

## Effect of Islamic art on modern architectural claddings in Arab countries (Case study on U.A.E)

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### Abstract:

Art is considered a mirror for the society and a way to recognize its civilization and progress. Due to the technological development which spread around the world especially post the industrial revolution in Europe which reflected its significances on all aspects of life. We can find that effect is so obvious in architecture as it is considered a crucible where all life variations, that affect society with all its axes, are being molten inside.

A Designer deals with architectural space in different technical ways, that represent a reflection for the cultural values of the society. That reflection in its artistic mold represents an aesthetical value that can be seen by whoever meditate, think or deal with the artistic work, as if it tells him/her about the culture and expresses their inner selves and various life values. Architectural claddings aren't separated from architecture but they are available through history with their various shapes, materials and uses through all ages.

That's why functional and aesthetical values are considered of the most significant foundations that architectural claddings have to express, concepts of aesthetics varied for specialists according to the field of expertise, but there are some common basics which are how to realize the aesthetical and functional values? How to achieve and sense them? Some are thinking that they are linked to harmony and compatibility among shape, color, texture and benefits, others think that it can be achieved through integrity between elements of the shape and its proportions. That's why we find that human aspires beauty, sense of beauty is through affecting and reaching inside human-self through 3 ways which are sensibility, understanding and feelings, based on that; beauty is divided into 3 kinds:

Sensual beauty- emotional beauty- intellectual beauty.

Beauty has measures that vary according to cultural, natural, social and economic habitats among Islamic and western societies.

### Research problem:

How modern architectural claddings in Arab countries were affected by Islamic intellect under the shade of modern technological techniques? (Case study on U.A.E)

### Research significance:

Studying the functional, aesthetical aspects of architectural claddings in Islamic architecture. Study of modern architectural claddings in Arab countries and how their efficiency and aesthetical and functional performance.

### Research goals:

Rooting of the concept of claddings functionality as a heritage intellect and how to utilize them in a modern way under the shade of technological development.

**Research methodology:**

Descriptive methodology then analytical methodology.

**Key words:**

Islamic art- architectural claddings- Arab countries

**المخلص: -**

يعتبر الفن مرآة المجتمع والسبيل للتعرف على مدى حضارته وتقدمه. وفي ظل التطور التكنولوجي الذي ساد العالم وخاصة بعد الثورة الصناعية في اوروبا والذي انعكس تأثيره على كافة مناحي الحياة. نجد أثر ذلك واضح في العمارة حيث انها تعتبر البوتقة التي تنصهر بها كافة المتغيرات الحياتية التي تؤثر على المجتمع بشتى محاوره.

يتعامل المصمم مع الحيز المعماري بطرق فنية مختلفة، تمثل انعكاساً للقيم الثقافية للمجتمع، وهذا الانعكاس في قلبه الفني يمثل قيمة جمالية يراها المتأمل ومن يتعامل مع العمل الفني وكأنها تحكي له ثقافته وتعبّر له عن ذاته وقيم حياته في نواحيها المختلفة. والتكسيات المعمارية لم تكن منفصلة عن العمارة بل هي متواجدة عبر التاريخ بأشكالها وخاماتها واستخداماتها المختلفة في كل العصور.

ولذلك تعتبر القيم الجمالية من أهم الأسس التي يجب أن تعبر عنها الأعمال الفنية سواء كانت تكسيات معمارية أو تشكيلية، ولقد اختلفت مفاهيم الجمال عند المتخصصين حسب المجالات المختلفة ولكن هناك أسس مشتركة وهي كيفية تحقيق القيم الجمالية وكيفية إدراكها والأحاساس بها. فهناك من يراها مرتبطة بالتوافق والتناغم بين الشكل واللون والملمس، ومنهم من يراها تتحقق من خلال التضامن بين عناصر الشكل ونسبه.

ولذلك نجد أن الانسان يسعى إلي الجمال، والأحاساس بالجمال يكون بالتاثير والوصول الي داخل الإنسان عن ثلاث طرق، الحس والفهم والشعور، وبناء عليه فالجمال ينقسم إلي ثلاثة أنواع:

جمال حسي وجمال عاطفي وجمال فكري

وللجمال مقاييس تختلف باختلاف البيئة الثقافية والطبيعية والاجتماعية والاقتصادية بين المجتمعات الاسلامية والغربية التي يعيش فيها المجتمع.

**وسوف يتناول البحث: -**

تأثير الفن الاسلامي علي التكسيات المعمارية واستخدام الفن الاسلامي بتقنيات وتكنولوجيا حديثة، دراسة حاله لدولة الامارات

**مشكلة البحث**

تتلخص مشكلة البحث في الاجابة على السؤال التالي:

هل التكسيات المعمارية الحديثة تتوافق مع مضمون العمارة الوظيفي والشكلي ومدى ارتباطها بالعمارة الاسلامية؟

**أهمية البحث**

- تحديد دراسة الناحية الوظيفية والجمالية للتكسيات المعمارية في العمارة الاسلامية.

- دراسة للتكسيات المعمارية الحديثة ومدى كفاءتها وادائها الجمالي والوظيفي

**أهداف البحث**

تأصيل مفهوم وظيفة التكسية كفكر تراثي.

تحليل المعايير الوظيفية والجمالية التي قامت عليها العمارة الاسلامية ومن ثم توظيفها في التكسيات الحديثة.

**منهجية البحث: -**

يتبع البحث المنهج الوصفي ثم المنهج التحليلي.

**الكلمات المفتاحية: -**

الفن الاسلامي - التكسيات - العمارة - الدول العربية.

