

Designing Glass Facades Inspired from The African Arts. Applied on the president mansion in “Bioko” island in tropical Guinea

Dr. Azza Osman Ibrahim Bakr

Lecturer at glass department- faculty of applied arts- Damietta University.

azzaosmanbakr@gmail.com

Introduction:

The African art is a very unique art on it's own and has it's special style as it is a symbolic kind of art that gives deeper and bigger meaning as it is concerned with creativity and building something that is related to symbolism and simple expression in the innate human.

It is characterized with simplicity and stripping. We can't forget that the African art had a huge impact on contemporary and modern arts, many artists such as Gujan, Brac, Van Gough, Picasso were influenced by the African art, like most of the great artists did such as Cesar and Monet, they all agreed that the African art is unique on it's own and has it's special style. The African sculptors and masks revealed the simplicity in dealing with things and nature, where the African artist is always trying to do those things in a whole simplicity and stripping and his source is mother nature. African artist doesn't pay attention to the issue of light and ratio as his art doesn't interact with the shape as it tries to create and build something related to symbolism and simple expression in the innate human.

The African masks that was found is considered one of the oldest masks since the 5th century p.c. that art realized a wide fame in the artistic media, studies showed that this African mask existed for such an ancient time. Almost near to the 5th or 6th century P.C., as there are other masks that represent the beginning of the agriculture season and harvest places, which are popular masks for Africans to encourage farmers and workers to exert more effort. The African masks represent the African face where it shows the African features and elements that are related to the ancient African arts and other arts, through the mask the artist is trying to wear the antecedents' spirits and highlight the advices and old ideas to deliver them to the coming generations. Most researchers tend to consider the African art is the oldest fine and formative arts in history and prove that by some sporadic African tribes throughout Africa left artistic monuments that are shown in many sculptors and drawings on walls or flat rocks, the oldest of what was found from them in tropic Africa goes back to the 3rd century A.D.

The African arts still is a reflection of images of the identities that are related to the force of nature and facing the evil power, also the practice of living represented in handcraft, hunting, shooting and other humanitarian activities that are connected to the nature essence.

The contemporary fine art in Africa has started to find it's status among other unique and modern fine arts, and it is original not hybrid or intruder and it attracted the attention of who are interested from various artistic schools, for it's multiplicity and the richness of it's sources and ancient, original and various backgrounds. It has several characteristics that started to differentiate it from other European and American schools their old and modern ones. African art is characterized by it's multiple features and overall it is the result and the juice of various, different and very ancient cultures. Western artistic critics noticed that this art has it's own icons that represent it's background, as it is the sum of a very ancient civilizational combinations, and has its roots that are extended to the whole African societies their eldest

and most modern as well, many critics called that art many names as “the strange art” some called it “the magical art” as it is closer to the magical reality.

Key words: Design - African Arts – Architecture – Facades – Technology



Fig (1) the African art

The research problem:

How to utilize the aesthetics of the African art in designing creative glass murals that match with the hot* tropical climate of tropical Guinea and how to execute an artistic work that can hold on during such weather.

The research goal:

Making artistic designs for the mural in the president mansion at Bioko island in tropical Guinea that fits the African environment and achieve balance between environment and design with the appropriate technology.

To reach the goal and solve the research problem, those studies must be done:

First: study the concept of the aesthetics of the African.

Second: study the methodological steps of the operation of glass murals design and project the designing ideas.

Third: an applied study to get the research results.

First: study the concept of the aesthetics of the African.

The African art is an expression that include the arts of the whole continent, north, south, east and west, old and modern, with all what it includes of special, religious and ethnocentrism arts such as ancient Egyptian, Islamic, Coptic and Arabian arts or high and negro ethnicity and many more.

