemporary art? Before discussing this, it is essential to define "large" since judgments of "size" are relative, with no absolute standards. Different studies use terms like "dimension," "scale," "volume," and "magnitude" when discussing the size of artworks, each with slightly different connotations. To explore the "large scale" of contemporary artworks, this research adopts the concept of "scale" from architecture. In architecture, "scale" does not equate to absolute "size" but emphasizes a relative relationship, usually defined by the proportion between an object and the human body or other objects [5]. Regarding the "large scale" of contemporary art, various scholars have brought different dimensions to the discussion. Yang Lei discusses the use of "large" as an artistic technique in contemporary Chinese painting. While large-scale paintings have a long history, within the context of contemporary art, the size of artworks is related to the artist's era, interests, life experiences, and themes.
undermine human creativity and diminish the quality of artworks. Walter Benjamin also mentioned in his book *The Work of Art in the Age of Mechanical Reproduction* that mechanical reproduction made the art creation process standardized and mechanized, gradually causing artworks to lose their "aura," uniqueness, and authenticity, thereby weakening the value and meaning of art. However, Benjamin did not entirely reject technology; he believed that the use of technology could reduce the production costs of artworks, improve the efficiency of artistic creation, and promote the popularization and democratization of art.

In the mid-20th century, the term "contemporary art" began to appear frequently in the field of art criticism. Although its academic origins are not universally agreed upon, it is often related to the artistic development processes of different countries. However, it is clear that contemporary art differs significantly from modern and classical art in terms of creative concepts and expressive media. In this context, artists' attitudes toward technology also began to change. Technology was no longer something that artists feared but gradually became a part of artistic creation. Andy Warhol, an artist who straddled the line between "modern" and "contemporary," introduced his Pop Art works to the public, stating that "art should not belong exclusively to the elite but should be something everyone needs, like air and water." Through his works, Andy Warhol attempted to popularize art boldly, using various replication methods such as printing, gilding techniques, and photo projection in his artistic creation. In the late 1960s, he used silk-screen printing technology to create iconic works like *Campbell Soup Cans*, *Marilyn Monroe* and *Dollar Sign*. Among these works were some large-scale pieces. In the past, silk-screen printing was primarily used for outdoor advertising and industrial image production. With the help of this technology, artists could quickly increase the output of their works, producing repetitive and large-scale images to expand the dissemination of art. The large scale of Warhol's works stemmed not only from the individual size of the pieces but also from the collage combination of identical images rich in commercial symbols. By juxtaposing numerous identical images with strong commercial symbols, he conveyed people's spiritual state lost in commercial civilization. Furthermore, in the mid-20th century, "installation art" and "public art" began to establish closer links with industrial technology. Taking minimalist sculptor Richard Serra as an example, his works often explored the relationship between humans and space and matter through their enormous scale. However, these works, made of wrought iron, could not be achieved solely through an artist's individual skills. Therefore, artists needed to collaborate with steel mills and utilize various industrial equipment to complete their works. Although this "collaboration" often caused artists to lose control over the final outcome of their works, as the actual...
results of industrial production often differed from the artist's vision. Introducing industrial technology into art creation not only changed the way artworks were produced but also affected the presentation forms of artworks. In terms of production methods, industrial technology replaced traditional craftsmanship, increasing the speed of art creation and improving production efficiency. This allowed artists to create a large number of artworks in a shorter period, thereby achieving higher economic value. However, it also influenced the relationship between artists and their artworks. In traditional handicraft art production, artists could create their works and control the entire production process. However, with the introduction of industrial production technology, artworks were no longer the result of an artist's individual labor but rather a joint achievement of humans and machines. In terms of presentation forms, the new production methods served as auxiliary tools, enabling artists to realize their large-scale artistic concepts and providing strong technical support.

2.2. Digitalization and Virtual Scale

In the 21st century, a plethora of new technologies emerged, enriching the forms of technology that artists could leverage and utilize. Among them, the advent of digital technology brought about a new revolution in art production. Simultaneously, digital technology provided new standards for the scale of artworks. On the one hand, artworks in the realm of digital technology transitioned from "physical scale" to "virtual scale," where the size of the artwork can be altered based on the intended visual effect. On the other hand, digital technology enables precise control and adjustment of the dimensions of artworks, meaning that artists can better present the details and effects of their work. For example, the art collective TeamLab's series of works delve into the relationships between nature, technology, art, and humanity through digital art. In 2018, their work the Borderless was exhibited at the Tokyo Digital Art Museum. Utilizing digital technology and projection, artists created a series of borderless and infinitely versatile art spaces, allowing viewers to freely explore, interact, and experience. These digitally infused spaces encompassed themes such as forests, the cosmos, and the ocean, each creating an effect of boundlessness. The Borderless aimed to break down the boundaries between "art and the audience," and "self and others." TeamLab's digital art pieces do not have physical entities and are presented in exhibition spaces, with the space and the artwork complementing each other. The scale of their works can be adjusted with changes in the space, and "large scale" is a crucial condition for creating immersive experiences.

