

The impact of the technological advancement on developing the aesthetic form of Architectural facades

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Introduction:

Historically, the mural sculpture art was closely related to architecture. It was related to the historic events or religious positions attached to the faiths of people and places of worship such as temples, cemeteries and palaces at the ancient civilizations. For those reasons, the mural works were not separated from architecture across the various civilizations and ages. However, the relation between mural sculpture and architecture has taken multiple forms, of which each one had a special technique.

Then, the Industrial Revolution emerged leading to a radical change in production techniques; hence, the relation between mural sculpture and architectural facades have different forms and styles. This research paper addresses a study for the impact of materials and modern techniques on developing the relation between mural sculpture and architectural facades.

Research Problem:

How to use the materials and modern techniques on developing the aesthetic shape of the mural sculpture in architectural facades?

Research Importance:

1. Highlighting the artistic richness in the relation between mural sculpture and architecture arts.
2. Shedding light on the technology role on developing aesthetic shape of the mural sculpture in architectural facades.

Research Objectives:

1. Knowing some materials and contemporary plastic art techniques in the mural sculpture and architecture arts.
2. Knowing the materials role and contemporary techniques on developing the relation between mural sculpture and architectural facades.

Research Hypothesis:

The researcher assumes that we can reach to multiple patterns on developing the aesthetic shape of mural sculpture in architectural facades through using modern techniques and materials.

Research Methodology:

The research is following the steps of analytic-descriptive approach.

Research Scope:

This research is shown some contemporary architectural models from the (20th and 21th centuries) that had reflected the materials role and modern techniques on developing the aesthetic shape of the mural sculpture in architectural facades.

1. A Historic Brief about the Relation between the Mural Sculpture and Architecture Arts:

Historically, the sculpture mural art was closely related to the architectural creation. It has a great impact in enriching the architectural facades and expressing the identity of places and bringing various civilizations and cultures through sunk - relief and bas-relief. As it was related to the historic events or religious positions that were very attached to faiths of people and places of worship such as temples, cemeteries, palaces at the ancient civilizations. If we take a deeper look at the relation that connected the mural sculpture and architecture through history, we will find that there is a direct relationship. This means that we will find ourselves in front of a unified one body, at those periods the mural sculpture and architecture were flourished in all aspects. The sculpture art was remained until the end of 19th century as a handicraft that mainly depended on the handy skill of sculptors.

2. Impacts of Technological Advancement on the Relation between the Mural Sculpture to Architectural Facades:

At the time of scientific and technological advancement which had prevailed during the Twentieth Century, and the strong domination of new thoughts in the field of techniques, industry and molding materials. The sculptor should to be up to date with the new patterns and techniques which helped him to produce innovative formulations and structures. The technology becomes an innovative tool and not a method or an operational tool only, so there are many artists with different experiences in the mural sculpture area by using unconventional materials and techniques. The technological advancement had impacted on materials and techniques.

First: Impact of Modern Mural Sculpture on Developing the Architectural Facades

The emergence of many new substances and materials highly impact on developing and changing the relation between the mural sculpture and architectural facades. As we can find that the materials have a great impact on the relation between the mural sculpture and architecture, some materials are helped to create a coherence and cohesion between the mural sculpture and architecture through multiple new forms by using modern techniques, including the following materials:

A. Reinforced concrete:

The reinforced concrete is considered one of the most important beams in the modern architecture as it has contributed by its structural and applied features which reflected on the relation between the mural sculpture and architecture (. As in image (1)



Image (1) A Mural Sculpture Using Reinforced Concrete on the Facade of Churchill Square Shopping Centre - England –1969

B. Bronze:

The bronze material has used significantly in the mural sculpture area, at the time of technological advancement the artist was benefited from the chemical advance in treating the outer surface of bronze material and do periodic renovation so as not to affect the mural work with weather factors. As in image (2)