The African artistic works are characterized with simple and spontaneous style in formulating the visual vocabularies in transferring their special thoughts, and ignoring many details that they see them unnecessary or irrelevant to the subject. Often the forms are being dealt with a way that suits the nature of the matter and the magic of the thought, that what most of the

* it is referred to the equator between horizontal circles latitude 10th at the north and 10th at the south, where it is characterized with high temperature and heavy rain that fall through the whole year, the tropical forests are the most famous forests on earth for the amount of trees, animals, insects and birds, the most famous forests of them are the amazon river forests at the southern America continent, the reason of the heavy rain is due to the sun rays' straightness on it's areas from March to June, September till December, hence the rise of the evaporation percent which cause the continuous rain fall.

modern artistic directions did in the 20th century after putting all those natural values and magical necessities of the African art inside an aesthetical and scientific frame, making them modern and artistic values in the shape context of the artistic work through rebelling and getting out the traditional and academic rules as what is known as the modern concept. The simplest forms carry the biggest significances and meanings that have the most influences on affecting and expressing the idea and its contents. The African art in the continent west cared to a great extent to express that spiritual force and representing the spiritual essence of things in materialistic form through the sculpting works. There is no doubt that the religious and spiritual extractors are one of the motives that makes human looks for a way of expression that reflects his relation to life and existence by framing things within contexts that identify the form of their existence such as: similarity, identically and contrast cases. The first of those means are the simple materials that he obtains from his environment without any effort or suffering, though the simplicity of such materials but probably he tries to make them talk through manufacturing that doesn't lack the craft and many others can't achieve, that have certain technics in their simplest form, that spontaneity relates the natural artistic works to the artistic works produced by the first human in the ancient civilizations. If magic, legends, miracles and superstitions form the basic thinking rooted in the subconscious of the primitive human, the idea of the African ancient art came from that growing conscious from the folk of tribes, customs and traditions and social and religious ceremonies that was formed from the context of beliefs, images and intellectual and spiritual concepts where it showed the spirits of the ancestors and the natural phenomenon are the rings that this context of practices were formed from. Apparently it is important to point that the traditional African thought considers all the rings and the universal beings from the position of the human as the base and the center of the universe. Accompanied by such beliefs before and throughout all his life starting from his mother womb then his birth passing through his childhood then his youth, senility and death. Then the effect of the surrounding on the relation of the artist with life and existence that's how an idea is evolved attached to the reality and imagination without being separated by subjective or aesthetical barrier, as if it seeks to uncover magical solutions for that time by using multiple forms of spells that go all the way back to the ancient times. That means the that the curriculum of the African art tends to regain those vocabularies that are aroused from the primitive human nature with the same simplicity and spontaneity, among god, spirit, the holiness of the nature and ancestor the African art evolved as a way of communication between that African human and his worlds of beliefs so he created vows and offerings that represented the essence of life in the traditional African communities as a daily activity with artistic and aesthetical style that he practiced in the tribal community, as he can't differentiate between what is considered to be art and what is not, as he decorates pots that he eats in and beautify his house and his body with tattoos and dyes, wears jewels and dances through his sadness and joy, plays music to declare war, sings to express his feelings and passion and sculpts masks for his prayers and his religious rituals. Hence the study of the traditional African ceremonies is necessary a study for the communities' reality and their intellectual, spiritual and aesthetical values, the used materials for those works were not far from spontaneity and simplicity, as they are the closest materials and most relevant to the nature and environment but also the most capable to express the content of the idea and its core, as

the material is convenient to the simple and spontaneous dealings that the thought is characterized by them, among clay, rocks tree's wood and simple local textiles which are mostly the remaining of used and consumed materials, emerged those spells for a world full of symbols, signs and significances as simple magical ideas.

The next table shows some of the used symbols in the African art and their significances:





What it expresses	The literal meaning	The African name	symbol
It is the master of all symbols. Symbol of greatness, charisma and leadership. It shows the importance of playing a leading role.	Leader or chief	ADINKRA HENE	
A symbol for alertness, awakening It is a horn used to make the scream of the battle.	War horns	AKOBEN	
A symbol for courage and heroism. It was crossed swords. Represents an urban drawings for the of many countries' logo, swords also represented the country legalization.	War sword	AKOFENA	
The symbol of mercy, caring, discipline and nourishment. Also means parents to costume their kids on discipline not spoiling which represents the perfect example of parenting as it is a protective and corrective symbol for all what is happening.	Chicken leg	AKOKONAN	

Table 1 shows some of the used symbols in the African art and their significances

Second: study the methodological steps of the operation of glass murals design and project the designing ideas:

