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Visual Thinking and Islamic Architecture

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Abstract:

One look to the surrounding environment, and its visual elements, is sufficient to make the architectural designer, particularly, interested in it. The visual elements of the environment are considered as creative motivators for the designer, developing his visual skills, and his related visual thinking processes, as well as its impact on the designer's visualization, to be capable of creating rich and authentic designs. Through a set of mental processes mainly associated with the skills of visual thinking, as well as the personal emotions related to each designer, which have an important role in honing the different designer's skills.

The Islamic architecture and its sculptural architectural elements reflect the designer's artistic skills, his ability of observation, and visual perception, which contributed greatly to the expansion of his visual thinking skills. These can be discerned through reflections of the surrounding environment in his architectural elements designs. By contemplating the natural elements of his surrounding environment, the artist has been able to create innovative aesthetic designs for his creative sculptural architecture that carries the Islamic vocabularies and spirit.

This paper aims to discuss the important role of visual thinking in developing the architectural sculpture designer's creativity processes, through studying the architectural elements of Islamic Architecture. As well as investigating how contemplating surrounding environment inspired the artist with all its details, and how he/she treated it as visual and emotional stimulation, that fire up his/her imagination, enrich his/her thoughts, and make them able to reframe it in new original designs that reflect all the holy spirit of Islam.

Key Words:

Environment؛ Visual thinking؛ Emotions؛ Symbolism.

ملخص:

إن نظرة واحدة للبيئة المحيطة بنا، وما تضمه من عناصر بصرية، كافية لجعل مصمم النحت المعماري يوليها اهتماما خاصا، حيث تعتبر عناصر البيئة البصرية من محفزات الإبداع لدى المصمم، والذي يستطيع تنميته من خلال تنمية مهارات الرؤية لديه، وكذلك عمليات التفكير البصري المرتبطة بها، وما تعكسه من تأثير فعال على خيال المصمم، ليصبح في النهاية قادرا على إبداع تصميمات غنية وأصيلة، من خلال مجموعة من العمليات العقلية المرتبطة بشكل اساسي بمهارات التفكير البصري، وكذلك الانفعالات الشخصية المتعلقة بكل مصمم، والتي لها في حد ذاتها دورا هاما في صقل مهارات المصمم المختلفة.

تمثل العمارة الإسلامية، وما تضمه من عناصر نحتية معمارية، انعكاسا واضحا لمهارة الفنان المسلم، وقدرته على تأمل البيئة المحيطة، سواء كانت طبيعية، أو معمارية، وانعكاس ذلك على ما لديه من مهارات الإدراك البصري، مما ساهم بشكل كبير في تنمية مهاراته المتعلقة بالتفكير البصري، وهو ما تمثل بوضوح في تأثيره ببيئته المحيطة، و عمارة الحضارات السابقة، في تصميم هذه العناصر المعمارية النحتية، حيث استطاع من خلاله تأمله لعناصر بيئته الطبيعية، استلهام تصميمات جمالية مبتكرة مميزة لعماراته النحتية المبدعة، تحمل بين طياتها مفردات الإسلام، وروحانياته .

إن هذا البحث يناقش الدور الهام الذى يلعبه التفكير البصرى، والعمليات العقلية المتعلقة به، فى تنمية العمليات الإبداعية لدى مصمم النحت المعماري، وذلك من خلال دراسة العناصر النحتية المعمارية فى العمارة الإسلامية، وكيفية استلهاهم الفنان المسلم لها، عن طريق تأمل بيئته المحيطة بكل تفاصيلها، والتعامل معها بصفقتها مثيرات بصرية، وانفعالية، تحفز خياله، وتثرى أفكاره، وترتقى به، وتجعله أكثر نضوجا من الناحية التصميمية، لتفتح له بذلك مجالا واسعا يساعده فى النهائية على إعادة صياغة هذه العناصر فى تصميمات نحتية معمارية أصيلة.