**Introduction:**

**“Architecture is the mirror that people’s culture, rising and development are reflected on” Victor Hugo<sup>1</sup>”**

Islamic arts are considered among the applied arts that cared about the functional and aesthetical aspects, Islamic civilization was distinguished by a philosophical intellect that characterized it from other civilizations, no one could outlook the original, aesthetical and substantial philosophy that filled the Islamic art. We find that the Islamic, architectural heritage is a bright sign for the innovation that Islamic civilization contributed with it in enriching the humanitarian civilizations. Islamic architectural art at its beginning was based on architectural, decorative elements that match its spirit, so they came out almost the same at most of the Islamic countries with slight variation that was imposed by the habitat, from climate and inherited skills and experiences of the people in architecture and construction.

Architectural work is the occupation of both architectural designer and artist, each one of them is completing the other. In Islamic art we find that both architect and artist relied on the idea of cladding whether interior or exterior, that was obvious in mosques, palaces and fountains. Muslim artist nailed the exterior and interior claddings in a compatible way with his intellect and the surrounding environment from religious, political, economic, social and cultural factors. One of the first architects who recognized the relation between ornamentation and architecture was (Leon Battista Alberti)<sup>2</sup> at his analysis of the renaissance era, he identified ornamentation as a separate element linked to the surface of the building and is being added later on to the exterior of the building. He also suggested another identification “it is a catalyst element that define beauty, in addition to being a mediator between the pure nature of the material and the innovative structure of the architect that carry the visual perfection with final touch.

<sup>3</sup>**John Ruskin** confirms that ornamentation is revolving around the essence of architecture instead of being an exterior cover. He thinks that ornamentation reflects the interior beauty of architectural engineering, and it is a main part of the architectural building, he considered that the greatness of a building can’t be shown through the building perfection but with the type of its ornamentation. <sup>4</sup>**Gottfried Semper** considered ornamentation as a process that is about the essence of the architectural building.

World war 1 and 2 in 1919-1939 had their influence on architectural and economic development with the appearance of new theories in architecture, planning, residential towers and managerial buildings.<sup>1</sup> **Walter Gropius**, 1883 is the first pioneer of modern architecture who claimed for applying science and technology in architecture, he is the one who set the roles and basics for using iron and glass in architecture and applying modernized ways in manufacturing the building materials.

### Identification of claddings:

Cladding in the dictionary means covering with a material or paint on a structure or a substance on some surface

1

Cladding is a concept for everything that can be fixed on walls, ceilings, floors of structure or adhesive whether exterior or interior for an aesthetical and functional purposes to gain a certain significance or holism or harmony with the surrounding.

The researcher thinks that cladding can be an ornamentation units of tiles, the used materials vary according to the nature of the building and its style.

Many materials have appeared recently due to the technological development such as G.R.C. instead of gypsum, light metals like aluminum and glass. The development of printing such as 3D Print and modern ways of digging such as digging using CNC machine on all materials, it has become easy to produce repetitive units that are used in cladding and it doesn't cost as the handmade way.

Most civilizations were characterized by intellect and philosophy which reflected on all elements of life and also on architecture. Art and architecture aren't just shapes and formations but they are intellect and symbols inside those forms and it can't be understood or realized unless it was looking at through its reality and civilizational, psychological and symbolic background. We find that each civilization had its own style that distinguished it from the others and that style has become its own.

### The concept of style:

It is the sum of experience of architects that achieved the stage of stability at some era and has become a general character for buildings of certain age, and it's not right to apply it on other ages unless it was faked due to the change of circumstances and humane needs

2

A style could be understood as the superficial appearance and the details that are taken from earlier architectural works that characterized certain ages across specific period of time such as Pharonic, Greek and Roman.

3

With time new circumstances, needs and potentials appear that require to restudy and experience. So another experimental period appears and buildings adopt new style.

4

That what we are facing as we see an Islamic style that has been used in modern architecture, the architect when uses an old style from previous civilizations in modern works

5

, that doesn't mean that the building is ancient but we say it is built by Islamic style or a building with Pharonic style, style has become a characteristic for a previous era.

### Identification of ornamentation:

It is a symbolic art that expresses the cultural heritage of the people, as it has ideological elements, anthropological believes, heritage, inheritances, and ceremonies. The Gulf countries are considered among the areas that handled ornaments as a main and significant element in its architecture whether at public or private buildings, due to the major changes that the Gulf area

has been through, politically or economic that have a noticeable and direct effect on the outputs of architecture including ornamentation that faced a dramatic, clear change in all its architectural and technical characteristics with time passing and developing, so its forms and functions multiplied and it has become hard to recognize the changes in its architectural and technical characteristics and the factors that affected it with time which are ( oil discovery- industrial revolution- information technology- globalization- architects- cultural and environmental factors) those factors with time and industrial and technical progress have turned ornamentation from 2<sup>nd</sup> dimensional drawings into 3D architectural element that sometimes as an exterior cover for the whole building. Ornamentation is considered one of the humane communication bridges among general societies despite their cultural differences.

6

Ornamentation is known as the decorative movement that its base is a specific, individual unit, that unit is the 1<sup>st</sup> cell that the ornament being is consisted of and that being is affected with the nature of the structure or the combination that the ornamentation system is formed from, that structure is submitted to a repetitive system that has a specific features and a symbolic significate, that repetitive system could keep that signification during the process of formulation or that significate might disappear during the process of division and reduction.