Apart from immersive art, some artists use digital technology to create large-scale artworks with physical entities. In 2012, artist Sui Jianguo began creating Garden in the Clouds series of works (Figure 1). These massive sculptures were not handcrafted but were created using digital scanning and 3D printing technology. The process involved digitally scanning clay sculptures crafted by the artist, enlarging the data, and finally using photosensitive resin material for printing. Visually, the works retained the "hand-made" texture in the form of "palm prints," while the materials and technology used conveyed a sense of "technology," creating a strong contrast and even contradiction between the two visual senses. This contradiction is the result of the joint efforts of the artist and modern technology. Sui Jianguo mentioned in an interview that without 3D printing technology, the fine lines created by handcrafting would not have been presented. Extreme enlargement turns the sense of touch into vision. In his works, "scale" serves as a means to magnify the visual experience, focusing the audience on the process and details of sculpture making. This kind of large-scale visual realization requires both artistic conception and technical support. However, during the creative process, artists and technology need to adapt to each other. For example, the issue of "seams" that arise from 3D printing stems from the inherent flaws in the technology's materials. As the "enlargement" technology amplifies these flaws, the artist eventually accepts and presents them in the final work. Perhaps, as Jacques Ellul suggested, there
exists a mutually dependent relationship between art and technology [15]. Technological advancement provides artists with more materials and tools, while art can also stimulate the innovation and progress of technology, offering inspiration and direction for its development.

3. The Spatial Expansion of Art Exhibition

3.1. The Rise of Modern Cities

At the end of the 19th and the beginning of the 20th century, a "City Beautiful Movement" led by the middle class, landscape planners, and architects swept through many North American cities, including Chicago and Washington. This movement aimed to address a series of urban issues, including ecological concerns, urban congestion, and monotonous landscapes, through urban landscape design [16]. While the City Beautiful Movement did not last long and faced criticism from academia, it presented an opportunity for the development of "public art." Large-scale urban sculptures and buildings suddenly became symbols of city and national identity, as well as cultural symbols representing different regional environments. Among the most iconic works is the Statue of Liberty, created by artist Frédéric Bartholdi in 1886. This colossal sculpture, standing at 93 meters including its pedestal and weighing approximately 204 tons, symbolizes the ideals of freedom and opportunity in the United States. Another noteworthy piece is the Columbus Circle designed by Gian Lorenzo Bernini, named after Christopher Columbus and symbolizing the spirit of continuous exploration and discovery. These artworks, bearing the image of the city or nation, were of immense scale and contained distinct political themes. Entering the mid-20th century, under the wave of a new round of urban renewal movements, public art began to receive more direct policy and financial support. Cities like Philadelphia, Baltimore, and Los Angeles implemented the Percent for Art ordinances, stipulating that 1% of the budget for municipal or other public institution building projects must be allocated to the purchase or commissioning of artworks to enhance the city's cultural and artistic atmosphere [17]. The enactment of the Percent for Art ordinances provided more direct policy and financial support for the integration of art into urban development, creating objective conditions for the creation of large-scale art pieces.

Beyond the United States, the British government at the end of the 20th century also proposed strategies for enhancing urban image through public art and viewed the creative industries as an essential sector driving socio-economic development [18]. Taking Trafalgar Square in London as an example, starting in 1999, the Fourth Plinth on the square occasionally displayed large artworks created by contemporary artists. Due to the substantial size of the Fourth Plinth itself, approximately 14 feet in height, artworks needed to be designed in harmony with its dimensions. Over two decades, a total of 13 art pieces were exhibited, including Heather Phillipson's End Really Good (2020), Michael Rakowitz's The Invisible Enemy Should Not Exist (2018), and David Shrigley's Really Good (2016). These works expressed the artists' concerns about society and public issues, addressing topics like consumerism, war, income inequality, and feminism. Through their massive scale, they captured the public's attention and engaged them in discussions on social issues. The rise of modern cities and the subsequent wave of urban landscape development provided direct policy and financial support for the emergence of public art and the creation of large-scale public artworks. Art is no longer confined to items displayed in art galleries but has become an integral part of cities, used to shape national and city identities, engage in public cultural and artistic education, and serve as a mode of contemporary cultural expression.