الكلمات المفتاحية:

البيئة؛ التفكير البصري؛ العواطف؛ رمزية

Introduction:

The greatness of each civilization can be apprehended from the greatness of its architecture. Only one look at Islamic architecture is enough to tell how great this civilization was, and how deeply the Muslim designer loved his environment. The Islamic architecture can be considered as a mirror reflecting its environment, and emphasizing the Muslim designer's close connection to it. This connection enhanced the designer's ability to observe every little detail of the surrounding environment and buildings, and transform it into a well-designed architectural sculptural element.

The capability of the architectural sculptor depends on his ability to understand his surrounding environment and observe the potentialities of its visual elements. His vision, and his intimacy to his environment constitute the first steps to obtain the "visual thinking" skills, and the mental processes associated with them, helping to develop the designer's creativity.

The "visual thinking" is a series of processes starts with the eye movement itself, and ends with a creative outcome as a result of brain analysis of the visual information combined with cultural features stored in the designer's brain. This outcome can simply be a rich and original architectural element of design, which acts as visual stimulus to the receiver, who starts a whole new visual thinking process.

The "visual thinking" processes help to develop the designer's recognition of the visual language surrounding him, and understanding its details, then expressing this knowledge with his style in exquisite visual sentences, in the context of the architectural design. These unique architectural designs involve the visual reader with the original Muslim visual story, and help him to develop his own visual thinking skills too.

Problem statement:

- How can the study of "visual thinking" enhance the architectural sculptural designer's creativity skills?
- How did "visual thinking" play a major role in developing the Islamic architecture?

Assumptions:

- The skills of architectural sculptural designer can be developed by studying the visual thinking processes.
- Absence of "the visual thinking processes" from the curriculum associated with architectural design teaching.

Aims:

- Attempt to design architectural sculpture that is compatible with the surrounding environment.
- Eliminate the visual chaos in the new cities architecture.

Literature review

Visual language is the highest level of all languages, because its reading is associated with complex mental and emotional processes. Visual language is full of visual vocabulary and symbols that reflect many concepts. The comprehension and respond to these symbols represent the designer's ability to read them. Visual language is the main link between the designer and his surrounding environment. This environment represents the first source of visual knowledge that the designer can read and understand its vocabulary through pure observation. The environment is full of visual stimuli that stimulate the designer's creativity by emphasizing the aesthetics of nature.

The reading of visual sentences begins primarily through the process of seeing that the eye of the designer does, where the eye represents the designer's own portal to the visual world around him. This visual information received by the designer's eye is combined with feelings and emotions that determine the extent to which the designer is related to and attached to this knowledge. Eventually, this information reaches the designer's mind, which in turn analyzes and preserves it. These processes, which are related to the visual language and the knowledge provided by it, are the first stage of "**the visual thinking**".

Visual thinking:

Visual thinking is a way in which the designer can communicate visually with his environment and combine its visual elements with the information and knowledge stored in his mind. The aim is to re-coordinate images of different meanings in one meaningful context. All this process starts with the designer's vision of the surrounding environment and his desire to find visual solutions to his design problems. That's why this talking about the visual thinking should start by discussing the definition of "**the vision**".

The vision:

Vision is the starting point of an exploration journey, where the designer, relying on creativity and innovation, begins, to establish his own visual library that is full of visual elements of his environment. The environment is a comprehensive visual encyclopedia that includes an infinite number of visual vocabularies. The designer's ability to read these vocabularies means the development of his mental skills. So Whenever the designer is exposed to these visual vocabularies, his visual expertise increases and becomes more attentive to the elements of his surrounding environment, and becomes also more responsive to these vocabularies as visual stimuli, thus becoming more visually conscious.