Design murals from glass mosaic and glass sculpting of the frontals of the president palace at "Bioko" island in tropical Guinea:

Architecture is the most important and oldest art and the most attached one to humans as it contains the human's life with all it's various images from the art of forming surfaces and masses for the purpose of creating voids that cause benefits and a particular artistic pleasure within the frame of an absolute, universal and natural system, the building is a living being

and a mass of feelings and emotions that are reflected by it's frontals, we can express a thing by primarily looking at it, so we can describe it's shape, color and use...etc. architecture as any other art is subjected to evaluation and criticism from the professionals of it's fields and the students of it's sciences, and it's users from the unprofessional and it is judged after watching and living or getting affected by it as a creative, regular or upsetting one. The things that characterize architecture and elevate it to the level of art are the compositions that are combined with each other forming the architectural context and it's physical unit, starting with the surface with all it's components from touch, color and ending with the shape with it's components from mass and voids, the field was clear to architectures to unlimited creations some are inspired from the traditions of the old art and some are inspired from the local traditions and most of them are identical to the modern art concept which cared about ratios and exceeded the sculpting and decoration as an aesthetical formula to the geometrical mass that is penetrated by holes, glass, function, comfort and color were given a huge attention in architecture which we are trying to confirm to create a unit that combines the features and aesthetics of modern architecture and the spirit of the African art which is ruled by special ideology, creed and vision. The thinking about making several designing ideas has started to utilize the African art through decorative, building and constructing elements.



Shape 2 shows the use of decorative units in the African architecture.

The philosophy in designing the mural that is concerned in the research:

The process of architectural design is a creative process as it cuts from the unlimited silent space through imaginary and real surfaces and shapes that comes back to life and through them, all masses, internal and external voids are formed, that are needed for cultural and material human's needs which move his senses and artistic feelings.

The glass architectural designer to start the level of creativity has to determine the intellectual and philosophical line to reach his goals in the design which carries the materialistic, scientific, beneficial and constructional concepts with his intellect that always aim to individuality to reach the artistic shape that matches the surrounding environment, based on that the philosophical directions are determined for the glass architecture design.

The philosophical intellect headed to design the architecture of borrowing from environment and harmonize with the general surrounding and with the receiver by imitating shapes from nature of things that the witness has always noticed around him, became familiar with it, enjoyed it and liked its beauty and composition and entered his memory forming the aesthetical units around him. Those works vary among absolute and relative judgments culture, place and time. On the other hand, the architectural formation theories of the human

stables rely on the progress process in the rising direction in an inevitable way as long as the human becomes more in control on the advanced technology in the raw and constructing materials, the possibilities, the modern building methods and caring about the manufactured transparent surfaces and use them in the environmental cycle expressing the advanced globalization in it's materials and the use of that materials in imitating the nature phenomenon or biology to represent clouds, mountains, waves and trees by attractive, advanced and fascinating materials in the shape, dimensions whether it is opaque or transparent. He started with plastic materials, glass and metallic bars as aluminum, stainless -steal, cupper, bronze and titanium. Such materials appeared strongly in the environmental architecture for their wide potentials in free artistic shaping.

The methodological steps in the process of designing the mural in the research:

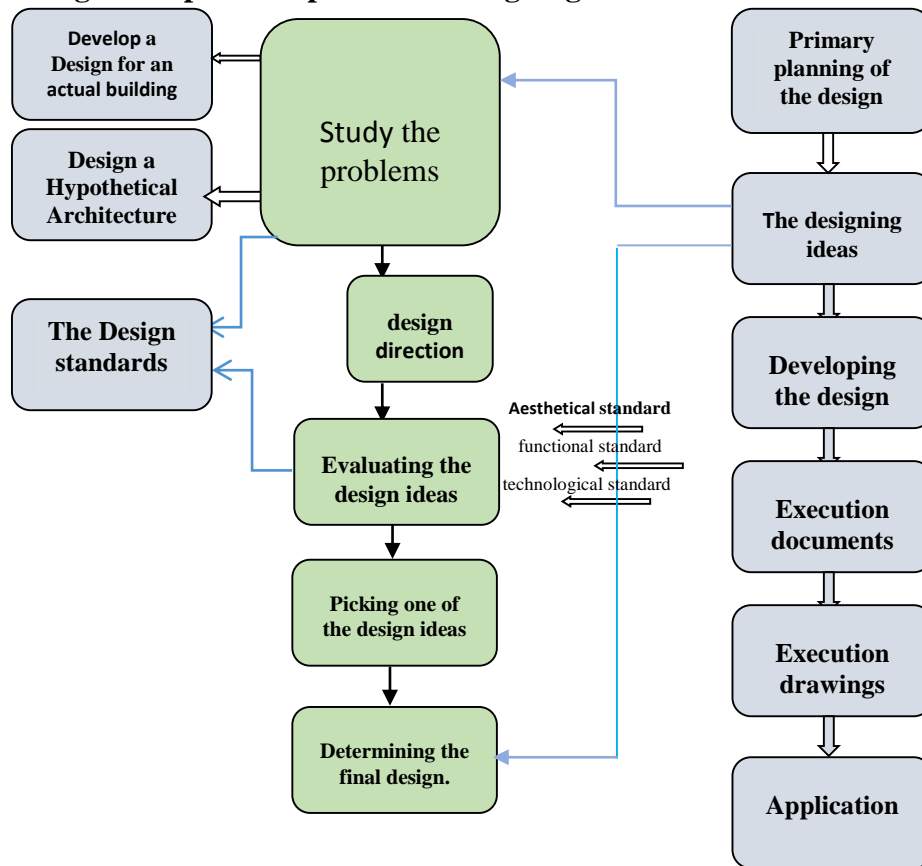










Fig. (3) Shows the methodology of the designing process for an architectural glass frontal.

The frontal is considered the outer shell of the architectural shape of a building and it is the separate wall between the inner and the outer as it is one of the important architectural hinges, the frontal contains a group of vocabularies and elements that are organized among each other forming the final special environment of the frontal. Next is analysis to some used units in the mural concerned in the research and chosen from the surrounding environment that is unique about tropical Guinea and the African art in general, here are some of them:

Analysis		The element after stripping	The element from nature
Color analysis	Shape analysis		
Using the total stripping technic in colors and dimensions, staying away from the subjective manifestation of colors as they are shown in nature.	The total stripping technic was used in designing the shape where the ratios and positions were changed to differentiate the shape from the natural one to produce a shape that is hard to be recognized but also keeping the main features from nature like strength and fierce.		The lion 
The total stripping technic was used in colors and staying away from the subjective color manifestation as it appears in nature.	The partial stripping technic was used to strip the form of the swan where the deviation was limited to the bird's wings and the head, it has become easier to differentiate it from it's natural match.		The swan. 

<p>The total stripping technic was used in colors and staying away from the subjective color manifestation as it appears in nature, and adding color in some circles that are surrounding the element and was added to serve the design.</p>	<p>The partial stripping technic was used to strip the form of the monkey, the strip was in the outline of the body to become resemble to some of the African embellishments but keeping some of it's main features in the basic form like the head, legs and tail to be easily distinguished from it's natural match.</p>		<p>The monkey.</p> 
<p>The total stripping technic was used in colors and staying away from the subjective color manifestation as it appears in nature.</p>	<p>The total stripping technic was used in designing the shape where manipulating the ratios and dimensions to distinguish the shape from it's natural match to produce a shape that is hard to be recognized but also keeping some main features like the trunk, the ear and the huge size.</p>		<p>The elephant.</p> 





<p>The African mask is the result of human creativity that is based on the spiritual link to the holy and symbolic recognition by the body in the ritual ceremony where strange, beauty and magical are mixed together. The total stripping technic in color was used and staying away from the subjective color manifestation as it appears in nature.</p>	<p>The various African communities produced rich and variable collection of masks that differ in their symbols and forms, there is the style that tends towards nature and reality which is usually a portrait for animal or human face, but in that design the researcher used another style where he relied on the total stripping and let go of the superficial extras to realize a stripping value, the face features are transformed to elements each is related to it's size and linked to the other elements by the general rhythm of the mask.</p>		<p>The face and the African mask.</p> 
<p>The full color stripping of the shape where black and white only were used to match the whole design.</p>	<p>Only the body language stays, it's shivering, silence and crazy dancing are a language that can screams, laugh, play, hate, resists fear and dullness. African people are the first to know the body language, specifically the dancing language and they are the first to Deeping the authority of that body. The partial stripping was used where the shape kept the human features from legs and arms so as the movement expressing the dance.</p>		<p>The dancing woman.</p> 