3.2. The Integration of Art and Nature

In addition to the rise of modern cities, the emergence of art forms like Land Art and Site-specific Art provided nourishment for the development of large-scale contemporary art in a new way. In 1970, artist Robert Smithson initiated his creation project by constructing a massive spiral artwork called the Spiral Jetty (1970) beside the Great Salt Lake in Utah. This artwork, composed of basalt, crystalline salt, and algae, can be seen as an attempt to merge art and nature, blurring the boundaries and settings for displaying artworks [19]. However, Robert was not the only artist attempting to create artworks within natural spaces. Starting from the 1960s, "Earth Art" gradually emerged as an art style in the United States. Artists moved away from museums, art galleries, and studios, choosing deserts, wastelands, wilderness, and coastlines as exhibition spaces for their artworks. The emergence of Earth Art was closely related to the "environmental protection movement" of the 1960s [20]. Through the methods of "sourcing from nature" and "displaying in nature," artists reflected on industrial civilization and commercial culture, exploring the relationship between humans and nature. Early representatives of Earth Art included works like Michael Heizer's Double Negative (1969), Dennis Oppenheim's Cancelled Crop (1969), and De
Maria's *Lightning Field* (1977). The artwork *Wrapped Coast* by the French artists Christo and Jeanne-Claude became one of the largest art pieces at the end of the 1960s (Figure 2). The artists enveloped the entire coastline of Little Bay in Sydney with white fabric. This project spanned approximately 2.5 kilometers of coastline and cliffs and used nearly 95,600 square meters of synthetic fabric. Crawford described Christo's work as "monumental," achieving striking visual appeal through its massive scale, substantial material consumption, and intricate engineering [21]. These diverse forms of artwork expanded their display spaces beyond indoor exhibition venues and urban settings, enabling interaction between art and the natural environment.

![Figure 2: Christo and Jeanne-Claude, Wrapped Coast (1969)](image)

During the same period as the emergence of Land Art, the form of "Site-specific Art" began to appear, often intertwined with "Land Art" and "Public Art." The key difference between them lies in Land Art emphasizing the relationship between artworks and "nature," while Public Art focusing on the interaction between art and "urban" spaces, and Site-specific Art highlighting the dual attributes of the "site" as both the display location and the creative material of the artwork. The display location can be in natural settings or in outdoor or specific venues within the city. Starting in the 1960s, artists including Patricia Johanson, Athena Tacha, began presenting their artworks in specific exhibition spaces. Some of these works were highly controversial, such as Richard Serra's *Tilted Arc* (1981). He placed a 37-meter long, approximately 3.7-meter-high wall of raw steel in Federal Plaza in Manhattan. This work not only physically divided the originally open public space but also created a rift between art and the public [23]. Furthermore, there were highly successful Site-specific artworks, like Ann Hamilton's *The Event of a Thread* (2012). As an artist with a background in textile design, she used "weaving" as her artistic language, interacting with different spatial environments using materials of various textures. In *The Event of a Thread* Hamilton introduced 48 swings into the Wade Thompson Drill Hall in New York's Park Avenue Armory, an area of approximately 55,000 square feet. These swings hung from a height of 80 meters, allowing exhibition visitors to swing in the vast space. For these Site-specific artworks, the space itself became an integral part of the artwork. "Earth Art" used natural environments as the locations for displaying artworks, expanding the space for artistic creation and exhibition beyond Public Art. The emergence of "Site-specific Art" further enhanced the connection between space and artwork, promoting the creation of works that are "born for the site." At this point, space transcended its existence as a mere backdrop for art exhibitions and became an integral part of the artwork.

### 3.3. Modernist Architecture and Post-Industrial Spaces

Apart from the aforementioned factors, in the mid-20th century, under the influence of the modernist architectural movement, the design and construction of new art galleries and museums created objective conditions for the "largeness" of contemporary art. Firstly, the design styles of art galleries and museums transitioned from 19th-century classical decorative styles to modernist styles, with a focus on "functionality" and "utility" during this period. Secondly, as cultural spaces with a public nature, their displays shifted from elitist audiences to the general public. Therefore, more expansive exhibition spaces became a factor to consider in their design. Moreover, in the design process, the multifaceted role of the venue needed to be considered, not just its function as an art exhibition space [24]. In the mid to late 20th century, many new museum buildings were constructed, including the Solomon R. Guggenheim Museum completed in 1959, the Getty Center opened in 1974, and the Centre Pompidou in Paris, completed in 1977. When designing the Centre Pompidou, Piano and Rogers proposed that this massive building should integrate multiple public functions, serving as a place for gatherings, learning, entertainment, and
socializing [25]. Covering an area of 7,500 square meters, the Centre Pompidou earned the nickname "cultural factory" due to its highly industrial "High-tech" architectural appearance and its departure from classical architectural traditions. The interior of the building extensively used movable partitions, allowing structural adjustments to accommodate various exhibition needs.