Vision also plays an important role in developing the designer's imagination and visualization. It helps him to develop his ability to think visually and to be more creative and innovative. Imagination is the main catalyst for the development of visual thinking, and it's also a process of higher mental and intellectual activity related to the visual perception of the designer. Imagination also considers the reflective image that is formed in the mind of the designer as an extension of those views that he sees around him and it is a part of the experience that the designer gain when he perceives visuals. (Diwan and Alkanany 2012, 580)

The visionary exercise works mainly to enrich the designer's visual thinking and to regulate the mental processes associated with it. This helps the designer to manage linking his previous experiences with the requirements of the new situation. As a result, the mind of the designer will be able to organize his visual knowledge and experiences in creative imaginative forms. (Ware, visual thinking for design 2008, 3) These forms are mainly related to the **visual queries** needed to solve the designer's visual problems. These visual queries and the visual search related to them are the new start for new group of visual and Sentimental processes.

Visual queries and visual search:

Visual queries are the most important approach that helps the designer to perceive the visual elements. The designer sees what he needs to see, that's why his mind constructs a set of visual queries according to the design's problem and starts a visual search to satisfy these queries (Ware, visual queries:the foundation of visual thinking 2005, 28). The visual search is executed mainly when the information that the designer needs to solve the problem or to create the design is so little. So we can say that the visual queries and the visual search are very basic processes related to the visual thinking definition. (Verstegen 2005, 41)

Mental processes linked to the visual thinking:

There are many complex mental processes associated with the concept of visual thinking, but the most related processes to the designer are:

Bottom-up process:

This process begins mainly with the eye's reception of the visual information. This information travels through the nervous system to the brain which combines it with the knowledge he already has.

The designer's understanding of this process helps him to learn how to organize different visual elements in different spaces. At the top level of hierarchy, the information is processed into several features, and distilled through a pattern. These patterns are converted later into innovative visual designs.



Figure. (1): bottom-up process. (Ware, visual thinking for design 2008, 12)

Top-down process:

This kind of mental operation is used when the designer needs to achieve a specific design goal or solve a specific design problem. This process is primarily based on the interconnection of visual and non-visual knowledge to produce an innovative design. (Ware, visual thinking for design 2008, 13, Al hashemy 1984)

Nested loops process:

It is a way describes how the designer's brain operates to solve the design problems through a set of nested loops. The outer loop deals with the generalities. Inner loop deals with details. In the outer loop the brain constructs a set of steps to solve the problem and then execute them. In the middle loop the visual search is executed to help the designer to answer the visual queries

by finding a pattern. Finally, the inner loop is activated when the eye finds something needs to be processed to solve the problem. Figure (2). (Ware, visual thinking for design 2008, 18)

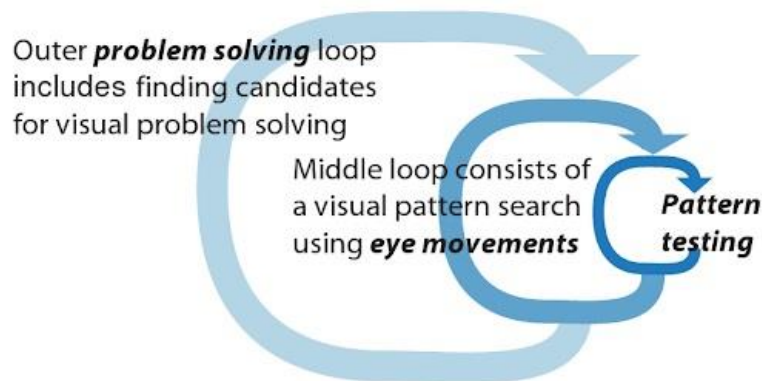


Figure (2): the nested loops (Ware, visual thinking for design 2008, 18)

These processes illustrate how the designer's mind handles the visual information and use them to solve design problems. There is also the emotional approach, which expresses the strong link between the designer and the environment, the interaction between them, and the designer's feelings to its elements. This approach affects the designer's way of forming the design through visual thinking vocabulary.

Emotions and the visual thinking:

The emotion is one of the fundamental determinants of the designer's visual thinking. Emotion is an important part of developing the designer's thinking through its role in building his personality, developing his mental and intellectual intelligence, and refining his behavior and feelings. The designer's emotions and feelings towards the visual elements directly affect his ability to read these elements and recreate them visually in a way that reflects his feelings (Al hashemy 1984, 182). The emotions are reflected automatically in the designer's designs because they have the ability to link between themselves and the recipient through his life and environment.