Table 2 shows an analysis of some used units in the mural in concern at the research that is chosen from the surrounding environment that is unique about tropical Guinea and the African art.*

* By the Researcher

The design was constructed based on the collective building concept by collecting the building units in one coordinated pattern to create various building constructions and combinations. The collective building system (Fig. 4) could be used in the following:

- 1- The possibility of separating the shape or the whole building units into partial coordinated units.
- 2- The possibility of diverging the combining alternatives to perform the special functions.
- 3- The possibility of future extension by adding new elements and units.
- 4- The possibility of renovation and replacement through the availability of building elements or alternative combining units.



Fig. 4-A line sketch explains the primary idea.

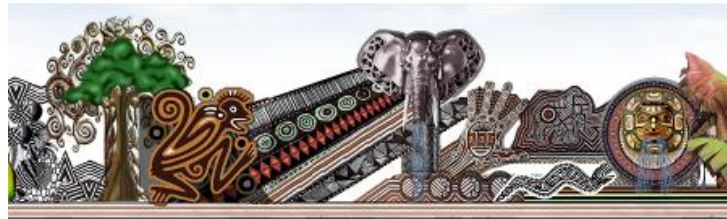


Fig. 4-B the colored design explains the used elements and units.



Fig 4 constructing the design

Third: applied studies.

The mural was executed by the **glass mosaic technic** and **glass sculpture**. Poly ester and glass strings that are heat resistant and water proof were added to show the artistic values with purity value in the formation and maintaining a cohesive sculpturing illustration with the glass strings till the voids between the painting and the back wall were filled through the pouring of concrete supported with adhesive materials.

Glass mosaic technic: A mosaic is a piece of art or image made from the assembling of small pieces of colored glass, stone, or other materials. It is often used in decorative art or as interior decoration. Most mosaics are made of small, flat, roughly square, pieces of stone or glass of different colors, known as tesserae. Some, especially floor mosaics, are made of small rounded pieces of stone, and called "pebble mosaics". **There are three main methods:** the direct method, the indirect method and the double indirect method.

The direct method of mosaic construction involves directly placing (gluing) the individual tesserae onto the supporting surface. This method is well suited to surfaces that have a three-dimensional quality, such as vases. This was used for the historic European wall and ceiling mosaics, following underdrawings of the main outlines on the wall below, which are often revealed again when the mosaic falls away.

The direct method suits small projects that are transportable. Another advantage of the direct method is that the resulting mosaic is progressively visible, allowing for any adjustments to tile color or placement.

The indirect method of applying tesserae is often used for very large projects, projects with repetitive elements or for areas needing site specific shapes. Tiles are applied face-down to a backing paper using an adhesive, and later transferred onto walls, floors or craft projects. This method is most useful for extremely large projects as it gives the maker time to rework areas, allows the cementing of the tiles to the backing panel to be carried out quickly in one operation and helps ensure that the front surfaces of the mosaic tiles and mosaic pieces are flat and in the same plane on the front, even when using tiles and pieces of differing thicknesses. Mosaic murals, benches and tabletops are some of the items usually made using the indirect method, as it results in a smoother and more even surface.

The double indirect method _which is used in this project _can be used when it is important to see the work during the creation process as it will appear when completed. The tesserae are placed face-up on a medium (often adhesive-backed paper, sticky plastic or soft lime or putty) as it will appear when installed. When the mosaic is complete, a similar medium is placed atop it. The piece is then turned over, the original underlying material is carefully removed, and the piece is installed as in the indirect method described above. In comparison to the indirect method, this is a complex system to use and requires great skill on the part of the operator, to avoid damaging the work. Its greatest advantage lies in the possibility of the operator directly controlling the final result of the work, which is important e.g. when the human figure is involved.