7

### **A historical brief about the intellect in Islamic architecture:**

Islamic architecture since the appearance of the first basic architectural elements of the first mosque in Islam which was the shape of prophet Mohamed mosque in Al-Madina, has witnessed a major development in particularly after the expansion of the Islamic countries and it was joined by many nations with ancient and elegant civilizations under the banner of Islam, all of that led to uploading the Islamic architecture with new data, elements and vocabularies that contributed in developing means of arts and architecture in the Islamic countries into high, giving levels of aesthetical, artistic and heritage aspects. Islam in half a century of its start, has entered the most ancient centers of human civilizations, starting with Mesopotamia, Sassanid empire\*, Egypt, and Byzantium where the Greek and the Roman heritage to Syria, northern Africa and Spain too. That wide spread is a significant, historical and civilizational transformation in humane life. Architectural Islamic arts have that emerged in less than a century after the prophet immigration, had absorbed the tributaries of those civilizations, that's how Muslim Arabs have been affected by the aesthetical values of the arts of those ancient civilizations. So they cared about their architecture and decorating it with various architectural, geometrical and ornamentation elements and vocabularies which have earned it an aesthetical look that matches the importance of the role that this architecture plays<sup>8</sup>.

Muslim artist didn't care only about the appearance but his intellectual philosophy was built through his religious doctrine that everything was centered around, he cared about the content and the appearance, so the basics of design were connected to the mathematical side especially the geometrical shapes as shapes and numbers don't show in their quantitative template, but they also have their qualitative indications. If a number or shape was looked at from the symbolic side, it expresses the unity and reflects the value within it. The Persian philosopher Al-Sayed Hussein Nasr\* said "holy Mecca is the center of the universe where earth is connected to the sky" he also mentioned that the square of holy Kaaba was in the buildings yards, and it's

not just a square but it symbolizes perfection and constancy, also the octagonal shape at many mosques isn't just a constructional shape that helps on carrying the dome, but it's a reflection of the divine throne that is carried by 8 angels. From this doctrine, Muslim artist served life with religion and he cared about the environmental, social and economic factors in all the architectural and aesthetical shapes of the elements. Elements of architectural formation was characterized by what they contained of general exterior structure and architectural elements of the Islamic civilization with many characteristics, most important of them is the greatness of the appearance and quality of the function.

### **Types of claddings in the Islamic age:**

Elements of architectural formation are considered of the most important special formative elements of Islamic architecture that artist and architect excelled in functionalizing them that showed in the geniality of applied arts that gathered between beauty of the appearance and the vitality of the reduced abstract from elements of nature and the quality of its functionality that is compatible with humane traditions, costumes and needs. Muslim artist nailed the interior and exterior claddings of walls with all materials that were available back then, some of them the purpose was aesthetical such as granite tiles and ornaments whether exterior or interior, and others the purpose was functional as bays (mashrabiya), domes, muqarnas and air catchers, etc. Ornamentation is the most important art that architecture generally is characterized by and in particularly Islamic architecture as the east was clearly influenced by that civilization. Artist expressed his thoughts and feelings through many elements such as human, animal and plants. The most important ones are the architectural civilization in Egypt, Iraq and Syria, despite the fact that Muslims used some elements of ornamentation from the ancient Greek and Roman civilizations but they also developed and evolved new artistic patterns that belong to them and distinguished them, their ornamentation philosophy included all fields of life, and were done with all materials and sizes using all available techniques at that time. Islamic ornamentation has 4 main elements which are; botanic ornamentation, Arabic calligraphy, geometrical ornamentation then aesthetical shapes and patterns.

Muslims relied on the use of many geometrical elements to express their intellect and philosophy through those shapes. Ornamentation as well depends on the repetition of complex or simple entangled elements as those combinations are being repeated symmetrically according to the need<sup>9</sup>. One of the examples for the beauty of those ornamented claddings the mosque of Imam Isfahan- Samarkand, shape 1 and Alhambra mosque in Granada, shape 2.

Those buildings with all what they have of new arts from their domes, minarets, ornamentations and unique architectural style have added new features on elements that were taken from all ancient cultures and artistic shapes. That was as a result of the Arab Muslims benefiting from the art of architecture of countries and people that joined Islam.<sup>10</sup>





shape 1 mosque of Imam Isfahan- Samarkand



shape 2- interior of Alhambra mosque in Granada

calligraphy is one of the elements and vocabularies that distinguished the Islamic architecture. Muslim artist was so creative in using it as a tool to add aesthetical features where that type of ornamentation has included all types of writings whether on the surfaces of walls, domes, arches, minarets and balconies, then they developed and varied and interfered with flowers and botanic branches. Using calligraphy was discovered since the ancient ages and it was first showed up at the Sumerian days in the Mesopotamia valley that's why all types of calligraphy were used as a mean for expression and decoration in particularly at the Abbasid era at buildings of Samarra, Baghdad and other Islamic cities in the field of decorating buildings and it was considered one of the most valuable vocabularies in Islamic architecture along ages. It was used in various geometrical means and shapes that added a unique architectural style to the buildings. Calligraphy with all its types has contributed- especially the Koufi font- in rooting the common Islamic identity and utilizing heritage in addition to using it with a contemporary artistic way. While Islamic tiles (ceramics) and their use in decorating Islamic buildings are considered of the arts that have been created by Muslims and developed them along multiple centuries. One of the most ancient tiles that were found in Samarra city in Iraq that go all the way back to the 9<sup>th</sup> century and holds rare artistic antiques that were found in mosques and some mansions such as Al-Gawthak Al-Khakany palace. The holy city of Karbala is considered one of the pioneer cities in manufacturing and using ceramic tiles that's why it was locally called the Karbalai ceramic in Iraq and it was used in decorating tombs, mosques and religious and heritage buildings, those tiles were used to cover walls especially in domes, minarets and the interior of the buildings. Shape 3



Shape 3 shows the ceramic cladding using tiles (Karbala ceramic)

