
Environmental trend in the design and development of Egyptian cultural centers including Complies with sustainability

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Abstract

In light of the global challenges to preserve the environment in its comprehensive concept and the recognition of the whole world of the importance of linking economic development and sustainability, the designer warns that he must meet current needs without compromising the ability of future generations. In addition, play a pivotal role in building the culture of generations.

The designer must pay attention and monitor the changes of civilization to link cultural heritage and modernity at all levels.

This paper aims to analyze the methods and concept of environmental design as a gateway to the principle of sustainability, as well as to devise new environmental solutions to improve performance and visual vision reflected from eco-design methods emanating from our civilization in the Egyptian cultural centers.

Keywords

Environmental Design -Sustainability –Culture

Introduction

Statement search problem:

Determine the role of environmental design in providing an internal environment that meets the functional requirements of cultural centers in Egypt by activating sustainability to reach high efficiency.

Research importance:

The importance of the research is due to the study and application of environmental systems that develop the environmental interior design of cultural centers in Egypt in the light of contemporary to achieve sustainability.

Objective:

Introducing new design systems and methods through the application of environmental design concepts to identify the place identity from the perspective of modernity and raise functional efficiency.

Research hypotheses:

The research assumes that environmental design achieves the design possibilities and advanced methods to reach interior environmental designs that support the requirements of cultural centers.

Sustainable Environmental Design

1.1. What is sustainability?

Sustainability: is the development that meets the needs of the present without completing the ability of future generation to meet their own needs (world Commission).

1.2. Sustainability definitions

Sustain: Lifelong support, continue or maintain.

Sustenance: The process of providing life or sustenance, food or nutrition.

Sustainable: A recipe describing something that has been given support, comfort, food or be alive.

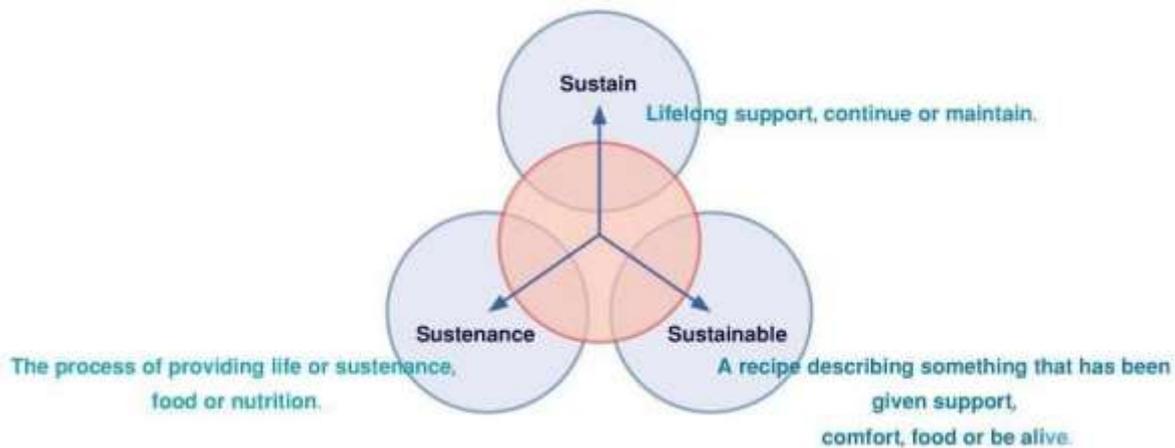


Fig.1 Sustainability definitions

Sustainability is therefore a concept that we should leave the Earth in a good or better situation for future generations than we found it for us. However, in recent years, more and more opinions have asserted that sustainability also requires a cultural dimension. Really that it is now as part of the very definition of sustainability is due to culture's role as a connection for human interaction.

2- Culture in the sustainable development:

2.1. Strengthening culture and its role in society challenges

Culture is an important foundation element, not just for society's existence, but for ensuring that it develops. This is perhaps culture's most significant contribution to a sustainable society.



Fig.2 Culture is a part of Sustainable Development

2.2. Culture as ecosystem

Sustainable cultural development requires all organizations, active in all art forms, representing various aesthetics, trends and design, etc.

The equal value of different forms of expression and knowledge, including environmental knowledge, should be recognized support for the most environmental elements to promote sustained in inclusive and sustainable economic growth.

