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Effect of Design Elements of Urban Space Coverings on Comfort Types (The Case of Jean Nouvel Dome in Abu Dhabi)

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ABSTRACT: The physical space that a person perceives with all his senses affects his behaviour and organizes his actions . The research problem is to reduce the conditions of the climatic environment that are not suitable for living (trying to reach thermal comfort) at the level of urban space by studying the elements of comfort - large solar radiation and temperature - (streets - squares - squares) , The aim of this research is to represent an attempt in the direction of reaching a methodology to achieve comfort in the urban space by developing in one of its elements (floors - walls - ceilings - elements of trees and outdoor furniture..) The ceilings will be developed in this study , The importance of the research proposal is summarized in the development of the roofs of the urban space , Research Methodology : This research deals with the definition of external urban spaces, their forms, their composition and the basic elements that define urban spaces, including verticals, horizons and ceilings, the evolution of the concepts of urban space and the foundations of dealing with it through the ages from the Pharaonic era up to modernity, the definition of the covered urban space and the reasons for covering urban spaces in the past, And the history of the emergence of the urban coverage of urban spaces in the past (in Arab cities and in ancient Egypt) and recently ,a classification will be made for the covered urban spaces (depending on the importance of the coverage - the construction system - the type of spaces ..) to reach the goal of urban coverage. **The results show Extracting the reasons for the need for urban coverings and finally the effect of using covered urban space coverage on achieving comfort AND The effect of design elements of urban space coverings on types of comfort.**

KEYWORDS: urban covered spaces , covered design elements , classifications of covered urban spaces.

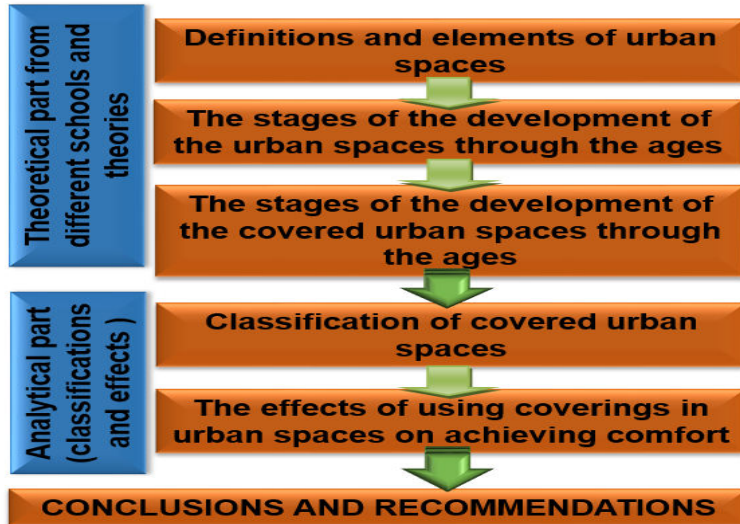
I. INTRODUCTION

Cities have turned into concrete forests, destroying their natural environment and urban spaces turned to spaces which have no comfort feeling inside , so the need to design according to the human dimension and scale in the design of open areas, taking into account the places of people inside them, and using environmental treatments to create sustainable spaces in them appeared to the stage in the last few years to achieve the human comfort with the urban spaces which they use .

1-1: Attempting to achieve thermal comfort and reduce the temperature in the urban space as the rise in the body temperature reaches 39 or 40 degrees, makes a person begin to feel fatigued, and if the temperature rises above 41 degrees, the body's functions begin to stop, and the researchers discovered that living The extreme fluctuations of the weather, all over the world, raise the level of pressure and increase it cramping. The high temperature has an effect on the productive capacity and behavior, so it was necessary to address the high temperatures in the urban spaces used on a daily basis.

II. METHODOLOGY

The research methodology is based on the existence of an inductive theoretical research approach that includes definitions, origins, and an analytical approach to extract a table to classify the covered spaces according to the type, areas covered, and the structural system used, and then reach the goal of achieving thermal comfort in the urban space.



The methodology is divided into 3 parts ,Theoretical part from different schools and theories (definitions and elements of urban spaces – the stages of the development of the urban spaces through the ages – the stage of the covered urban spaces through the ages , Analytical part – classifications and effects – (classification of covered urban spaces – the effects of using covering on urban spaces on achieving comfort) and conclusions and recommendations

Fig. 1. Research methodology

III. THEORETICAL PART FROM DIFFERENT SCHOOLS AND THEORIES

The theoretical study aims to present and introduce the concepts of the covered and uncovered urban space, the reasons for using urban coverings, and the evolution of the construction of covered spaces through the ages.