Wooden decoration especially bays (mashrabiya) is considered one of the features of Islamic architecture and they were spread at many Islamic towns- as they are the prominent wooden decorated balconies in the building- they are characterized by the beauty of its wooden engravings whether they were geometrical or botanic ornaments, and it is a witness for the beauty of the Islamic architecture and its development through time of its ancient history. Bay (mashrabiya) is considered of the claddings that has a functional role as it allows the passage of the air without letting the sun inside, that's why it was designed using wood. They are usually placed to cover the exterior of windows and balconies that are used for sitting to enjoy privacy and nice weather without being exposed to the strong sun, they are used in the bottom parts of the house to decrease the light intensity and provide privacy, while wider ones are used for the upper parts to help in ventilating the place, as in shape 4<sup>11</sup>. Bay(mashrabiya) added aesthetical values to the street that has the building without interfering with the privacy of the architectural spaces behind the bays. Muqarnases used to have double functionality in the field of architecture as they were used as a transitional, constructional areas and at the same time they were used in exterior architecture, mosques entrances, balconies' bottoms, borders of ceilings and architecture openings of houses, they were characterized - by size accuracy, numerical repetition and subsequent arrangement, shape 5.

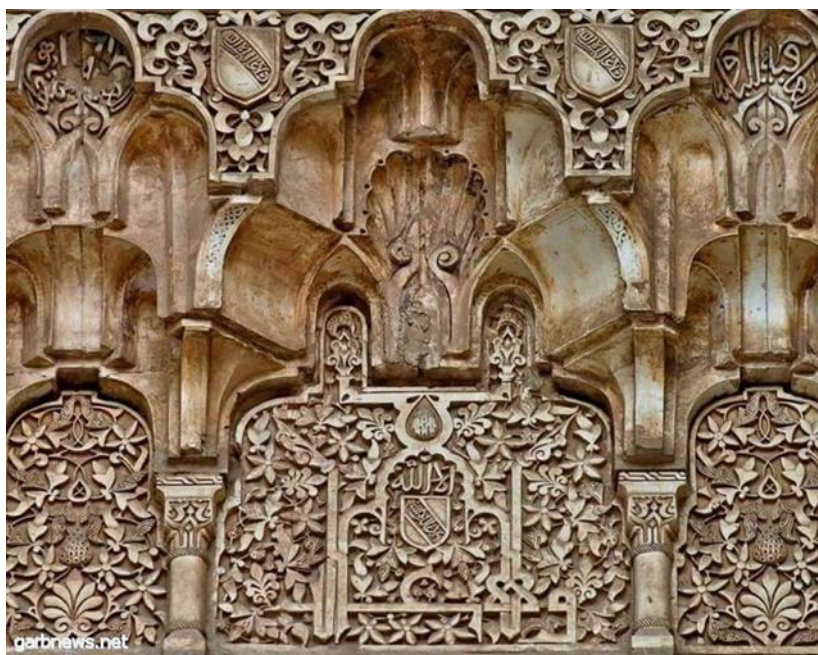
We can notice the philosophical intellect through the repetition of the botanic and geometrical units, it was one of the best features of Islamic art as it was a feature of the universe. Repetition enriches emotions and enhances the feelings, it was the perfect manifestation of the idea of returning to eternity, as repetition itself basically is a genuine and renewable principle in Islam, as in holy Quran many verses and meanings are being repeated in many positions and sometimes within the same subject as in Surah "Al Rahman" also the subsequent repetition of prayer times and fasting, and repetition was found in Islamic decoration to realize the principle of symmetry, as it doesn't mean the presence of only one image at all pieces of the surface but it varies and that variation presents among the ornamentation units, for instance the ornamentation unit of a mosque's dome differs from the unit of the minaret which is different



from the one of the hall, the ornament of the walls differs from the ones of the crown pillars or the ceilings, there is a huge range of variation among the different units that has been met by a continuous repetition, repeating the ornament in a special style at each unit, so that each unit inspires the unity of almighty Allah <sup>12</sup>.



Shape 4 shows the form of the wooden Bay (mashrabiya)



Shape 5 shows the form of Muqarnases

### Materials that are used in claddings in Islamic architecture:

One of the most civilizational accomplishment that has been achieved by Islamic architecture is ensuring the utilization of the local building materials in the Islamic countries and using them in a marvelous artistic way in constructing buildings and decorating them till they match the climate and the environmental conditions, and harmonize with the social and civil life of each country. Some of the materials that were spread back then were:

**1- Bricks:**

They are a building material made of burned bricks that is burned in specific furnaces then organized manually and stretched using mortar.

Clay or dried soil is being mixed with sand with a ratio of 25-30% to reduce the shrinking and grinded well then mixed with water with the necessary ratio, afterwards it is strongly being compressed inside molds of steel and getting burned in specific furnaces. A certain characteristics of bricks could be obtained by adding other materials such as gypsum or other chemical materials, temperature can be controlled inside the furnaces to get certain characteristics, those characteristics vary among to change in color, bearing weights or temperature, absorption of moisture or thermal isolation and other characteristics. Shape 6.