Of particular note is the coupling of "post-industrial spaces" with art in the latter half of the 20th century. In his theory of the post-industrial society, Daniel Bell mentioned that post-industrial societies rely on the tertiary sector as their primary industry and can transform the landscapes of industrial society by repurposing brownfield sites [26]. Faced with abandoned industrial buildings from the industrial era, one way to repurpose them is by adding cultural and emotional value, transforming them into places that carry "local historical memories" [27]. Examples include the Tate Modern in London, the Kaohsiung Pier-2 Art Center (converted from a port warehouse), the Beijing 798 Art District, the Chengdu Eastern Suburb Memory, and the Shanghai 80,000-ton Silo, among others. These art spaces, repurposed from industrial sites, often retained their original structures and dimensions. The large-scale of these industrial spaces from the past directly influenced the development of large-scale contemporary art.

The Tate Modern, formerly a riverside power station, provides a prime example. Its "Turbine Hall," once a turbine engine room, was transformed into a gallery space, measuring 152 meters in length, 24 meters in width, and 35 meters in height. It is currently one of the most important exhibition spaces for contemporary art worldwide. The vastness of this space provides an excellent environment for the creation and exhibition of large-scale artworks by contemporary artists. In 2000, Louise Bourgeois presented the first exhibition in the Turbine Hall, titled I Do, I Undo, I Redo featuring three 9-meter-tall steel towers representing three phases of the artist's career (Figure 3). The massive scale of these artworks created a powerful emotional tension. Since its opening, Tate Modern invites a contemporary artist every year to create art within the 3,400-square-meter hall. From the inaugural exhibition onwards, the museum has hosted over twenty contemporary art exhibitions, including Olafur Eliasson's Weather Project (2003) and Carsten Höller's Test Site (2006), all of which showcased artworks on an enormous scale.

Figure 3: Louise Bourgeois, I Do, I Undo, I Redo (2000) [28]

4. Conclusions

The emergence of large-scale contemporary art has been an intriguing journey influenced by a myriad of factors, culminating in a transformative landscape for artistic expression. This evolution can be attributed to various elements, each playing a crucial role. Firstly, the advent of digital technology in the 21st century marked a significant turning point. It not only revolutionized the production of art but also introduced a new dimension to the scale of artworks. In the realm of digital art, the concept of "virtual scale" emerged, allowing artworks to change in size based on the intended visual impact. This newfound precision in controlling dimensions enabled artists to showcase intricate details and effects, exemplified by works such as TeamLab's Borderless, which created limitless, immersive spaces exploring the interplay between nature, technology, art, and humanity. Secondly, the expansion of public art was facilitated by the rise of modern cities. The "City Beautiful Movement" in the late 19th and early 20th centuries, coupled with urban planners and architects' efforts, aimed to beautify cities while addressing ecological concerns, overcrowding, and monotonous landscapes. Although the movement was relatively short-lived and faced criticism, it laid the foundation for the development of "public art." Large-scale
urban sculptures and buildings became symbols of city and national identity, reflecting regional cultural strategies. Additionally, policies like the Percent for Art initiative in the United States, which allocated 1% of public building budgets to art, contributed to the creation of large-scale public art. This legislation provided concrete support for incorporating artworks into urban development, nurturing the conditions for large-scale art creation.

Thirdly, art fused with nature, and the rise of forms like Land Art and Site-specific Art further enriched the canvas for large-scale contemporary art. Artists ventured beyond museums and galleries to embrace deserts, wastelands, plains, and coastlines as exhibition spaces. This trend emerged alongside the 1960s environmental protection movement, using nature as both inspiration and backdrop. These art forms extended the realm of art beyond traditional settings, allowing space itself to become an integral component of the artwork. Lastly, the influence of modernist architecture and post-industrial spaces cannot be overlooked. Modernist architectural trends led to the creation of innovative art museums and galleries with a focus on functionality and adaptability. These venues shifted their attention from elitist to more inclusive audiences, necessitating more extensive exhibition spaces. Moreover, the repurposing of post-industrial spaces for art in the latter half of the 20th century breathed new life into large-scale art. Abandoned factories and warehouses became transformative cultural landscapes, preserving their original structures and dimensions. These industrial-sized spaces provided ideal environments for the creation and exhibition of large-scale contemporary artworks. In summary, the birth of large-scale contemporary art is a multi-faceted journey that encompasses technological evolution, urban development, integration with nature, architectural innovation, and repurposing of industrial spaces. These dynamic factors have not only expanded the horizons of artistic expression but have also brought contemporary art closer to the public, enriching our cultural landscapes with immense and impactful creations.

References