3-1-DEFINITION OF URBAN SPACE :IS THE PLACE THAT CONTAINS THINGS, PEOPLE AND ACTIVITIES THROUGH ITS THREE DIMENSIONS. IT ALSO HAS A CHARACTERISTIC OF DEVELOPMENT OVER TIME, WHETHER URBAN DEVELOPMENT OR HUMAN DEVELOPMENT (AND HUMAN DEVELOPMENT HERE MEANS BEHAVIOUR, ACTIVITIES, MOVEMENT AND EVERYTHING RELATED TO MAN’S BEHAVIOUR) 1.

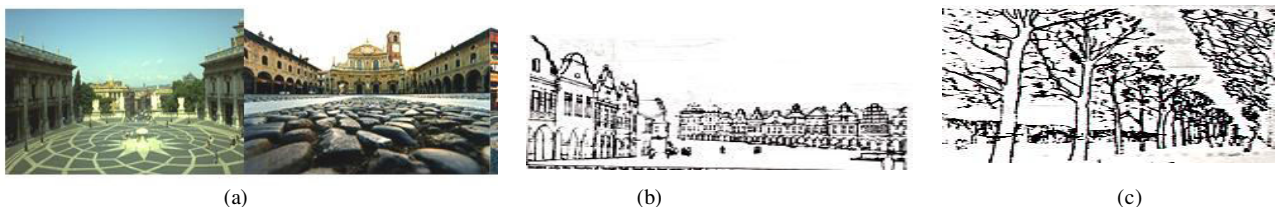
3-2-Elements and determinants of urban space :

3-2-1-Elements : The physical environment: gives the urban space its own shape and character, which are (walls - floors - ceilings - natural elements - furniture and details).

- For the human being: and everything related to it in terms of activities, behavior and actions within this urban space.

3-2-2-Determinants of urban space : It is represented in the building blocks - the walls - the coordination elements - the end line of the facades²

Fig.2:(a)Lower horizontal limitation (flooring): The lower limitation appears in earth and water , (b) Vertical limitation (surrounding building blocks)³ , (c) Top limitation (ceiling) : Facade end line with sky and tree branches.



3-2-3-Definition of covered urban space :(Yoshinobu) 1981: “It is a space formed by a frame to define a part of nature, and it is a semi-roofed space whose coverage is formed from natural or industrial elements that is formed by the reciprocal relationship between man and the things he perceives 4.The ceilings are the ones that define the space from the top where a ceiling can be added to the space or part of it for the purpose of determining the space or to give it a

¹Ashihar. Yoshinobu –“Exterior Design In Architecture”-Van NostrandReinhold.New York .1981 p 14

²Salingeros,N.: Urban Space & Its Information Field . P.3

³Bacon,E. : Design of Cities . P23 - 24

⁴Ashihar. Yoshinobu –“Exterior Design In Architecture”-Van Nostrand, Reinhold.New York. 1981 p (14)

specific scale or a special character or for protection. The void can be defined by light elements, and as soon as it fades, the void disappears⁵.

3-3-Reasons for covering the urban spaces⁶ :

- 1- The effect of global warming, which is the increase in the temperature of the Earth's atmosphere, which led to climate change and a significant increase in temperature in recent times - in the cases of coverage, temperatures drop 4 degrees Celsius .
- 2- Strengthening the user's mental image of the urban space
- 3-Increase the proportion of shadows in the space to help the user reach a sense of comfort in the space
- 4- Avoid direct solar radiation in hot areas
- 5- Adding different uses to the urban space after covering it, thus adding an economic dimension to the space .
- 6- Separating the space and determining its activity from the rest of the space that is not covered.
- 7- Utilizing the shadow element to improve the thermal performance in the spaces .

3-4-The historical development of the covered urban spaces, in the past and present:

The shapes of covered urban spaces differed over the ages according to the different use (as the areas and heights of the coverage differed) and the building materials in each era, and the need to cover the void was to improve the thermal performance of the space .

The urban spaces covered in the past were classified according to the coverage methods of each urban age and also according to the type of covered space (roads - squares - cities - squares - markets ...) and the spaces and widths of the spaces that will be covered

3-4-1-Classification of the old covered urban spaces according to the type of space is divided into:

1-Covered traffic lanes (for pedestrians and cattle) with widths ranging from 4 m to a width of less than 8 m.