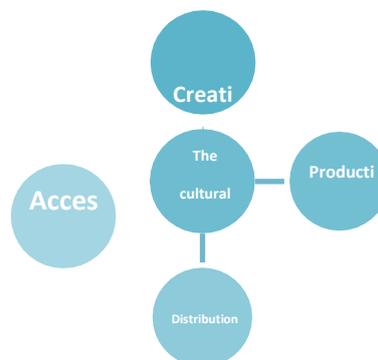


Fig:3 The cultural value chain

2.3. Culture Goals:

Culture Goals	How is culture relevant	What can designer do	we make this effective - some examples
	<p>Cultural services are basic services and equal access to them should be guaranteed for all. Cultural expressions, services, goods and heritagesites can contribute to inclusive and sustainable economic development.</p>	<p>Ensure that minimum service standards for basic Cultural services exist, so that everyone has access to culture. Integrate cultural aspects, and the preservation of cultural resources and capacities, in local economic and resilience strategies, which should also engage local communities</p>	<ul style="list-style-type: none"> - In Barcelona, the “Creators in Residence” project has enabled secondary schools to develop partnerships with artists and creative groups in a range of art disciplines, involving students in creative processes and fostering access to culture for all.
<p>Educational programs at all levels need to integrate contents related to cultural diversity, arts education, languages, and the role of cultural aspects in sustainable development.</p>		<ul style="list-style-type: none"> - The Arena da Cultura- Open School for the Arts in Belo Horizonte, has provided access to quality arts education in a wide range of disciplines for thousands of citizens and has paved the way for new professional careers in the cultural field. - In Bogotá, a range of initiatives have contributed to enabling access to culture for tens of thousands of children and young people through school and 	

			<p>out-of school activities, with positive social and educational results.</p>
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2.1. Culture Center Process

There are a variety of methods that can designer use to conduct a community visioning process. One method is a facilitated community forum with questions designed to generate conversation about what role arts and cultural activities should play in the community.

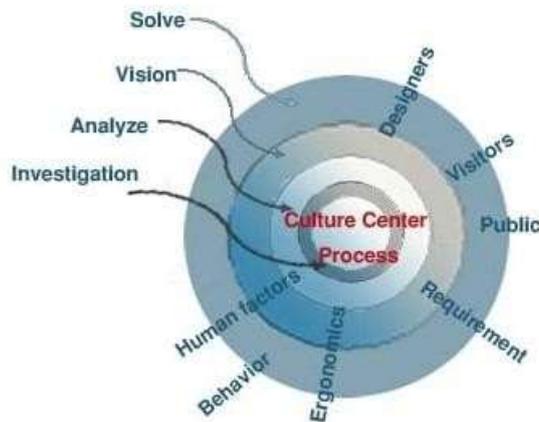


Fig:4 The cultural Center Process

3- Creating a sustainable internal environment for cultural centers in the Arab Republic of Egypt.

The requirements of the internal environment in the design of the vacuum are intended to study the control of the internal characteristics of the vacuum in terms of:

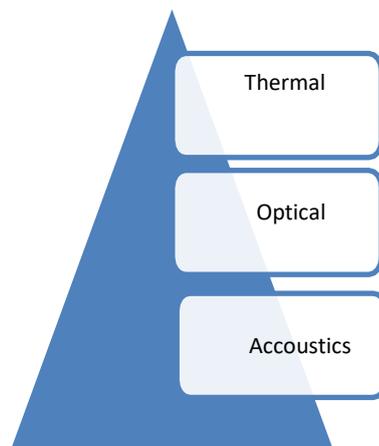


Fig.5 The requirements of the internal environment.

3.1. Thermal configuration of the internal spaces in the Egyptian cultural centers in the Arab Republic of Egypt

The thermal configuration of the internal vacuum is defined by the creation of the internal vacuum of the thermal occasion for the comfort of the human body, which affects its production capacity and efficiency in all activities by natural or industrial means.

If the objective is to identify the characteristics imposed by the climate on the interior design, it must first identify the factors affecting the climate to choose the appropriate solutions to suit the comfort of the human in the place where he lives,

which achieve the provision of appropriate climatic conditions inside buildings and these factors are determined in the rays Sun, temperature, wind, natural lighting, evaporation, humidity and precipitation to reduce heat load on the building.



Protection of the building and the internal space from the falling rays by providing as much shaded areas as possible to reduce the heat load produced within spaces by:

- 1- The use of compact design: where the outer spaces are minimal and the buildings are compact and shade each other, with the design of buildings with inner courtyards open to the sky, especially in the desert regions and taking into account the increase in the proportion of the height of the walls of the urban space to a high percentage of shading.
- 2- Vacuum orientation: by reducing the surfaces of buildings that receive solar radiation (southwestern walls) to reduce the convection inside the interior spaces. Treatment of the southern and western walls of buildings using double walls and the use of afforestation to protect these walls from the impact of direct radiation.

3- Treatment of solid parts such as ceilings and walls: through the environmental raw materials sustainable properties that prevent the absorption of heat to and from the building and its spaces.

3.2. The optical configuration of the internal spaces in the Egyptian cultural centers in the Arab Republic of Egypt

Light and its effect on the human eye is one of the basic ways in which people interact with those around him, the interaction of the individual with the perimeter of vision, this interaction usually results in feeling.

Natural lighting:

- The use of natural lighting achieves visual comfort due to horizontal light steering that creates a reasonable form of shadow, a minimum of disturbing reflections and excellent lighting for vertical surfaces.
- The gradual diversity of light throughout the day leads to effortless eye adaptation and keeps away from static lighting.
- Natural lighting is the correct medium to review and the temperature colors resulting from its use are much lower than most types of industrial lighting.