**2- Granite:**

It is a transformed calcareous rock that is consisted of extremely pure calcite and it is used in cladding floors and walls, it is characterized by its tolerance and has various colors. Shape 7

**3- Gypsum:**

It is a solid material made of  $H_2caso_4$ , it is available in lands with soil and limestone, it has white or gray color that has a shade of red, it was used in exterior ornamented claddings as it is easily reformed. Shape8

**4- ceramic tiles:**

That handicraft was developed in the 14<sup>th</sup> century during Mameluke era when most refined tiles and the most beautiful were produced, after adding colors to them like blue, green or torques then a layer of glazing, they are being burned one more time at temperature 1200 C, what distinguishes that kind of art that was nourished at various Islamic countries is those engravings on the tile, Muslims handicrafts produced various types of ceramics that used in decorating walls, floors and interfaces of buildings, mosques and the interiors. Shape 9

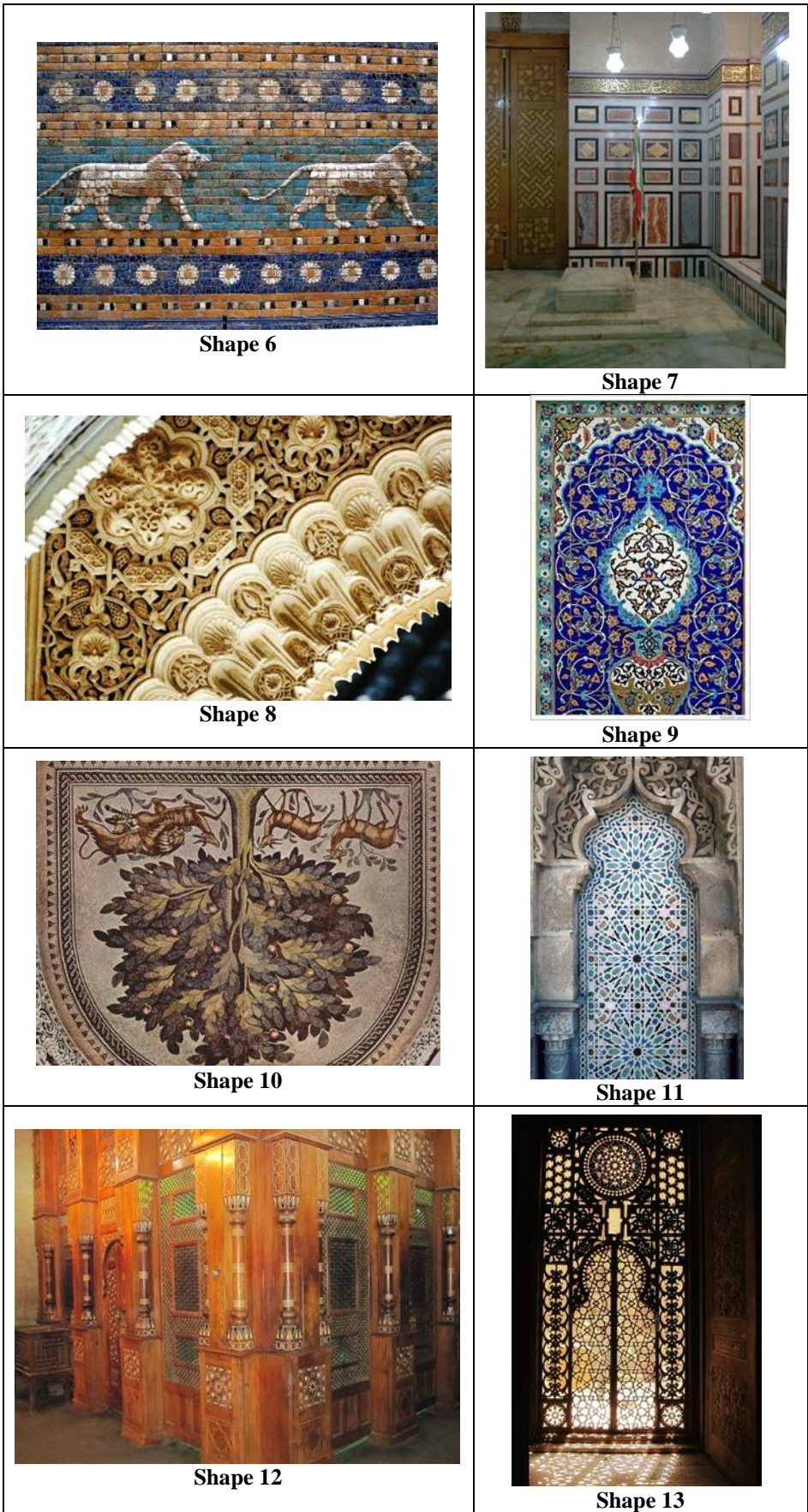
**5- Mosaic:**

Is the art and handcraft of creating tiny cubes and using them in claddings of floors and walls by fixing them to the tiles above the surfaces and forming variable designs with multiple colors, several materials could be used such as stones, glass, granite, etc. shape10, there was another type called Zlig which resembles mosaic but it is different as it consists of geometrical mosaics that are being gathered to cover walls, ceilings and fountains, it is made of ceramic only and it was famous in Morocco. Shape 11.

**6- Wood:**

It was highly used during the Islamic ages in windows, doors, bays and ceilings. Wood has been engraved with various geometrical or botanic ornamentations. The reason behind the use of the wood is it is considered hydroscopic (absorbs only water), minimal stretching effect due to temperature, doesn't transfer sound, temperature, or electricity, has an importance in thermal, electrical and light isolation, it doesn't rust and can be reformed in many shapes, dried woods are light as well. Shape 12,13.





## Summary about architecture under the shades of modernity:

### The concept of modernity:

The general concept of modernity means modern intellect or action, more précised meaning is to describe the cultural movement in the western society during the period of the end of 19<sup>th</sup> century till the end of the 20<sup>th</sup> century, the concept has been widening to include activities and outputs that have been emptied by people who felt that inheritances of art, architecture, literature, faith in doctrines, social organization and even daily life are just obstacles against development that has been imposed by the industrial society which has created new social, cultural, economic circumstances that are matching the industrial development and the concept.<sup>13</sup>

### The concept of identity:

It Is the reality of a thing, the absolute character that has the essential characteristics that distinguish it from any other and it is also called the self -unity.

