

## **The third dimension of Mural glass between the creativity and application of internal architecture**

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### **Synopsis:**

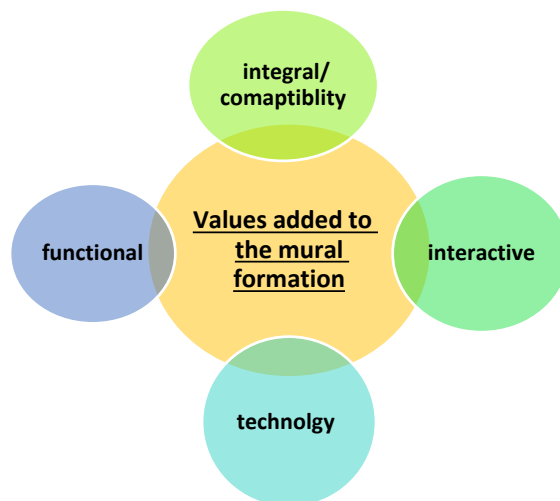
In the beginning of the twentieth century, the architecture and the associated arts have played a major role to create and develop appropriate solutions to the aesthetic and functional requirements in the modern era. There were methods in the implementation of murals characterized by formal and useful beauty, it was branded with the third dimension that highlights the work and emphasizes its technical value. Various types of glass have manufactured in different distinguished specifications and countless colors. Meanwhile, these types of glass were described with high degree of tolerance to climate factors and surrounding environment. In addition to the diversity of the textures which fetched from its usage has been enriched the surfaces with beautiful and artistic values.

### **Means of architectural design of glass walls**

The wall or the surface is having the primary architectural design effect on the receiver. It consists of vertical and horizontal design parameters such as walls, ceilings and floors. The surfaces have a direct effect on the receiver because they are most obvious and clear things to humans. Touch and color are the utmost visible means of surface design. The composition of the walls is determined by the shape, space, light, color and texture that are combined together among the architectural formation.

### **Values added to the mural formation:**

The wall is the cover for the architectural space; it gives the sense of closure or extension and the form of the wall and its degree of transparency, are distinguishing the relationship between interior and exterior. Furthermore, mural designation is gaining more values because each time we add values to the mural formation it becomes more beneficial, attractive and elevating the artistic principles which increasing the enjoyment of the addressee. The mural has been moved from art of work pertaining to wall to transforming the entire wall to an artistic piece integral to the architectural form that achieves complementarity in the space. The mural design concept has moved from the aesthetic, expressive and picturesque aspects to a more comprehensive vision that carry extra aesthetic and functional aspects.



**a- Integral value to the mural formation:**

When the designer introduces the design mechanisms and sets the tools necessary to connect users to their purposes. The design focus here is to create an environmentally and functionally compatible building with the needs of the building's users. This creates a dialectic that the building is functional and environmentally integrated to serve the user. Therefore, the construction system must comply with the optimum use of architectural spaces to be designed. Structural selection with architectural purpose to complete the creative idea. The complementarity is ensured through the formation and color: it shows the integration and compatibility between the furniture and the composition of the wall through the form of units and color



**b- Functional value:**

The obvious structural benefit of the wall can be transformed into aesthetic functional elements, starting with the design ideas, taking advantage of structural and architectural elements away from traditional and typical solutions, and producing more agile elements in changing external visual qualities. The structure can also play a role sometimes on the cladding of the building or interfere with it, there are functional requirements include:

- Achieving the basic function of matching between the part, the whole, the whole and the public.
- The efficiency of the materials for the performance of the job
- The security and safety of the motor performance
- Subjecting the dimensions of the vacuum to the dimensions of human need
- The compatibility between the method of use and the type of user.