A 6 m wide path :fig.3: covered traffic path

A 8 m wide path :(a) The arches of the streets of Syria (Old Damascus) and in Andalusian cities between two houses to



(a)

(b)



create a small house with a covered urban space below which the temperature is lower. (b) The idea of the Sabbat was used in traditional Islamic architecture, especially in regions with a hot desert climate, when there is a relationship between the inhabitants of the two houses that are linked to each other as in the streets of Shali village in Siwa, Egypt and the town of Ishaqir in Saudi Arabia.



(a)

(b)



(b)

(d)

fig.4: covered 8m width path (a)Tightly braided mats between the building façades and reinforced with wooden beams in an African village .

(b)Canvas movable umbrella Seville, Spain

(c) Wooden trellises and climbing plants (movement paths in the Qumairineighborhood of Damascus)

(d) A tent-like system is tightened on ropes that connect the two buildings, tight between them, with leather or cloth, in the old streets of Bulaq , Cairo to reduce the temperature and limit the solar radiation falling on the vacant floors and the building façades .

⁵Ashihar. Yoshinobu –“Exterior Design In Architecture”-V N.R.New York. 1970

⁶www.pps.org/

2- Commercial streets covered with a width of more than 8 m.3- Commercial yards covered.



Fig.5: Urban coverage of the former Al-Radwan Kasbah, which is almost covered with upper openings to control the percentage of light inside the space at the bottom

Fig.6: The yards of the Al-Darb Al-Ahmar market in Cairo were covered with wood, and transverse beams were installed with props on the facades of the side buildings to carry the coverage

The phenomenon of roofing the streets – 6 : 8 m- , which includes the markets on both sides of them, was associated with the protection of a certain quality of goods such as silk and other fabrics. It was famous in many Islamic cities and was known as the sheds, such as the Radwan shed in Cairo (Khiamia Market)

Fig.7: Coverage in cities of an Islamic character: (a). Flat against the roofs in Andalusia (b), where brick vaults and two thresholds of wood and grapes were used, while Aleppo used stone cellars (c)⁷.



3-4-2-Covered urban space according to their appearance in each urban age : The shapes of covered urban spaces differed from one era to the next according to the different building materials, use and areas to be covered as follows:



(a)



(b)



(c)



(d)



(e)

3-4-2-1- Pharaonic era : The space is semi-covered in the Valley Temple of King Khufu A half-covered roof for work, a building of stone like girder, resting on the huge columns of the temple yard to work to increase the proportion of shadows

3-4-2-2- Greek era: Covered walkways surround the Great God Hall that separate the building from surrounding buildings .

3-4-2-3- Islamic era : Public market are fully covered Some roads (streets and pedestrian paths) between adjacent residential buildings are partially covered , Use the tents system, which is a thick type of cloth that resembles leather that is tied by ropes over the goods to protect from the sun , Stone arches were used between buildings to increase the internal spaces and using them externally as covered paths , Wood was used to cover some pedestrian paths, as in Old Cairo and Sabbat in the oases.

Fig.8: covered spaces in past urban ages : (a) The space is semi-covered in the Valley Temple of King Khufu ,(b) One of the Greek temples, its side aisles covered the extra ceilings of the building. , (c) Use wood to cover the paths in Old Cairo , (d) shaded paths below in one of the Heliopolis buildings on El Korba Street , (e) streets and squares used in the Tree Museum in Tuhai, China

Measurements of the wind speed were made under the sapat that connects the two domains of what is known as the House of Cradleia with the Plateau of Shukr in Cairo, so it became clear that the sapat is a component of the prevailing winds moving due to the force of the wind pressure (the north-eastern wind averages 0.8 m / s) and in

7 Al-Nahhas - Osama (no date) - Desert Architecture - Cairo - P. 215



moments of silence the prevailing winds are active Reverse western currents in the opposite direction, exceeding them in speed (2.5 m / s) due to the opening of the passage under the sabat to the external courtyard of the Ibn Tulun Mosque on the western front.

3-4-2-4- The Renaissance :The shaded chambers from the projection of the buildings were used to determine the part of the pedestrian walk and separate it from the rest of the sidewalk and to add part of the shadows on the storefronts and reduce the heat

3-4-2-5- MODERN ERA :COVERINGS APPEARED IN SQUARES, WALKWAYS, STREETS AND SQUARES , THE TYPES OF COVERAGE VARIED AND RELIED ON THE USE OF CONTEMPORARY TECHNOLOGY IN ORDER TO WORK ON TREATING THE TEMPERATURE ESPECIALLY IN HOT REGIONS AND TAKING ADVANTAGE OF THE RAIN .