It is being splendid from the other and being identical to the self, it is self- uniqueness and what is specific about an individual or a society from characteristics, values and qualities. The term identity is being called for 3 meanings which are personification, the person himself and the external existence.<sup>14</sup>

### The concept of heritage:

Heritage can't be a civilizational feature of any civilization, but as much as it carries of value and dynamicity to continue, reform and evolve, that's because heritage is a living being, if we refuse it, we refuse the need to our development and insurance to our distinguished origins but also we lose many values and the human spirit that ensure our identity.

Heritage is a comprehensive concept of everything that is inherited of values, visions and traditions, that doesn't mean that it belongs only to the past as it is a past event, but it is a cultural extension that is compatible with our state and is running through our modern life paths that affect the political, social, cultural and spiritual life and dealing urbanely with the surrounding environment.

Heritage is a humane, and social tool in a dynamic movement between the society and the renewable reality. It is a motive force for the movement of social development and it is not an obstacle as it has elements of connection with the national identity, accumulated experiences, and knowledge or heritage that has dynamicity and life, it is useful for the present and supports the missions of the future. It represents a foundation for innovation as its sons due to their dynamicity which is part of their culture and they have practiced innovation and creative production. That's how heritage becomes more like underground water that feeds the roots of a hungry plant that has all the potentials to nourish.

### The effect of modernity on forming the features of architecture:

Architecture is one of the most significant types of arts, the art of architecture is a cultural production that is strongly linked to cultural, social, economic and technological factors for ages, it has been strongly influenced by those factors for ages. And since modernity is a reality that predicts a new stage transformation (the current civilization), it has influence on cultural, social and economic factors, etc. that's why architecture can't stand far from its influence as it is strongly linked to those factors. It is interesting to find out that the architectural challenges



that have been determined by the features of the information era can't be specified in just trying to find solutions or create architectural forms that are required for the compatibility with developments and changes in information technology by the same current traditional means and methodologies and doesn't target the

production of new styles or unfamiliar formations may be due to the absence of the regular concepts of shape materialism and formation that are known in the society of information, but those challenges offer some significant philosophical entrances for the contemporary architectural scene that derive the thinking process. To create an interactive vision (between the receiver and the architectural product) for the core of architecture, to inspire in other multiple fields such as science, technology, geography, etc. mixing design and science with various arts which offers new core formulations for architecture that widen the road for new reality.

It is noticeable that the architectural innovation that is allowed by the informational revolution is no longer dependent on only formative creations but it leaned towards intellectual works that carry meanings and philosophy to the receiver to invite him to think and interact with it.

### **Architecture in U.A.E under the shades of modernity:**

Before talking about UAE during modernity we have to mention in brief the nature of life and architecture pre-modernity. UAE in the fifties and sixties due to social, economic and geographical factors used the available local materials in the habitat, we can see Al-Arish houses made of palm fronds during summer to allow passage of light and air, tents made of animal skins were used in winters, shape 14-15. After a while houses were built of soil and used thick walls as they act like thermal storage as they absorb the heat of the day and stop it from entering rooms so they reduce thermal exchange between the interior and the exterior, also sea stones (corals) were used in building houses by the sea in summer, coral has tiny pores that prevent heat from getting inside the house. At the beginning of the seventieth the government started to build what was called public houses and they followed the Islamic intellect in designing them as they had wide inner space and a separated place for men and women, UAE never knew claddings but for few traders who have been to India as a cultural exchange took place and those traders imported ornaments to decorate houses, they also knew what is known as Al-Paragel to modify the weather inside the house and they were only available at the traders' houses, shape 16. After a while Indian workers came to UAE that's when simple ornamented claddings spread, shape 17.



Shape 14 shows the tent.



Shape 15 Al-Arish houses



Shape 16 Al-Paragel



Shape 17 shows ornamented claddings

Due to the many economic, technological and political changes that have happened in the Gulf area, which noticeably and directly affected the outputs of the Khaliji countries. At the beginning of the eighties in the past century, (Al- Sheikh Zayed) the ruler of UAE has hired the English engineer John Harris\* to start the modern architecture that UAE is famous with nowadays. From the historical aspect, the movement of ornamentations along ages has varied a bit, there are periods when it increases and periods when it decreases till the new movement the post-modernity when architects had neglected ornamentations and its complications during the period of modernity but it came back strongly during the period of post-modernity after creating new contents in physics, mathematics and philosophy. Technology has contributed heavily in this transformation, as the come back to ornamentation in a different way can't be separated from the spread of computers and their use in architecture during the nineties, building structures and geometrical forms happened with ease and the diversity in the building materials was one of the most noticeable developments that contributed in the realization of

such types of buildings, it contributed in easing the application of such types of buildings so ornamentations were used on large surface areas and might even form a whole cover for a building after being only implemented in limited areas of the building. We can find in The Green Planet building linear ornamented claddings with modern treatment where the artist ELSeed\* has engraved them and used Arabic calligraphy in a free style without being committed to the rules of the regular Arabic calligraphy (calligraphitis art). The building cladding is in the form of intertwined letters as

if they were swaying and dancing on the building as shown in shape 18, a new material was used which is (Iridescent silver spray paint, which caused the text to change its color according to the light and the angle of view<sup>15</sup>).

Technology and smart materials have provided for architectural claddings in general and for ornamented claddings in specific, the ability to prove its existence as a treated art, they allowed the movement of interfaces, they were able to breath, perform and deliver the required art for the recipient in a way that was hard for architects in the past to execute. That was the beginning for the introduction of the exposed glass curtain walls which are widely used in the design of all commercial interfaces and skyscrapers in the Gulf area at the commercial places.



Shape 18, The Green Planet-UAE- Dubai.