Image (2) A Mural Sculpture made of Bronze on the Facade of Fashion House Building - Minsk City - Belarus -1967

C. Polyester:

The polyester was one of materials that appeared dramatically during the Twentieth Century due to the operating ease, weather-resistant, polish able material and levity characteristics. It provides the artist with the transporting ease, installation and fixation for his artistic work. As in image (3)



Image (3) A Mural Sculpture made of Polyester on the Facade of Liverpool Metropolitan Cathedral House - England- 1967

D. Glass:

With the appearance of the modern architecture in the Twentieth Century the glass was changed from its supplementary function related to architecture until it became a substance in the main architecture materials. The hollow glass walls and glass bricks were replaced the solid walls. We could find that the using of glass in architecture area, specially using it as an entire facade had effected on the relation between the mural sculpture and architecture. As it was impossible fixing the mural sculpture on glass. Therefore, a new shape of mural sculpture had appeared and turned to a mural formation by using glass on the architectural facades. As in image (4)



Image (4) Prominent Formation from Glass Beijing Tower - Greenland – China – 2016

E. Cladding Materials:

Many new, unconventional and manufactured materials had appeared, were used significantly in the modern architecture. Obviously, those materials were impacted on the mural sculpture of the architectural facades. So it was appeared in new and various shapes different from the conventional shape. The most popular materials are (Titanium - Plastic - Aluminum -Stainless Steel - Reinforced Glass). As in image (5)



Image (5) A Mural Sculpture made of Stainless Steel on the Facade of Rockefeller Plaza Building - New York City – 1940

Second: Impact of Modern Mural Sculpture Techniques on Developing the Architectural Facades:

The digital Medias appeared at fifties of last century, it brought the simple artistic ideas and publications. Then exceeded that to think for a while that the digital media was in every details of our lives, and it had effected on all fields especially architecture. It brought and merged the videos works and installation art, moreover the photographs which were processed by computers and printed with large sizes to be used as entire murals in public places.

Whereas the digital media that appeared at the production of many works, had a significant role in enriching the modern architecture. Those modern techniques have changed the conventional concept of architectural facades of visual image, consequently the general shape of building. Therefore, the concept and relation between the mural sculpture and architectural facades had changed. The mural formation becomes an integral part of architectural facade in many modern building. One of the most important modern techniques that boosted the relation between the mural formation and architecture:

A. Optical Techniques:

The optical techniques are considered a part of digital Medias that have used in architectural facades. The architectural facade of building is covered by a number of glass discs, by using the computer's program we can control in lighting each disc. The architectural facade will turn to an interactive dynamic facade. As in image (6)



Image (6) a Prominent Formation of Aluminum Layers – The Architectural Facade of Rundle Lantern Building - Australia – 2008

B. Multimedia Techniques:

The main aim of these techniques is to break the ice between the art and street audience who see the artistic work and interactive with it, whatever they can or cannot understand and recognize its aesthetics. Adding to the role of digital technology in giving these changeable motion pictures which are full of colors, sounds and lights. The interaction of passers-by is considered the real adding of creativity in art and architecture fields. As in image (7)



Image (7) Using Interactive Techniques in An Artistic Work - Australia - 2009

C. Motion Technique:

The motion technique is used in many contemporary buildings; there are several ways to create motion in architecture; as it can be physical or active motion. The physical motion has used in a number of contemporary architectural works, as we can make it by forming the architectural facade of building as we can imagine the building is moving. As in image (8)



Image (8) Motion in Parking Garage Building – Sydney – Australia – 2014

D. Interactive Techniques:

The interactive techniques are systems that make the architectural work reacts and interact with the user's requirements in an automatic or spontaneous way. There is a change in the exterior surface of building like changing facade look or changing it for an interacting advertising facade according to the user's requirements. As in image (9)



Image (9) the Interacting Motion in the Facade of Russian Telecommunications Company - Megafon - 2014