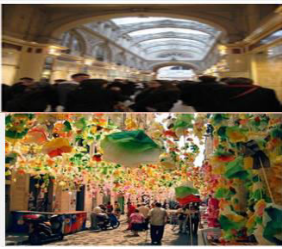

IV. ANALYTICAL PART

The analytical study aims to present and present a scientific methodology for raising the efficiency of urban spaces to achieve thermal comfort within them. An analytical methodology is formulated based on the outputs of the previous table and then applied to the selected study sample as a tool to evaluate and measure the extent of success



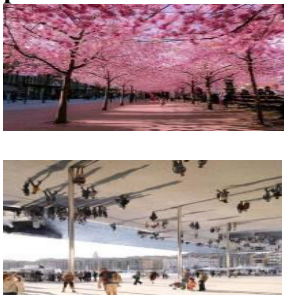

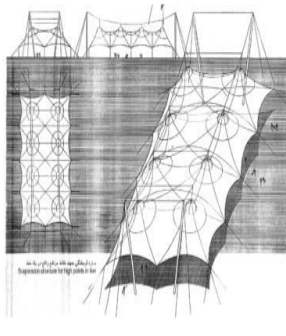


The proposed methodology, through monitoring and analysis of the extent of success of coverage, to raise the efficiency of protection within the urban space.

4-1-Classification of urban spaces covered:The classification of the covered space depends on several points, namely: the size of the services that the space provides to the user, the importance - classification - of the service provided, the ease of access to it and the perception of its features ⁸.

Table (1) that follows shows classification of the covered spaces.

Spaces classification	Characterization of the covered spaces	Height and building materials for coverings
<p>General and Private Landmark covers of public space Coverings that cut out part of the space in a semi-general vacuum to add a percentage of shadows. In a private space, lightweight wooden cladding is used - In a semi-private space, part of it is covered and left over</p>	<p>-General space: a space in which there are no obstacles to vision - Semi-general space: a space in which there is a vertical or horizontal limiter that separates the vision from the rest of the surrounding space -A special space: a space defined by coves, walls, or bushes with limitations that impede communication with the external total space. A semi-private space: a specific branch of a park that does not obstruct the vision</p>	<p>- The heights in public and semi-public spaces are large to be used as a distinctive sign. Modern building materials are used (metal structures covered). Mechanical control can be used to open and close windows. - The heights of special and semi-private spaces are 3-4 m high to suit individual use and building materials are made of wood, reinforced by rust-resistant metal hinges, and glass is also used to control ventilation</p>
<p>Classification according to the functional and social basis</p> 	<p>-Urban squares: squares with a cultural and historical dimension in which a grouping takes place, with coverage that reflects culture -Commercial squares: covered squares to preserve goods and shops, and some streets cover commercial squares with some distinctive trademarks. - Social fields: areas covered for community celebrations or designated for the use of the elderly and children</p>	<p>-In urban squares the elevations are huge and building materials tend to use stone with metal structures. -The coverage is higher than urban squares, and building materials use modern technological materials and are often covered with crustaceans and glass - The height of the coverage in the social fields ranges between 3-4 m to suit the human scale, and the building materials are from the surrounding environment</p> 
<p>Classification according</p>	<p>-Covered streets: covered with cellars,</p>	<p>- The heights of the streets range from 3-4</p>