### **The concept of curtain walls:**

They are a type of claddings for buildings' facades, they are un-carrier walls that are put on the exterior interfaces and they aren't a component of the frame and structure of the building. One of the most important type of fillings for curtain walls, the glass fillings, the metallic ones (aluminum- iron), wood, plastic or asistos, as they are metallic frames that have glass slabs in-between them.<sup>16</sup>

Those walls when glass is used inside of them are characterized by the ability to allow natural light to penetrate deeper inside the building.

One of the successful models of using exposed glass curtain walls is the sea towers building in Abu Dhabi, shape 19.



### The sea towers building in Abu Dhabi:

The architect applied the cladding on the building using the concept of the bay (mashribya) but with a totally different way of execution as he mixed the intellect of the mashribya in achieving privacy, gaining solar energy and reducing the glow with the famous Japanese origami\* to realize his idea in climate treatment in the facade of the building, he also designed a movable shading system that consists of 3 units origami umbrellas that work as and those units work as individual shading instruments. Those umbrellas are opened in different angles as a response to the movement of the sun and to protect the building from the direct sunrays. The building has received the innovation award as the best building and the best project in the middle east for the year 2012, the



shape 19, The sea towers building in Abu Dhabi-UAE.

building has high aesthetical, designing and functional values that imitate the nature and achieve the best utilization of the building and the surrounding environment.

### The building of the future museum:

One of the obvious examples for the use of ornamentation claddings with Islamic style is the future museum. (under construction will be opened in 2020) as the poems of Al-Sheikh Mohamed ben Rashid the ruler of Dubai were applied in a different way in the future museum, shape 20,21,22 as the writings have covered the whole building with different ratios that match the size and the building structure. They are close to the ring shape. The designer Shaun Killa\* used the most modern techniques and he chose the structure to be oval shaped, that's how it was normal for the ratios of the writings to change, when comparing the new designs with the geometrical shapes that were used in the old buildings we can notice the dramatic change in the



shapes and means of execution. That oval shape was executed from metal and 3-D printing was used in its construction, also hologram technique was used to complete the oval parts, the outputs of the ornamentation claddings for that building were different and innovative,<sup>17</sup> starting with the exterior ornamentations that allows the shades inside the building, second the hologram and the modern, different and renewable way of showing.



Shape 20- day image for the future museum shows the use of the writing in cladding.



Shape 21- night image for the future museum shows the cladding as a source of lighting for the building.



Shape 22- shows the interior of the museum.

### The louvre museum in Abu Dhabi:

The dome of the louvre museum that was designed by Jean Nouvel the international French designer is considered one of the most modern application in cladding using the intellect of the Mashribya. The dome radius is 180 M. and covers most of the museum. What Jean Nouvel ensures was that the dome was inspired from the net of the Mashribya and it consists of 8 floors, 4 of them are made of steel and 4 internal layers which are separated by steel structure with

height of 5 M. and consist of 85 sectors, each sector has the weight of 50 tons and is characterized by being covered with numerous geometrical shapes (total of 7850) with various sizes.

He inspired the idea of the traditional Mashribya and directing it towards sunrays that get broken on the surface of the wooden cone of the Mashribya (to reduce the intensity of the light and grant the interior spaces an aesthetical effect through the formed light formations during the passage of the light through the holes of the Mashribya. The architect transferred the vertical screen of the Mashribya to a flat horizontal element that has been formed in the shape of compressed dome that allows the entry of sunrays through holes that resemble light flow among the sharp leaves of palm fronds and the geometrical shapes, shape 23.<sup>18</sup>



Shape 23 the image on top shows the external shape of the dome- the lower image shows the shape of the internal dome.

### Abu Dhabi international airport:

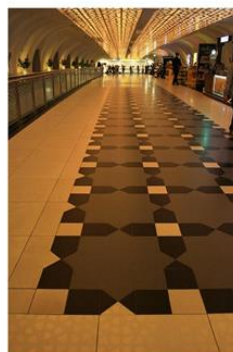
The French architect \*Paul Andréa designed Abu Dhabi international airport, the design was inspired from the Emirati heritage as the shape of sand dunes while the interior the designer used claddings by ceramics on the floor and geometrical ornaments in the ceiling, shape 24. We can see that most of the airport was treated by claddings inspired from the Islamic ornamentation as in shape 25-26.



shape 24 shows the ceramic claddings and the Islamic geometrical units.



Shape 25 shows the interior claddings of the airport.



Shape 26 shows several materials of claddings- Abu Dhabi international airport.



From the previous we have reached that cultural, technological and economic developments have contributed in the contemporary, modern techniques that defined a comprehensive system in building and controlling the weather, air conditioning has become essential in each building and they have given up the old solutions while the old elements that were used in climate solutions (air towers- aesthetic gears- umbrellas- Mashrabiya) have turned into outlook elements that buildings are being decorated with and express traditional architecture. While geological nature is no longer has a powerful effect on the level of architecture. As the post-modernity style is connected to the modern style from the cultural and environmental sides. The same influential factors are combining them as they evolve and development of their tools along time. Information technology and how it is used by architects is considered the most efficient and influential factors in this era. Building materials have become available and in case of their shortage they are being imported from outside. We can also notice the architects being influenced by the Islamic intellect in some architectural designs in the Arab countries with the use of the idea of claddings whether it is exterior or interior.