For the thermal insulation we used fiberglass and glass wool. For similar composite materials in which the reinforcement fiber is carbon fibers, see carbon-fiber-reinforced polymer. The

fibers may be randomly arranged, flattened into a sheet (called a chopped strand mat), or woven into a fabric. The plastic matrix may be a thermoset polymer matrix—most often based on thermosetting polymers such as epoxy, polyester resin, or vinylester—or a thermoplastic. Cheaper and more flexible than carbon fiber, it is stronger than many metals by weight, is non-magnetic, non-conductive, transparent to electromagnetic radiation, can be molded into complex shapes, and is chemically inert under many circumstances.

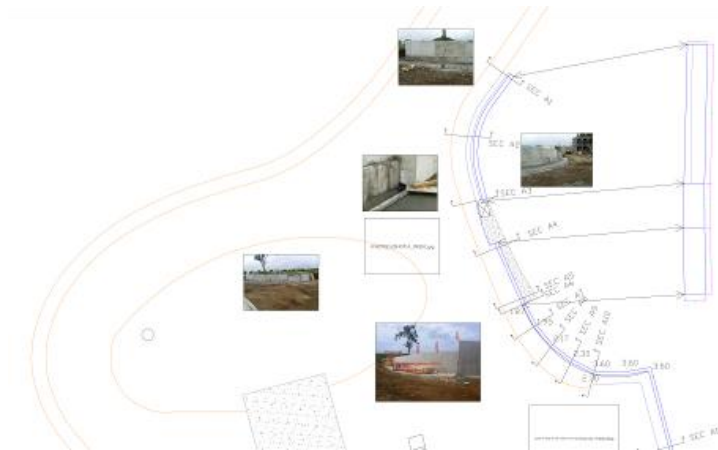


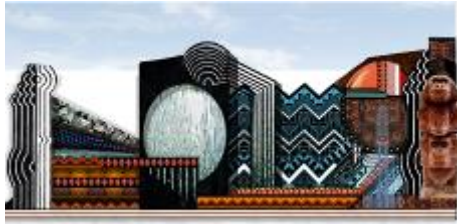



Fig. 5 a horizontal view of the mural in the research



Fig. 6 the concrete mural involved in the research.

The search results:

- The possibility of realizing the philosophy of the designing direction of the building in the content and the form with what fits the environmental surrounding.
- Realizing the designing intellect and the goal from using the building.
- Using the modern technics that fit with the environment to realize the design. Due to the weather and bad climate changes at Pico area in tropical Guinea.
- The basics of the architectural murals design were applied on the mural concerned in the research from rhythm, unity and balance as shown in the coming table:

The design basics	Application on the mural	Analysis
1-rhythm	<p>Fig. 7 the rhythm of the lines.</p>  <p>Fig. 8 the rhythm in bulks and levels.</p> 	<p>The rhythm was achieved by creating an organized collection from strings, levels, bulks, embellishments and colors that represent the architectural work.</p> <p>Through the lines rhythm (Fig. 7), levels and bulks rhythm (Fig.8).</p>
2-unity	 <p>Fig. 9 unity in the design.</p>	<p>The architectural work was elevated to an unified, continuing and integrated form to leave a visual and mental impression on the recipient or the witness that is clear of distraction or un-cohesiveness through the shape, texture and bulks unity using colors.</p>
3-balance	 <p>Fig. 10 balance in the design.</p>	<p>The most perfect example on balance and stability is the movement of the sky and planets balance, the balance and stability were realized by the constructional stability to stabilize the shape.</p>


4-Form and function.	 <p style="text-align: center;">Fig. 11 form and function.</p>	<p>The architect divided that point into 4 forms:</p> <ol style="list-style-type: none"> 1. Form followed by function from constructing view. 2. Form followed by function from the perspective of distinguishing the building. 3. Form followed by function from the perspective of light, shade and airing. 4. Form followed by function from the perspective of giving the required privacy <p>The second and the forth points were realized, as the first concern was distinguishing the building as it is the presidential building beside giving it the required privacy due to the political significance of the building.</p>
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Table 3: Applying the basics of the architectural murals design on the mural at the presidential palace in tropical Guinea.*

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