⁸Kienast et al ,2012 ; Zhang , chen , Sun ,Bao , 2013

<p>to the foundations of the shape</p> 	<p>some of which are cancelled by partial coverings that are concentrated on the tops of buildings and there are streets covered with glass crustaceans</p> <ul style="list-style-type: none"> -Covered squares: some of them are used by Landmark in covers or using a tent system or using vacuum covers to clear the air. -Covered yards: some of them are completely covered with domes or glass crustaceans with metal, and some are covered in organic forms 	<p>m, and others are the highest buildings and building materials of light and hollow meanings, treated cloth and plant climbers.</p> <ul style="list-style-type: none"> - The heights in the fields are large to distinguish the space and the building materials are from the pump structures, metal or stone, and treated cloth is used in the case of tents -Yards have less heights than squares and use materials from surrounding environment. 
<p>Classification according to the ecological and plant elements</p> 	<ul style="list-style-type: none"> -Use of colourful floral vines to cover pathways - Use of shading in huge trees to separate the use from the rest of the space and shading. -Use covers that respect the surrounding environment -Use covers that help reflect the beauty of the surrounding environment. 	<ul style="list-style-type: none"> -The heights in the case of climbers are 3 m, and the materials are made of reinforced wooden arches and colored vegetable climbers. - The heights in the case of trees depend on the length of the tree itself because it is the component of coverage - The heights in the case of the reflective coverings of the surrounding environment reach up to 5 m. Building materials are metallic with reflective surfaces.
<p>Classification according to construction systems</p> 	<ul style="list-style-type: none"> - Spaces used for covering the tree structure system. It is similar to trees in shape and design. There are many shapes, including hollow and solid. - Spaces covering the tents method (simple - multiple pillars - wavy surfaces) 	<ul style="list-style-type: none"> -TREE structure: Height is 4.5 m above the ground, including fixed pillars, and building materials are wood or metal structures - The tents system has different heights due to irregularities in the surface shape, the building materials are treated cloth and metal structures. 

4-2-The effect of using coverings in covered urban space on achieving thermal comfort :

The actual success of the design of any urban space is related to its ability to achieve its desired goals, and its ability to absorb and attract users, while maintaining their sense of comfort inside it, so some environmental treatments were used in the urban space to achieve the greatest amount of comfort in it to attract the largest number of users and to give it economic importance⁹¹⁰.

⁹Lisney , Adrian and Fildhowse ,Ken ,Landscape design Guide , Volume 1 Soft Landscape , Gower publishing company limited ,1990 .
¹⁰Gehl ,Jan, Life between buildings , Using public space , Van Nostrand Reinhold company , 1980.

Table (2) that follows shows elements to achieve thermal comfort .

Cover heat transfer elements	Elements to achieve thermal comfort (Heat - humidity - rain wind)
Form of coverage	The shape of the coverage affects the amount of rain shielded from the ground, and the shape is designed according to the direction of the favourable winds
Cover colour	Black surfaces absorb heat, so the darker surface becomes hotter, but the white colour reflects the light, which leads to less heat absorption.
The shape and proportion of shadows	The ratio is affected by changing the angle of inclination of the coverings, which leads to a change in the moisture ratios produced on the surface of the earth under the coverage, which makes it affect the temperatures in the covered space
The ratio of openings in coverage	The temperature and humidity under the coverage are affected by the increase in the openings ratio by the urban coverage Increasing the number of openings allows a greater amount of rain to pass into the covered space The wind direction must be taken into account, as unpleasant winds are avoided
Structural details	The thermal transition varies according to the different type of material involved in the design of the covering, as the properties of good materials reduce the thermal transfer, which limits the humidity ratio, there are structural details that help drain rain water in a way that can be preserved, the choice of the structural system depends on the strength of the wind in the urban space
Building and flooring materials	The thermal transferability of the materials used is affected by the temperature. The higher the temperature and the thermal transferability, the vacuum acquires higher temperatures, taking into account the presence of moisture-insulating materials. Dark-coloured materials, such as asphalt and concrete, absorb more heat than marble. There must be rainwater drains to use for drinking or irrigation.

4-3-The effect of using coverings in covered urban space on achieving visual comfort :

To achieve visual comfort, the following must be followed when implementing urban coverage:

- The overlapping of geometric shapes: the use of urban coverings that contain overlapping and repetition of geometric shapes that work to dislodge light in the urban space below it, which reduces the level of dazzling and creates a social space that has many uses¹¹
- Lighting distribution: the use of urban coverings that distribute the lighting in an orderly manner in the space below it, separating the places of shade from the light and helping to reach the light comfort in the urban space.



Fig:9: Lighting distribution resulting from the use of urban coverage in the urban space in the squares of the American University in Cairo

- Shadow places: the use of urban coverings that provide shadows and do not block the view to ensure the right of users to enjoy the surrounding environment.