Symbolism and visual thinking:

The symbolism of the visual element is a fundamental part of visual thinking processes. The symbolism gives the designer the ability to express the visual element in a simple way that reflects its meanings. Symbols are means of understanding and creating relationships between what they exist within the designer and what is around him (A.elhamid 2007, 320). The designer himself is one of the symbols makers and the symbol itself is considered one of the creative design basics.

Visual thinking is a system of concepts, knowledge and associated mental processes that help the designer to develop his personal and design skills so that he reaches the top level of design, especially for architecture and the aesthetic details related to it. The architecture is one of the most important visual arts that help the people to communicate with their environment. It is a life reflection of what we love, and what we belong to, so it must be a result of sincere visual thinking processes done by the designer.

Visual thinking and architecture designer:

Visual thinking is one of the important skills that help the architecture designer to understand the environment surrounding him and the richness of its details, making him more creative. Visual thinking makes the architecture designer more capable of solving design problems in a visual range, and the mental processes associated to the visual thinking elevate the designer's creative thinking to a higher level and help him to become more capable of using visual elements of the environment -with its meanings and symbols- in original architectural designs. The environment represents the beginning of the original design for the architectural designer. The visual elements of the environment are the main source of visual knowledge acquired by the designer. This knowledge transfers from nature to the head and the heart of the designer who gives them his own treatments, and then uses the skills of his hand to express it in the form of a special architectural design, that is called the "3Hs", head, heart and hand. figure (3). (Bloom 1977, 32)

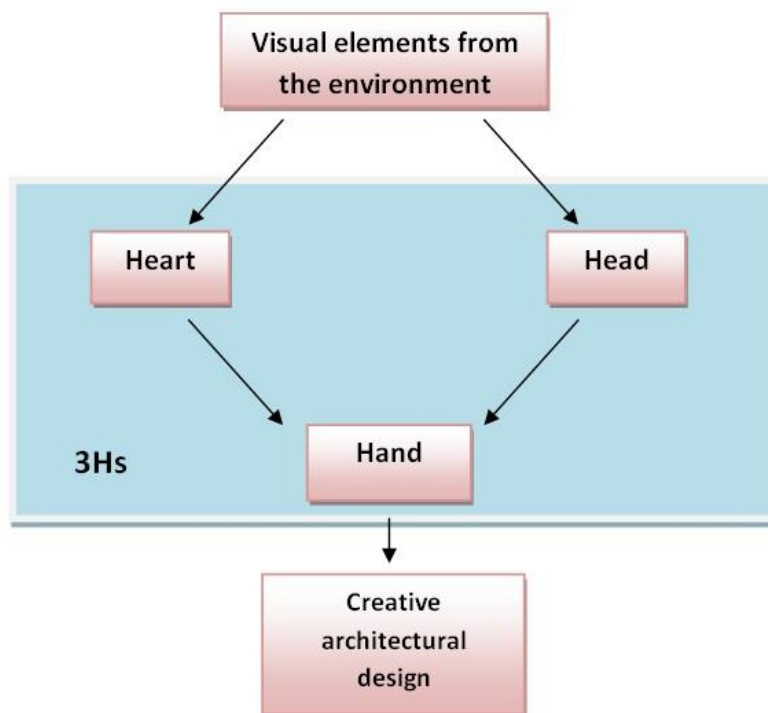


Figure (3): the 3Hs

Achieving the previous process is related mainly to the designer's visual thinking skills, which are very important for him to be able to realize the environment and express it, these skills are:

1- **Visual reading skill:** It means the ability to determine the dimensions, and the nature of visual elements.

2- **Visual discrimination skill:** means the ability to recognize the visual forms, and distinguish them from other forms.

3- **Perception of relationships skill:** the ability to recognize the relationships among visual elements.

