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Investigating the Impact of Video Mapping on Environmental Graphics and Audience Attraction: A Case Study of Successful Executive Video Mapping in Iran

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Research Article

Abstract

The use of advanced technologies of "holography" and "videoamping" in Theater and performing arts directors and designers have been interested in holography and video-amping technologies for the past decade, and it is expected that these technologies will be used more widely in theater and other live arts in the coming years. Theater and technology are complementary in most advanced countries today. While it is clear that theater and technology must be synchronized, a brief comparison shows how behind we are in this area from a global perspective and the contemporary art scene. The present study seeks to examine how video mapping impacts graphics, identify the relationship between video mapping and environmental graphics, examine the role of environmental graphics in attracting viewers, and examine the aesthetics of digital art. Section two is concerned with the research background, and section three examines research methods. Section four discusses the urban principles and regulations and billboards in the environmental advertisement. Eventually, section five is concerned with the summarization and presentation of the conclusion.

Keywords: Video Mapping; Holography; Holofan; Environmental Graphic; Graphics

1. Introduction

Given the technological advancements in the contemporary modern world and its applications across various fields, it has found its purpose in the arts as well. The power of artistic aesthetics and

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new technologies as a modern tool should inevitably penetrate design, or else we face the risk of falling behind our time. Meanwhile, technology, creativity, and thought must find harmony alongside each other and in line with the science of the day. The creativity of superior technologies is often reflected in various modern and distinct designs in the form of graphics. Superior or advanced technology has grown into an industrial design style that emerged in 1970, merging industry and advanced elements of technology. The development of post-modern ideas thus coincided with the advancement of technical principles. This era is known to have bridged modernism and post-modernism, noting that technology is always serving the idea. Video arts emerged as a new form of art following the emergence of conceptual arts. Video art consists of moving figures with distinct playback and storage features. However, graphic is not a tool and cannot serve various purposes unless it is dominated by the artist. It is the nature of graphics rather than their appearance that serves a purpose and allows the artist to employ it as a means to an end. When creating a work of art, the graphic artist is bound by his message and his means of expression considering the level of his audience, and these boundaries are considered serious obstacles in recording subjectivity and personal experience.

Providing a peaceful and healthy environment for humans has become increasingly vital nowadays, a portion of which is the task of designers seeking to provide an environment ensuring order, logic, and beauty at all times. Environmental graphics encompasses the parts of our surrounding spaces where various forms, figures, colors, and images are presented in a sophisticated, principled, and planned manner to complement and simplify connections and relationships and complete the beauties of the public space. Moreover, the increasing profess of science has led to the emergence of various lighting techniques with unique and distinct features. Three-dimensional lighting systems were first introduced in 2008 using techniques from the various fields of architecture, lighting, music, and animation. These systems enjoy the advantages of an advertisement on building facades which would ensure income and return of capital. The bond between three-dimensional lighting and environmental graphics are known as video mapping in the advertisements across the city has recently blown new life into urban spaces. Video mapping needs to be further and more closely studied and discussed so its other potentials and capabilities can be realized. Therefore, the present study chiefly seeks to investigate the impact of video mapping on environmental graphics focusing on the case of successful video mappings executed in Iran.

2. Statement of Problem

A notable point is that technology is always serving the idea. Video arts emerged as a new form of art following the emergence of conceptual arts. Video art consists of moving figures with distinct playback and storage features. However, graphic is not a tool and cannot serve various purposes unless it is dominated by the artist. It is the nature of graphics rather than their appearance that serves a purpose and allows the artist to employ it as a means to an end. When creating a work of art, the graphic artist is bound by his message and his means of expression considering the level of his audience, and these boundaries are considered serious obstacles in recording subjectivity and personal experience.