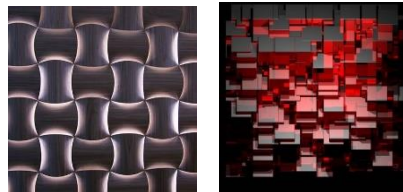
**Mural as sets**



**Mural as intertainment**



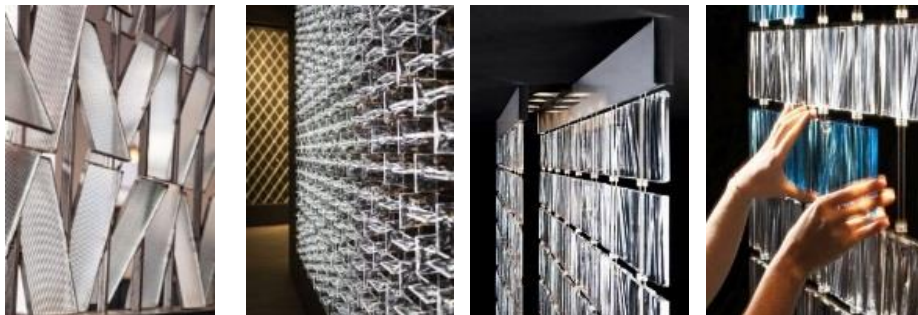
**Mural as shelves**



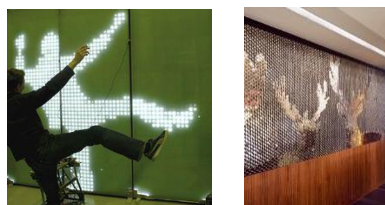
**Mural as lighting**

**c- interactive in the mural:**

In the last two decades, interest has increased in interactive thinking. This means that the thought gives the recipient a greater role in the design process and transforms it from scenes of artistic work to an active participant, making his enjoyment part of the creative process. The interactive formation started through the movements, opening and closing of the forming units installed through a metal frame as a shape



Digital technology has unleashed the mural to handle digital media and software, leading to the emergence of interactive murals.



**d-Technical/Technology value in the mural:**

Among the most important values that achieve the theory of beauty in design is the technical value, which takes the approach of creativity and innovation in achieving the goals of aesthetic and functional design, based on the latest technical developments, including the new materials and tools and methods of production The glass murals appeared new formations to speak a boom in the technical world

## Design methods and wall formation:

There have been many and varied methods of wall-forming, including painting to:

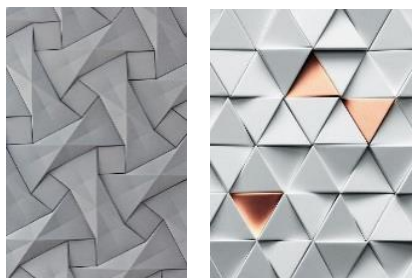
### 1. Achievement of the third dimension of painting:

Linear and chromatic rendering increases or decreases the sense of blocks and shapes. Realization is achieved by dividing the spaces. The line becomes an effective effect in achieving the dimension, as well as the contrast and color gradation. The surfaces are emphasized. With the distribution of shadows, the dimension is emphasized in the design.



### 2 - form the third dimension in the way the transition levels (the formation through the pattern (tile)

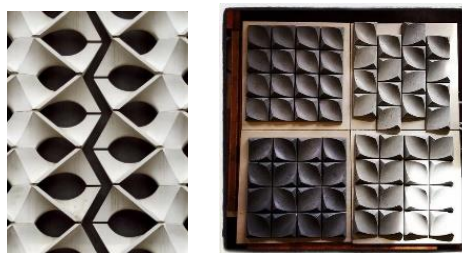
It is common and diffuse through the different designs of the unit and therefore when assembled, the final form varies from design to design



### 3 - Achieving the third dimension through **stability with differ position** (which affects the difference in the values of plastic and shadow)



### 4 - Achieving the third dimension through the stability of the unit with the bending process of the single (mutated) one:



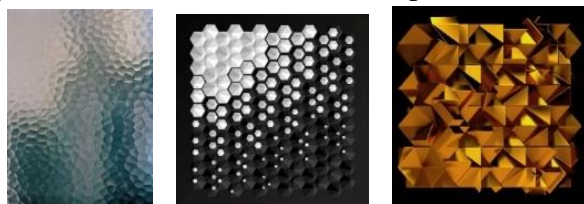
Hence, it is clear that the plastic values differ according to the conditions of the plastic unit, in which the silhouette and photovoltaic values are achieved, and to achieve that effect in the glass