4- **Interpreting information skills:** the ability to explain the meanings of symbols, and signs of the visual forms.

5- **Information analysis skills:** means the ability of the designer to focus on the fine details of the visual form, and attention to macro and micro data.

6- **Understanding the meaning skill:** Means the ability to extract new meanings, concepts, and principles through visual elements, and this step is the outcome of previous steps. (El-Howaidy 2004, 194)

These skills have always been a part of the architecture designer's designing process through history, even though he didn't really know that it is a scientific process, related to scientific studies. This shows very clear when we study the ancient architecture and the environment surrounding it, specially the ancient Egyptian architecture, which is a life sample of the architecture being a mirror of the environment through the designer's visual thinking.

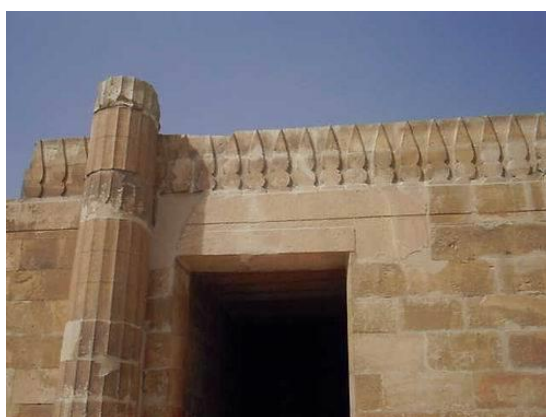
Visual thinking and Islamic architecture:

The Islamic architecture reflects the surrounding environment in all its details, which represent the basic reference for the Islamic architect. The Muslim artist's sense of his environment is not only due to his aesthetic admiration, but also because it is a reflection of Allah's beautiful creation (Fathy 1979, 19). This is the main reason why the Muslim architect watched it, studied it and interacted with it. This visual interaction is the beginning of visual thinking, and the mental and emotional processes related to it, which led the Muslim architect to the visual awareness that he needed to read the visual sentences of his environment. These visual sentences presented the mental and emotional stimuli which invited him to generate these important visual queries, the answer to these queries became integrated architectural solutions. The Muslim artist was able to express his connection to the visual elements of his environment through his architecture, which appeared in the dome, minarets, and any other architectural forms that he designed. The dome design is a reflection of the sky, through the pointed section, as well as the various decorations that decorate the outside of it, which took the symbol of the rise up against the gravity of the earth.

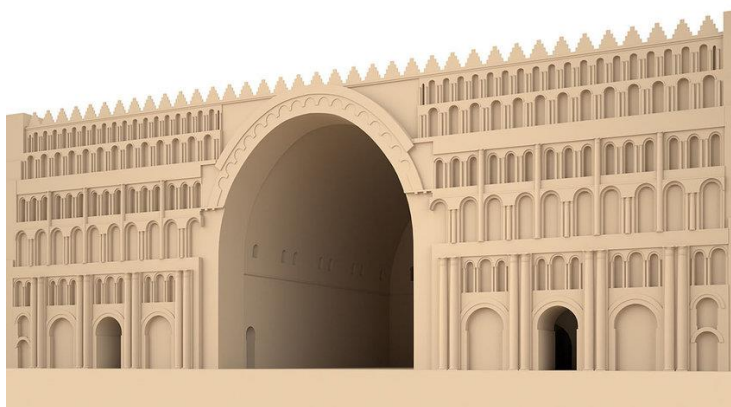
The Muslim artist was also able to include the architecture forms from previous civilizations in his visual thinking processes. These different styles of architecture helped him to create Aesthetic solutions of the Architectural elements of his buildings. Only the beauty of the previous architectural forms, and their sculptural decorations motivated the Muslim architect to transfer them to his buildings, adding to them some of his vision and feelings. This appears clearly in the Islamic Moqqarnas design which presented a development of the pendentives, which created by the Arabs in the first and second century, to be able to move from square shape, to the circular shape in the corners, and also used by the the Sasanians in the third century (pic 1). It was also shown in the design of the "Shorofat", which might be inspired by the ancient Egyptian kheker frieze, pic (2), or it might also be inspired by the Sasanian architecture, like these which found in taq kasri in Iraq. pic(3).