Providing a peaceful and healthy environment for humans has become increasingly vital nowadays, a portion of which is the task of designers seeking to provide an environment ensuring order, logic, and beauty at all times. Environmental graphics encompasses the parts of our surrounding spaces, which is an intersection between science and action where various forms, figures, colors, and images are presented in a sophisticated, principled, and planned manner to complement and simplify connections and relationships and complete the beauties of the public

space. Moreover, the increasing profess of science has led to the emergence of various lighting techniques with unique and distinct features. Three-dimensional lighting systems were first introduced in 2008 using techniques from the various fields of architecture, lighting, music, and animation. These systems enjoy the advantages of an advertisement on building facades which would ensure income and return of capital. The bond between three-dimensional lighting and environmental graphics are known as video mapping in the advertisements across the city has recently blown new life into urban spaces. Video mapping needs to be further and more closely studied and discussed so its other potentials and capabilities can be realized. Therefore, the present study chiefly seeks to investigate the impact of video mapping on environmental graphics focusing on the case of successful video mappings executed in Iran.

3. Research Literature

Denis Gaber (1947) was the first to use holography as a means to improve electronic microscopes by regenerating the waves. The holography process evolved until 1950 when electronic engineers and physicists achieved adequate information on this hypothesis in their laboratories. In 1958, Yuri Denisak –a researcher graduate of the Russian Institute of Visual Education- developed wave photography. Amit Leith started his work on fake camera aperture radars in 1953. In 1960, he and his colleague Jerry Apanti started working on a project to enhance the quality of photo waves captured with weak lenses. Their insight into electronic engineering and communication theory was integrated with new lasers to develop high-quality images from 1962 onwards. Their research on building realistic 3D images was concluded by the end of 1963.

In his study entitled "Holographic images and their application in communication science," Mahdinezhad (2010) carried out secondary research to draw a scientific portrait of holographic images (Mahdinejad, 2010). One of the most prominent advantages of holography is that holographic images maintain the properties of the original object and can thus be used to study any desired object without the need to have access to the original object. Moreover, holographic images can make any object more familiar and tangible since they can be created for any real or imaginary object. This is an extremely influential feature in communication science, particularly when it comes to visual communication and the transmission of messages and symbols.

In his book entitled “Environmental graphic arts,” Ostovar (2014) performed a detailed investigation and study of the definition, history, actors, dimensions, application, and tools of environmental graphics (Ostovar, 2014). In another study entitled "An investigation of the features of video art in Iran and across the world," Mohagheghzadeh (2014) investigated the features of this art across the globe and briefly mentioned the characteristics of video art in the USA, Asia, Europe, and Iran (Mohagheqzadeh, 2014). Modarresi (2015) carried out a study entitled "A study of advertisement boards in environmental graphics" concerned with a detailed examination of advertisement, advertisement regulation, environmental graphics, and advertisement pathology in Iran (VameghModarresi, 2015). Turning to studies on features of holographic images, no study in the form of a dissertation has been performed in the country to the best of our knowledge. The available references on holographic images are concerned with how the images are created and their physical features, whereas their visual and practical features in various branches of the communication science require a detailed study of the holographic images examining their unique features to present a visual element based on an understanding on the design, production, print, and display of holographic images.

4. Terminology

4.1. Video Mapping

Video mapping also known as projection mapping or 3D mapping- refers to the techniques of projecting images on objects to create an illusion and trick the audience into thinking that the displayed images are real. This measure may be taken using one or several video projectors (www.behprice.com, 2018).

4.2. Environmental Graphic

This term refers to the visual or graphic perspective of the environment, which is the definition of the phrase "Environmental graphic and graphical environment." Of course, the term "urban design" is also quite close to the environmental graphic in terms of concept so the two terms are sometimes used interchangeably to refer to the same concept (Iloukhani, 2009).

In the process of the creative cognitive act, the individual first becomes aware of some tangible differences and starts to perceive and recall a set of similarities associated with these differences, similarities that cannot be perceived based on the available knowledge and information. Creative work is dependent on a creative mindset more than anything. There is only so much in this world that can be attained through specific techniques and formulas. The clear truth is that creativity and innovation are not among them. Creativity in the environmental graphic is among the influential factors impacting this field of art. Creativity can be defined as the ability to come up with a novel solution to problems or various situations within humane limits and is among the essential capabilities of the human mind that can help develop facilities, solve problems, and rethink one's ideas (Varamini, 2008).

In the 1960s, an electronic engineer named Billy Clover ran the “Afternoon collection: Theatre and Engineering” in the Ninth Regiment Armory in New York. This how led to the establishment of the Experiences in Arts and Technology (EAT) organization managed by Rauschenberg and his engineer colleague, Clover.