### Results:

- 1- Despite the technical and industrial development, ornamented claddings are still considered the bridge and the translator that link the building to the habitat, and link people to history and culture, hence ornamentation claddings are one of the tools of the local identity of the building, the habitat and the total urban context within the frame of sustainability. In particularly in the Gulf countries where their ornaments reflected their religious beliefs and local culture.
- 2- Ornamentations have developed noticeably during the period of oil discovery as the main reasons of development are importing new constructing materials, building factories and the availability of the machines which led to change in the way of building the ornaments that resulted in texture and style different from the old ornaments that were made by humans.
- 3- Technology has led to a dramatic change in the shape of ornamentation and it is also considered one of the factors that its effect will remain in the future, as it eased means of construction and building covering for architects, it has become possible to realize innovative designs that never existed before but it is also possible to form new shapes of ornamentations inspired from Islamic ornaments. That development isn't only about the look but also about the function as the designer provides architectural, environmental solutions for the building and also means and solutions that contribute in the sustainability of the building. All those factors are being studied and applied electronically to test its quality then apply them on reality.

### Recommendations:

- 1- Focusing on studying the future factors that affect the ornamentation like technology and smart material.
- 2- Studying the environmental solutions for the ornamentation claddings in order to improve the performance and the sustainability of the building.

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<sup>1</sup> Victor Hugo was born on February 26, 1802- May 22, 1885 he was a French novelist, poet and writer, he was considered one of the most famous writer of France, his writings have been translated to all languages.

<sup>2</sup> Battista Alberti was an Italian architect, mathematician, poet, philosopher, archeologist and musician.

Mallgravem, H.F. Architectural Theory. Bermann, -3 W. Cambridge University Press. p. 29.2006.

<sup>3</sup> John Ruskin was an English poet, art critic, and social thinker who had many writings and his books and art had a huge influence in the Victorian era.

<sup>4</sup> Gottfried Semper was an art historian, architect, lecturer and university professor in Germany. he was born in Hamburg, and was hired in Dresden Academy of Fine Arts, May 1834- May 1849.

<sup>1</sup> Walter Gropius was a German architect and the founder of Bauhaus, is considered one of the pioneers of modern architecture and buildings, he had a huge influence on modern architecture as an architect and as a lecturer as well, he was famous of being the founder of Bauhaus college for design in Germany.

<sup>1</sup> <https://www.lexico.com/en/definition/cladding>

<sup>2</sup> Al-Otiby Ahmed Aziz Hamouda “monitor and analysis of the features of local architecture of the southern region of Saudi kingdom” master thesis- faculty of engineering- Cairo university- 2002- p.5.

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<sup>4</sup> – sami , earafan (1987 m) , eamarat alqarn aleishrin , tbet khasatan , jamieat al'azhr- alqahr .s 789

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\* the Sassanid empire was the name of the second Persian empire 226-651 which was linked to the Zoroastrian priest Sasin who was the grandfather of the first Sassanid kings Ardashir the first, who established the Sassanid race after the defeat of king of the Parthian, the empire was over when the last Sassanid king Yozdoger the third 632-651 tried to resist the armies of early Muslims Khelafa for 14 years, the land of the Sassanid empire included Iran, Iraq some parts of Afghanistan and Armenia, all eastern parts of Turkey and parts of Pakistan, Sassanid called their empire Iran Shahr which meant supremacy of the Aryan Persians.

<sup>8</sup> Dr. Abd Al-Baky Ibrahim “the Islamic perspective of the architectural theory” center of planning and architectural studies.

\*\* Al-Sayed Hussein Nasr was born in 7th of April 1933- in the Persian capital Tehran- he is a contemporary Islamic philosopher who worked as a professor in Islamic studies department at George Washington university, he is a famous Persian philosopher who has many writings and articles, he was famous in the field of religion comparing, Sufism and philosophy of science and metaphysics, his philosophy included criticism and refusal for modernity and its negative effect on human spirit.

<sup>9</sup> Al- Baramby Hossam “the influential relation of the ornament on the shape of the heritage buildings in the Arab region” general association of tourism and national heritage, 2015.

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<sup>13</sup> Al-sayed Yassin- the civilizational dialogue in the age of globalization-Nahdet Misr-2002-p.31.

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\* john Harris is an English architect who (Al- Sheikh Zayed) the ruler of UAE has hired to start the modern architecture, he designed the world trade center in Dubai and Abu Dhabi embassy

\* ELSeed is a French artist who was born in 1981 in Paris, his two parents are basically Tunisians, he invented calligraffiti which is the mix between calligraphy and graffiti.

<sup>15</sup> Anna, seaman. Artist eL Seed reaches new -12 heights with huge calligraphic painting in Dubai. thenational. (2016). Retrieved November 12, 2018, from: <https://www.thenational.ae/arts-culture/artistel-seed-reaches-new-heights-with-hugecalligraphic-painting-in-dubai-1.180222>

<sup>16</sup> Reba Al-Aloush “analytical study for the features of glass curtain walls-local and international models” magazine of Al- Baath university- folder 36-issue no.1-p.5

\* The art of paper folding the Japanese origami, it is related to the Japanese culture, the modern use of the concept of origami is that it is a comprehensive concept for all types of folding despite the original culture, the idea is to transfer a flat paper into the final shape using all techniques of sculpting and folding, users of origami don't encourage the cut and paste or generally the making of any sign on the paper, professionals of origami mostly use the Japanese word craigami to refer to the design which uses the cut, though cutting is a feature of the Chinese paper manufacturing.

\* Shaun Killa studied architecture in Cape Town university, he gave awards for the winning companies in Cape Town then he moved to Dubai and joined Atkins in 1998.

<sup>17</sup> Islami, Seyed., Dehghan, Davood., Naeini, -14 Hassan. Classification and Analyze Stucco Decorations in Qajar Houses. Tehran, Iran, (2016).

<sup>18</sup> Hayam Mahdy Salama “Mashribya in the Islamic architecture between the originality of the idea and the modernity of the application” art and architecture magazine- issue 13-p.23.

\* Paul Andréa is an architect and road and bridges engineer, a previous student in the polytechnic school, he is the manager of architect and airport engineering in Paris.