Pic (1): Al-Muqarnas at the tomb of Ata-Uzbekistan -977 AD



Pic (2): House of the South - King Zosser-Saqqara-2665-2645 BC.



Pic (3): A three-dimensional image of Taq Kasri-Iraq

This link between the environment and the architecture affected also the Muslim receiver, who read the environment again through the architecture. This architecture presented to him the same visual elements of his environment, which he appreciated, in a different way created by the designer. This difference motivated the receiver by adding the element of excitement, which played a great role in directing the receiver's visual awareness to the design. (arnheim 1997, 112)

In the end we can say that the Islamic architecture is an important approach to see the Muslim architect ability to not only use his hand but also use his head and heart through the visual thinking processes. This ability helped him to create a magnificent designs achieving what we

call nowadays "bloom's taxonomy". This taxonomy collaborates the mental, emotional and hand skills, in other words it mixes between the visual thinking processes and the ability to apply its results in reality. And that what the Muslim architect did without even knowing.

Examples:

Example No. 1:



Pic (4): shorofat Ahmed ibn Tulun moaque-Cairo-877A.D

The balconies (shorofat) of Ibn Tulun Mosque are considered unique forms architectural balconies, as they take the form of prayers raising their hands praying for Allah, this Idea merges the philosophy of the Islamic religion, and the architectural use that the Muslim architect needed to achieve.

This example reflects the use of the visual thinking process by the Muslim architect, at first he identified the problem that needed to be solved, secondly he put the solution that combined the spirit of the Islam with the practical usage from the visual environment around him.

Example No.2:

The Muslim artist also used visual thinking process to put his own signature on the architectural sculptures that he observed from previous architectural sculpture, like the Plant-inspired ornaments such as grapes and grape leaves motifs.



Pic(5):graped ornament –Ahmed Ibn Tulun moaque-877 A.D

The Muslim architect didn't use the ornaments from the previous architecture as it is, he merged them with his own culture and spirit, to create new and creative grapes ornament, for example these ornaments used in the Ibn Tulun mosque, look like the five-looped grapes leaves, and those small circles resemble the fruits of grapes, pic (5).

Example No. 3:



Pic (6): shorofat Mohamed Ali Palace-Cairo-1901

In this palace the Muslim architect used Cobra in the design of the shorofat, it was a unique design inspired visually from the ancient Egyptian temples, this design confirms the theory of using the ancient buildings as a visual inspiration, that motivates the brain to start a lot of visual thinking processes, helps the Muslim architect to design creative architectural sculpture designs.

Conclusion:

Visual thinking is a collection of mental processes that the designer had since ancient times. It has become one of the important topics of scientific research recently due to the evolution of different sciences and their correlation to each other. Visual thinking has become linked to several important terms like emotion, symbolic, visual queries and visual search. It became also clear that seeing is the start of the whole visual process that leads to imagination which leads also to evaluate the designer's ability to be aware of his surrounding environment, and its visual elements. This visual awareness helped to build great architecture like the Islamic architecture and it helped also to enhance not only the designer's ability to think visually but also the receiver's ability.

Results:

- 1- The need to develop the designer's ability to recognize the visual elements in his environment, through the development of his visual perception.
- 2- Introducing the visual thinking definition and the mental processes related to it to the designer, and clarifying its role in developing his ability to solve design problems.
- 3- Emphasize the importance of the environment as a source of visual knowledge used in design.
- 4- Attention to visual thinking as a mean of developing the imagination and creativity of the designer.

Recommendations:

- 1- Studying the visual thinking and its role in design throughout history.
- 2- - Developing the visual thinking of the designer through the study of imagination.
- 3- Studying the emotion and its relation to the designer's visual thinking.

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