Fig :10: Urban coverage of the shore of the Spanish city of refuge Palmeral de las Sorpresas, Malaga, Spain does not obstruct the view of the sea view

¹¹<https://www.fosterandpartners.com/ar/news/archive/2007/11/the-smithsonian-institution-courtyard-opens-to-the-public/>

- Covering colors: Take into account the use of light colors in the coverings that reflect the light falling on it, so it preserves the space below it from the occurrence of glare and works to distinguish the shape of the covered space



Fig:11 : Silver white covers to reflect the solar radiation in Masdar City

From the above, we conclude that the environmental treatments that are used in the urban space are to improve the resulting environmental impact, and among the most important aspects of that environmental control are:

- 1- Shade control to provide thermal and visual comfort
- 2- Control the vacuum temperature to maintain thermal comfort
- 3- Take advantage of rain water
- 4- Maintaining the movement of air inside the vacuum

In order to achieve these previous goals, the environmental impact of urban coverage must be reached by analysing the performance of the urban space thermally, which depends on several elements, which are the variables of thermal performance:

Coverage shape - building material and construction type - height of coverage - area covered - electromechanical additions to improve coverage performance - ratio of holes to be covered - colour of coverage used The angle of inclination of coverage as shown fig 13

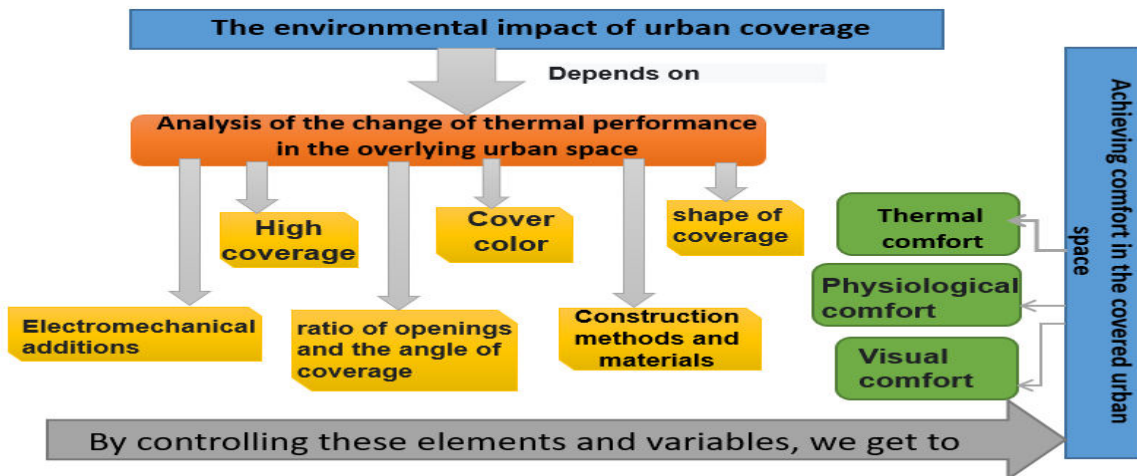


Fig.12 : Achieving comfort in the covered urban space according to the environmental impact resulting from the coverage

Most of the modern applications of urban coverage are inspired by nature in an attempt to expose the urban site to the principles of sustainability, and to try to link the urban space with the surrounding environment to confirm the user's mental image on the space .

From the foregoing, it can be deduced how to reach comfort in the covered urban space using the environmental impact, by:

1. Define the features and elements of the urban coverage assessment.
2. Measuring the effect of each of them on the thermal performance of the covered vacuum.
3. Determine the environmental impact through the thermal effect of each feature of the urban space coverage.

From here, a methodology for evaluating similar examples can be deduced - The Dome of Jan Novel Abu Dhabi - the case study by research

4-4-The methodology used to analyse the urban experiences of coverage:in the applied example we will set the project name first , then locate the project and it's importance ,then we start our analysis by introducing the project and

explain the used coverage features then we will describe the design idea and the construction methods ,then we explain the environmental impact from using the coverage in the project and how we can reach the comfort in the covered urban space in the project as it shown in fig.11 .