However, when recalling this starting point, one would have to keep in mind that those who were present in the shoe remember it not as a technical success, but as a program filled with defects. Moreover, what Rauschenberg and Clover experimented with –such as tennis rackets equipped with radio transmitters- does not appear to have defined the main current of contemporary technological art (Smith, 2003).

4.3. Environmental Advertisement

This is a type of advertisement presented in outdoor environments. Environmental advertisement is among the oldest advertisement methods in which the audience inevitably notices the advertisement since they would have to see it among beautifies of the environment (Arabzadeh, 2016).

The environmental advertisement offers tools capable of passing through the advertisement pass and reaching the target audience, especially in cases where users are on the move and are thus quite receptive to advertising stimulants (Mohammadian and Pourhosseini, 2012).

The history and development of cities suggest that store and business owners have long used advertisement boards –even if quite simple at first- t attract customers, and the boards and panels have become more modern and visually pleasant with the development of the settlements.

Therefore, one could suggest that all cities are similar in terms of advertising signs from various guilds, but vary in terms of the forms and spaces of urban advertising (Gilij, 2013).

4.4. Holography

Holography is among the methods used to create 3D images using lasers, which means that holographic images can be created using the properties of light (Mahdinejad, 2010).

The history of this technological art dates way back. One of the first 3D projections or video mappings recorded in history dates back to 1969 in the opening of the "Haunted House" in Disneyland where busts used to sing. In this video mapping, the heads of the singers were first recorded on 16mm films separately and were then projected on the heads of the busts to create the illusion that the sculptures were signing. From 2004 onward, intelligent video projectors were introduced to the market, resulting in substantial developments in video mapping.

Projection mapping has currently become simpler than ever due to the introduction of various software and video projectors with special video-mapping capabilities. However, the taste of the audience has also become more sophisticated, resulting in a demand for complex and creative video mappings that only specialists in this field can pull off (Biyabani & RoghaniGolpayigani, 2021).

5. Research Methodology

The type of research should first be determined so that the research method can be clarified. Overall, the research methods in behavioral sciences can be classified based on two criteria of research goals and data collection tools. Research is classified into two categories basic and applied research (HafezNia, 2016).

A portion of the present study is carried out through desk research to develop the research background, which will be performed through the review of credible scientific articles, books, websites, dissertations, etc.

The present study also employs field research since it examines various components of environmental graphics ranging from its technical and scientific process to artistic presentation and printed results, which entail the present study going through the inductive research process. Image contents have been investigated from the recording to presentation and each branch has been elaborated on by presenting the application of the images.

Therefore, the present work falls into the category of field research. Secondary references have been used to present a scientific definition of environmental graphics and video mapping. Moreover, analytical methods have also been adopted in the present study to paint a descriptive-analytical picture of the results.

3D mapping is a vessel of a presentation delivered on shapes, which can be performed using several video projectors as well to create motion pictures, animations, textures, and colors in various adverts and even in fashion shows and celebrations to attract an audience and create realistic illusions. The graphic is among the most influential factors in the community whose primary applications include advertisement, message transmission, and audience attraction. The environmental graphic is among the branches of graphics that plays a significant part in message transmission purposes.

Today, techniques such as video art, Holofan, and video mapping can be used to cover all needs in the advertisement, message transmission, promotion of socio-cultural and political knowledge, etc., and establish logical formal relationships and precise organization based on visual principles.

Video mapping (3D lighting) or video projection is a technique through which unconventional surfaces and masses can be turned into video presentation surfaces by projecting 3D images and designs on them, which makes it possible to present distinct visual images on surfaces with a combination of light, sound, film, and animation.

6. Results

6.1. How Video Mapping Work

Video mapping is the result of projector light hitting uneven surfaces such as building facades, models, or products. This specific lighting technique is implemented by projecting a video or image on an object based on its angle and physical complexities (presentation board).

Execution: To develop and execute 3D mapping, the desired surface should first be selected and studied. 3D content or design, media, video duration, color, music, etc. are then decided. The fifth chapter discusses Holofan, a 3D lighting technique, and its impact on society and audience attraction.