E. Virtual Reality Techniques:

The architects take advantage of digital technology trend in architecture, as they build facilities by using the graph basis that based on many assumptions. It means that this technique leading to the virtual architecture, in which the physical barriers of computer screen outputs fall. Presenting a virtual and imaginative world and by its visual and unlimited virtual potential. As in image (10)



Image (10) The Mural Formations Using Virtual Reality Technique on the facade of The Panorama Music Festival in New York City - 2016

3. Forms of Mural Sculpture Relation to Modern Architecture:

The relation of the mural sculpture and architecture has many forms, as most of mural sculpture works depend on mixing with the architecture. Consequently, it requires a full aware and understands from both sculptor and architect alike. In order to produce a work that will add to them and achieve a distinctive aesthetic vision. The mural sculptures of modern architectural facades have many forms that can be summarized as follows:

a) Mural Sculpture within a specific framework of Architectural Facade:

It is the simplest form of formation forms that bring together the mural sculpture and architecture. In this form we consider the wall as just a ground which the sculpted work is fixed on it. Only the artist specifies an appropriate space for his work. The cons of this way that it is separated between the formation parts "The sculpture and architecture", and each one is away from the other.

b) Mural Sculpture in the form of Separate Paintings on the Architectural Facade:

In this formation the artist distributes his work on the entire spaces of wall and should therefore be a relation that related between those paintings either this relation will be the topic through unifying it between those scattered paintings on the wall, or this relation will be a plastic art.

c) Mural Sculpture is overlapped "Without Ground" with the Architectural Facade:

In this formation the artist confirms the coherence between the mural sculpture and architectural facade through cancels the ground of mural sculpture, as the ground of its shapes is the wall surface itself to be one physical body.

d) Mural Sculpture that covers the whole area of Architectural Facade:

In those works, the artist cancels the abstract presence of wall. In other words, the mural painting covers the entire area of wall so it sounds like the painting is the wall itself.

e) Mural Sculpture is unified with the Architectural Facade:

In this case, the architectural facade and mural painting are considered as one unified body. It means that the mural work is made of the same material of architectural facade. This formation is considered the strongest merging forms of sculpture with architecture, as both of them are within one physical body.

f) Prefabricated Mural Sculpture:

The sculptor sculpts his work on the architectural facade by installing it on the wall as he deems it appropriate. The artist depends on the full prepared substances or parts of it, then he collects it together to create a connected or separated mural.

g) Mural Sculpture on a Mass in the Space:

This type of formation is entirely new; it is one of the Twentieth Century trends. It changes the conventional form and concept of mural sculpture that we know in the previous ages. In this type the mural work is sculpted or collected to form a free space on the architectural facade.

Results:

1. The age of the machine influenced the emergence of absolute abstract thought.
2. Dramatically, the impact of technological development on the relation between the mural sculpture and architecture in an expected way. This development changes the relation between them, reformulating and forming its determinants to cope with this new digital age.
3. As a result of technological development and industrial revolutions and informatics two directions, the trend of employing materials and modern techniques in strengthening the relationship between mural sculpture and architectural facades with new methods and visions and another trend approached by many architects towards stripping architectural facades of decoration and attention with modern construction technology.
4. The architectural facades have been transformed into covers covering the buildings, and its entity the mural formations have become an integral in new expressive dimensions.
5. Some new techniques are helped to open new horizons of creation, to meet with mural formations of architectural facades that are impacted and influenced by it.

Recommendations:

1. Highlighting the importance of strengthening the relationship between mural sculpture and architectural facades.
2. Emphasis on the role of mural sculpture art in creating a new plastic art language that addressing the new culture and reflecting the age requirements. Through contributing on developing the artistic sense levels of creations that depend on the modern technology media.
3. Make future research and studies on the development of the aesthetic dorm of the architectural facades through mural sculpture.
4. Necessity of benefit from modern materials and techniques in creating new patterns in the relation between the mural sculpture and architectural facades.

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