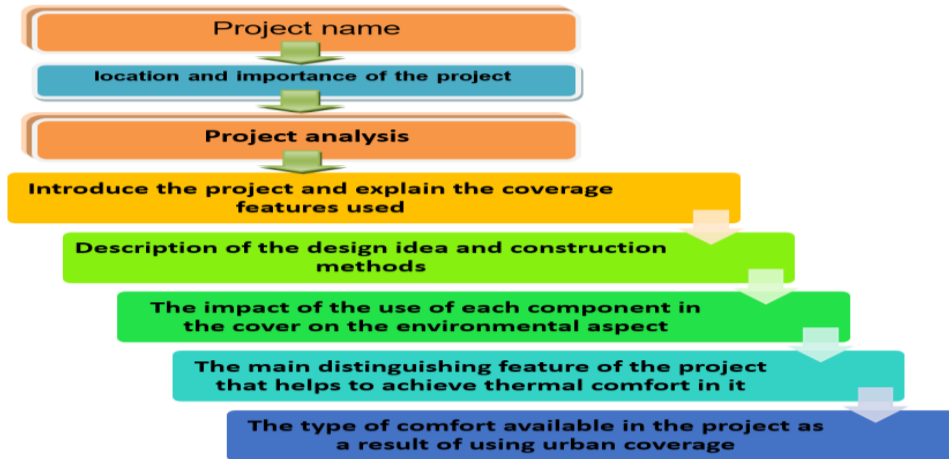


Fig. 13 :The methodology used to analyse the urban experiences of coverage

4-5-Factors for selecting the sample of the analytical study :

The study sample was chosen to evaluate the success of the proposed methodology for evaluation based on previous classifications of urban coverage in different spaces to raise the efficiency of thermal comfort inside that space:

- 1-The project is distinguished in terms of designing a dome taken from the heritage.
- 2-The design fulfilled the user’s need inside the vacuum and worked on the lighting levels afterwards
- 3-The structural method of the metal structure influenced the achievement of comfort inside the space

4-6-An applied example of urban coverage: The Jean Nouvel Dome in Abu Dhabi (shades 55 separate buildings):

Importance of the project: The project is an application of the principle of respect for the environment and an emphasis on the importance of the economic aspect of establishing urban coverage of space.

4-6-1-Project location: Abu Dhabi - United Arab Emirates

4-6-2-Architect: Jean Nouvel.

4-6-3-The design and construction idea: It is inspired by Arab engineering, as it consists of a complex structure consisting of 7850 stars repeating in different sizes in 8 layers on top of each other through which the light solar rays flow, which is known as (the ray of light), and the rays of the sun enter through them through openings reminiscent of the flow of light. Among the serrated leaves of palm trees ¹².



Fig.14 : The construction method used to raise the layers of the dome over buildings and streets

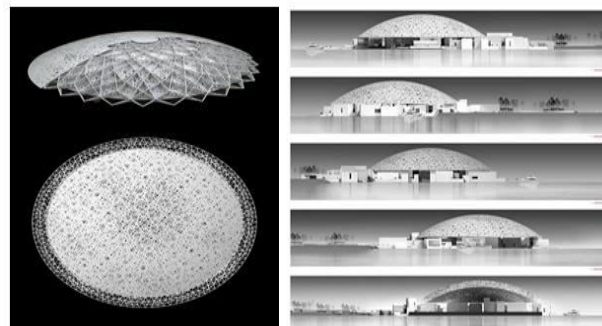



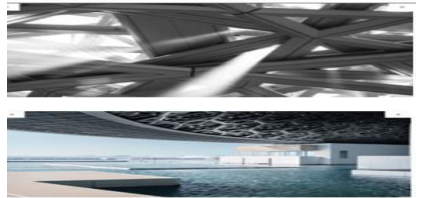

Fig 15 : The dome that covers the museum buildings and the layers that make up them, and places where the sun’s rays can enter from them ¹³ .

¹²<http://www.jeannouvel.com/en/desktop/projet/louvre-abou-dab>

¹³<http://www.agencefrancemuseums.fr/ae/le-louvre-abou-dabi/le-projet-architectural>



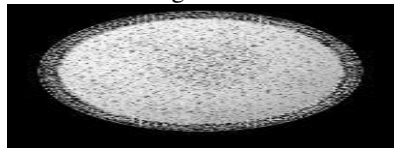

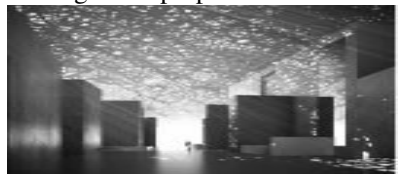
Fig.16 : The contrast between the shadow and the light resulting from the presence of urban coverage by the emptiness (called the ray of light)

<p>A huge dome that seems to float over the entire museum city, looks like it is lightweight, although it actually weighs 7,500 tons, the same as the Eiffel Tower in Paris.</p>	<p>The construction material for the monumental dome appears through the seams and seams, and also through the interstitial spaces of the covering .</p>	<p>The dome is in harmony with the surrounding environment at the level of the general site and was painted in a light colour to reflect incoming solar radiation to work to reduce the temperature in the space below it .</p>
		