6.2. Holofan (A Novel Approach to Environmental Advertisement)

Holofan: Holofan is capable of playing various types of videos in 3D and suspended in the air. An array of 724 LEDs is installed on the blades of a fan creating unique images at the moment by controlling the color of the LEDs. Holofan is a new technology from the 3D Displays family and is among the holographic devices such as Magic Box (holography box) and Stage Magic (holography stage), with the only structural distinction that both electronic and mechanic engineering and 3D imaging have been used in holofan. Holofan is extremely visually appealing but has its specific limitations and quality.

Holofan can display various types of videos in 3D and suspended in the air which is extremely appealing and attractive. Larger animations and images can be displayed by putting several holofans together. This technology can be a new generation of environmental advertisement and has undertaken significant growth across the world over the past few years.

This device is an essential component of environmental advertisement in society. Holofan has been produced in China and England and is used by large companies such as Benz and Audi in their advertisement. Holofan can form direct bonds with various social classes, create the illusion of real images to attract an audience, and make the audience feel like they have teleported to another space. Holofan is a new art with a novel approach to an environmental advertisement that can replace old advertisement techniques and usher in a new age of novel arts.

Table 1 Complementary explanation of the software used in video mapping (author)

DIGITAL PAINTING	Digital painting
PHOTOSHOP INDESIGN MISCHIEF SKETCHBOOK KRITA GIMP 3D MAX BLENDER MAYA CINEMA4D	Software used by designers to design illustrations, perform imaging and simulation and create animations, fashion art, and modeling and 3D editing software used in industrial design, movies, and motion graphics used to edit real images and create 3D games or edit movies.

LUMION CELACTION2D TOON BOOM HARMONY MOHO (ANIME STUDIO) DIGITAL FASHION ILLUSTRATION LIGHTROOM PREMIERE MARVELOUS DESIGNER GEMINI GERBER LECTRA OPTITEX CAD PATTERN DESIGN PATTERNMAKER MARKER STUDIO DC SUITE COREL DRAW FASHION SOFT DÉCOR CAD PRO SLID WORKS SKETCH UP PRO 100 3D SKETCH LIST	New researchers can use them in new designs and display multiple works together. Software used in interior design, furniture and decoration design, material display, lighting, and simulated images
STEREOLITHOGRAPHY is based on a light-sensitive monomer resin used in Precipitator modeling, digital light processing, and 3D printers used in dentist offices.	
RHINO REVIT	This two software are used in industrial, structural, and architectural design on modeling, production, and graphic multimedia

6.3. Response to the Research Questions

Question 1: How has video mapping art influenced environmental graphics?

Answer: The bond between art and technology is a mixture of light ad images presenting unconventional masses and surfaces as 3D illustrations.

Question 2: How does 3D art relate to the real world, and how does the audience react to it?

Answer: 3D art creates a three-dimensional and interactive demonstration of the real world for the audience, which is a combination of illusion and reality.

Question 3: How can environmental graphics be used in an advertisement?

Answer: Environmental graphics can be used to simplify, connect, transmit messages, perceived the environment, and promote visual identity in the advertisement.

Question 4: Which branches and forms of advertisement are more successful?

Answer: The art of holofan with 3D technology can most effectively attract the audience through environmental advertisement and establish a more attractive and better connection to the audience through 3D images.

7. Recommendation

This software can be used to create attractive and unique designs resulting in spectacular works of art, and researchers can employ them as individuals or together to develop new techniques. Moreover, researchers can take advantage of these software to create graphic works, holofan, and video mapping and leave impactful works behind.

As mentioned in the previous chapter, various factors such as conflict, proportion, balance, light, color, texture, resizing, unity, diversity, continuity, repetition, and escalation are involved in environmental graphics. Future researchers can take advantage of the new holofan art technology alongside diverse colors, textures, lights, music, and videos to present new and innovative works.

8. Conclusion

As mentioned earlier, holofan is a new environmental graphic technology that could usher in new approaches to the environmental advertisement. This technology can also play a prominent part in society when it comes to advertisement and connecting with people from various social classes. The impact of fast transmission, beauty, and creativity in art alongside music can give the audience a new sense of environmental advertisement in the contemporary era. New technologies of the new age make it possible to establish a better connection and create a more pleasant space to express emotions, transmit messages, and attract audiences.

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