### 5 - Achieve the third dimension through the angle of moving the pattern with the processes of repetition and scale

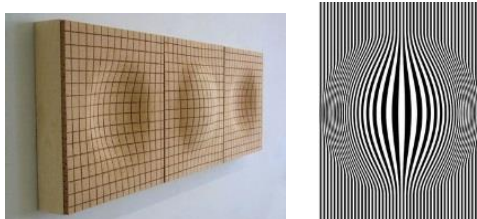
Through the movement of the pattern and its different directions with the movement of the unit, whether the animation in the design or through the unit after the installation as mentioned in the interactive values and with the frequency and scale of the size of the shape of the tile vary methods of the formation of murals

Methods of the formation of murals vary through the movement of the pattern and its different directions, the frequency and scale of the size of the shape of the tile



### 6. Achievement of the third dimension through convexity and concavity (optical art):

The third dimension can also be traced through the art of optical art. Through the convex and concave processes of forms.



### Design solution to glass murals:

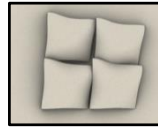
The research axes focused on how to activate the third dimension in the murals by using or benefiting from the various artistic trends such as Optical art and Origami. The design ideas came to address the most important foundations on which these trends were based.

The ideas of the initial design on the construction flat surfaces of equal thickness, and out of the level and with the continuation of lifting and out of the level to turn the surface into tow dimension to semi three dimensions. Then the ideas moved to the construction with lines to become more complex to create columns or segments

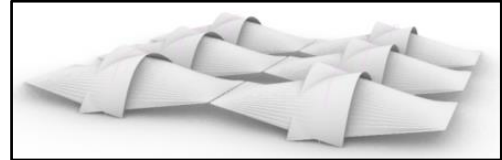
**First trend: formation of tiles:**

Design depend on the repetition of pattern to achieve semi 3d

Traditional pattern

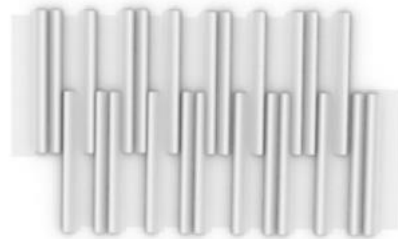
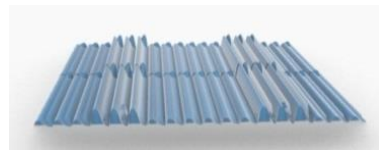
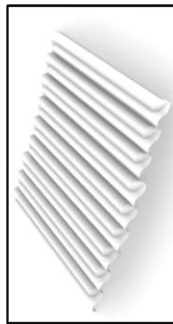


Untraditional pattern

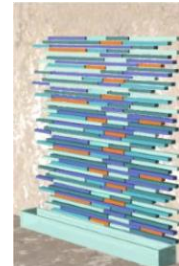
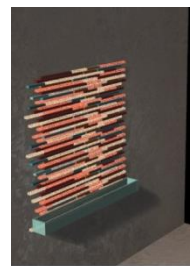


**Second trend: forming from column:**

The composition varies according to the thickness of the column, the shape of its section, its length and its context in the formation, whether in horizontal or vertical position.



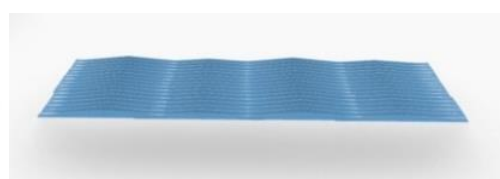
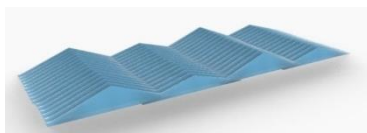
Formation through columns of fixed length and varying thickness  
forming from cloumn of varying length & similar thickness



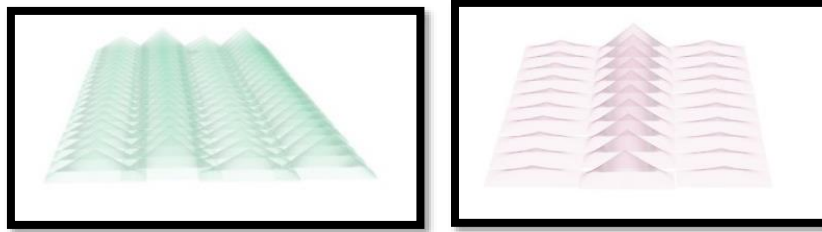
**Third trend: formation of slides:**

The formation of the slides varies from formation of the columns and the formation of the tiles. It gives the sense of three-dimensional through the difference in slide's shape and thickness and the different dimensions; which gives the slide's design a wide range of the configuration where can be formed by thermal bending or cold forming, and it is characterized by ease of installation, configuration and the exposure of glass to stress.