<p>Fig .17 .shape of coverage in the model simulating the shape of a dome and placing it over buildings</p>	<p>Fig .18 .Construction material for the dome and the method of stacking the formed star layers together ¹⁴</p>	<p>Fig .19 . shows the white colour of the used cover</p>

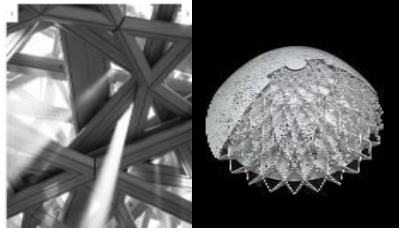

Implementation of what was reached in Table (3) :

- The construction system and the height of the coverage were affected by the covered area
- The color of the coverage is affected by the surrounding climatic factors (light to reflect the radiation)
- The effect of the openings ratio on the feeling of comfort inside the covered space.

According to table (2) that follows shows elements to achieve thermal comfort .

Cover heat transfer elements	Elements to achieve thermal comfort (Heat - humidity - rain wind- SHADES RATIO)
<p>Form of coverage</p> 	<p>The shape of the coverage led to a decrease in the thermal gain inside the vacuum, the shape of the dome led to a decrease in the thermal load by refraction of the incident solar radiation, the shape of the coverage led to an increase in the proportion of shadows in the covered space, the shape resulted in the appearance of a discrepancy in the light and shadow between the covered spaces</p>
<p>Cover colour</p> 	<p>The reflection of the incident radiation as a result of using the white colour makes the surface not absorb the heat, the use of a light colour to reflect the radiation, the light color increases the illumination inside the space and gives a sense of breadth</p>
<p>The hight and proportion of shadows</p> 	<p>The discrepancy in the height of the ceiling (the shape of the dome) reduced the heat load by refracting the solar radiation falling on it. The dome in the roof covering led to the distribution of the shadows in the side spaces in a greater proportion than the middle area of the void. The height of the coverage in the central area as a result of the shape of the dome led to a weak The proportion of lighting in this area .</p>
<p>The ratio of openings in coverage</p>	<p>The ratio of the openings resulting from the successive layers of the cover worked to reduce the temperature in the covered space, which led to the</p>

¹⁴<http://www.jeannouvel.com/en/desktop/projet/louvre-abou-da>

	<p>reduction of the humidity inside, the openings between the structural elements of the cover introduced to the fracture of the solar radiation falling on the floor of the covered space. The inside of the void, the presence of a number of layers with coverage to increase the proportion of shadows as a result of reducing the proportions of the openings in them, the layers of coverage and the internal openings between them produced what is called a ray of light while maintaining the absence of dazzling the eye</p>
<p>Building materials and construction system</p> 	<p>The presence of a number of successive layers from the units to reduce the thermal load on the roof and create a metal structure equipped with a heat-insulating material. It works to reduce the temperature inside the vacuum, the presence of a vacuum between the layers of coverage led to the cooling of the air entering the vacuum, and a metal building material was used to withstand the rapid movement of the winds in the surrounding urban space. Not to dazzle the eye.</p>

V. RECOMMENDATIONS AND CONCLUSION

From the above, we conclude that the factors affecting the achievement of thermal comfort below the coverage are proportional to some elements of the coverage in a manner that results in direct or opposite proportional relations. The relative importance of each of the distinctive features of the coverage can also be arranged with the addition of some new characteristics to it to improve its thermal performance.

It can also be concluded that the use of urban coverage has several advantages, the most important of which are:

- 1-Working on a sustainable design that takes into account the user in the vacuum and provides him with thermal, visual and optical comfort
- 2-Taking advantage of the contrast between shadow and light to work on showing the composition used by covering the floor of the void
- 3- Integrating local building materials with technology to work towards creating a sustainable product that takes into account the environment in it and maintains the limitation of solar radiation reaching the space below it
- 4-Integration of modern technology and parametric design methods with the ancient forms of cladding to come up with a product that is familiar to the eyes of users of the space and is in line with the technology of the times
- 5- Simulating nature in the form or business idea to limit the arrival of solar radiation to the ground and reduce the thermal loads on the roofs of buildings.

VI. CONCLUSION

We have implemented an automatic text detection technique from an image for Inpainting. Our algorithm successfully detects the text region from the image which consists of mixed text-picture-graphic regions. We have applied our algorithm on many images and found that it successfully detect the text region.

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