- Formation of slides through series (similarity of appearance and measurement) and formed by the formation of cold (assemblies).

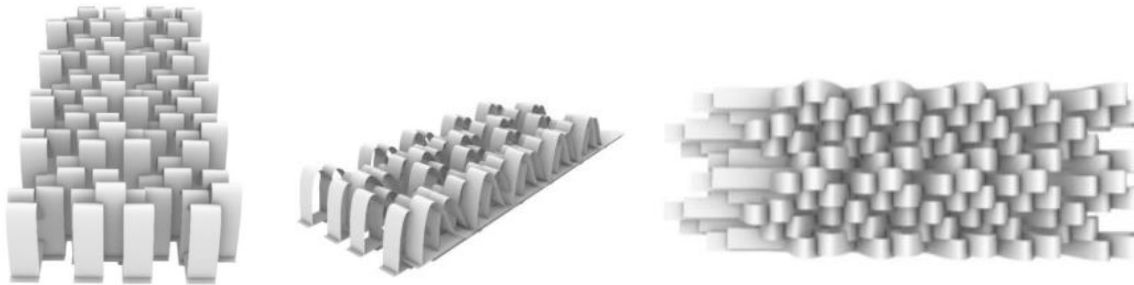


- Formation of glass slides through serial surfaces of graduated measurement with the repetition of the appearance and form by the cold (assemblies).

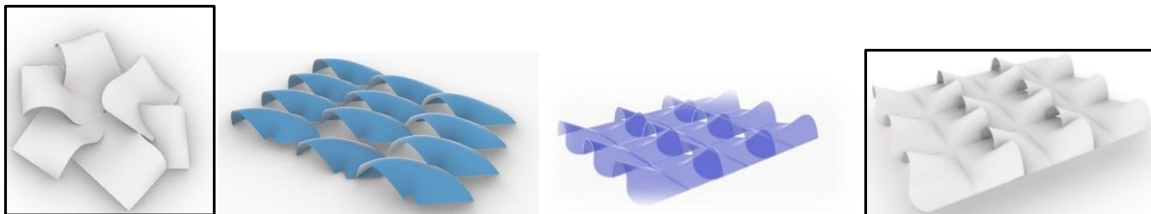


### - Formation through single-bending slats

The slides can be produced by thermal bending and assembled on a glass plate by UV adhesive. The effect of diversity in the structural system of repetition and regular gradation leads to variation in the resulting bodies. The difference between the surfaces (slides or columns) different effects.



- **The formation of the segments through the synergy** (where the combination gives different aesthetic values and can achieve the third dimension in many ways where after the distance of proximity or longitudinal or circular combination of each form gives a different sense.



### Results:

The research and the design ideas come out with facts that the three-dimensional murals designs are:

- 1 - Transition from the two-dimensional to three-dimensional lifting and exiting this level and achieve values and variety of spatial as attained in the art of origami.
- 2 - The glass tile is one of the most popular trends in architectural design, but the research studied it from the visual sense influenced by the art of visual deception and profound sense, to get along with the modern design trends towards the embodiment.
- 3 - The emergence of a new trend of the three-dimensional wall layout using the lines (columns or slides) to combine the function with the architectural mural as a part of it by controlling the lifting levels and out of the level to interact with the user and meet the design's target.

4 - The formation of the wall with consecutive serial surfaces (slides), meet the highest value of the three dimensions of the mural. Nevertheless, in cause of the glass material nature the cold/regular formation achieves the highest efficiency in the formation with the possibility of application due to its subject to modern modeling processes, which is based on the design and all phases of its formation and operation until it reaches the implementation phase preserving the user's safety.

5 - The third dimension in the murals gives benefits (value added) such as integration, functional and interactive.

### Recommendations:

- 1 - Expansion of governmental and private engineering institutions and offices in studying the advanced and modern technologies for glass walls and identifying what is new to achieve the aesthetic and functional values of interior architecture.

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