The main objectives of successful natural lighting recruitment in creating the inner space are:

- a- Lighting the inner space and its contents in a systematic way achieves beauty and psychological and visual comfort.

b- Focus on specific purposes to illustrate their texture and shape, or in the case of a particular activity, such as reading, the place is illuminated to such an extent that it can be performed efficiently.

Light within the architectural void is not a constant element, but it governs the natural comfort of man. Light, whether natural or industrial, can make the aesthetic change of space. The difference of light in the void is desirable not only for the purpose of difference but also to create shadows and show the feasibility of texture and colors through the strength of its intensity and we find in contrast the lighting of the vacuum organized lighting makes it appear dismal and cool without the effect of dark and lighted areas. The strategy of using innovative natural lighting systems aims to interact with and integrate the industrial lighting system to improve lighting levels to achieve visual comfort in a way that does not interfere with visual continuity and reduce cooling loads:

One of the systems in place that has proven its worth such as Himawari system acrylic dome.



Fig. 6 Himawari system

- 1- Acrylic dome
- 2- Sun-Tracking sensors
- 3- Lenses
- 4- Control unit

The system is based on a fresnel lens for light concentration, and optical fiber supposition, and was invented in Japan and contains a set of high-efficiency lenses and sunlight satellite compounds driven by double engines and covered by an acrylic dome, and a controller located at the base, A microprocessor calculates the location of the sun and determines the angle of its fall when it disappears behind the clouds and then the lens is retained directed at the sun. When sunlight falls on the lens, it focuses on a set of fiber optic peripherals that transfer light to the inner spaces.

These techniques are based on the selection of appropriate lighting systems that are integrated with natural lighting, if any, to conserve energy, and energy is controlled through software and hand-held devices, and their characteristics include the operation and automatic extinguishing of lighting through light cells, sensor systems and adjustment of lighting levels. Internal by number of users and occupancy, allowing personal adjustments through computer or telephone, and managing energy consumption through the process of monitoring the work of spaces and self-adjusting to suit the required lighting.

3.3. The acoustics configuration of sustainable environmental spaces in cultural centers in the Arab Republic of Egypt

The intensity of sound at a given point is defined as the rate of sound passing through the unit of space perpendicular to the direction, and the further away from the source, the less intense the sound because the same intensity is distributed on a larger flat .

Acoustic insulation strategies:

The designer's methods of noise handling vary according to their source, nature and type, so the designer's strategies for addressing internal and external noise vary by:

The required calm can be controlled - reduce the frequency of sound - in different spaces depending on their use by the cladding of walls, ceilings and floors with sound absorbent materials for different frequencies in addition to the shape and proportions of the same architectural space, if the floor, ceiling and walls are not parallel, The walls are covered with wood or any sound absorbent materials, the ceilings are covered with slabs with a lock behind,

The simplest way to protect against noise in external sound sources - is to stay as far away from the source as possible by making an air barrier, or to make physical barriers to prevent external sound from reaching – or to design the building itself to prevent the arrival of physically or airborne mobile sound, and to study the relationship between the sound level between any two spaces and the loss of For the transmission of the incident,

it is clear that the level of sound transmitted to the receiving room is disturbing to the users of the vacuum if it exceeds the rear volume of the room, and accordingly it can be said that the rear volume is very important.

Sound absorption:

The sound travels through the material, the sound waves beneath the particles of matter and occurs the loss of part of its energy through friction and this part of the energy turns into heat inside the particles of matter or part of the sound energy is lost when the sound waves fall on the surfaces through resonance and this happens with the surfaces It's bad, and it's fluctuating when the sound waves fall on it when their natural oscillation is equal to the pulse of the colliding sound wave, and it's obvious in the wood, glass, and gypsum cutters that are ringing if sound waves fall on it, absorbing part of the acoustic energy by ringing. The importance of the absorption of materials by resonance in the interface processors, especially the windows and the provisions of their closure with flexible materials such as the rubber to provide the flexibility necessary for the movement of the glass thus increased absorption.

Results and Discussion

- 1- Leading energy and environmental design system to achieve minimum environmental standards.
- 2- The study of environment helps to find sustainable and effective growth to issues related to internal spaces.
- 3- So what an eco-friendly building can achieve comfort, ventilation, natural light and everything that contributes to human health and well-being.
- 4- Culture Contributes ensure ecologically sustainable development.
- 5- Promote sustainable through a strong cultural awareness.

Recommendations:

- 1- Promote new values and ways of human life to achieve more harmonious relationship with local and regional sources and environments global.
- 2- Provide public awareness about appropriate processes.
- 3- The emergence of living culture to perpetuate the natural response and natural harmony with local environmental factors.
- 4- Respect for natural resources.

5. Environment-friendly response.
6. Use of specialized technology and appropriate to the functional need.
7. Appropriate design of the ecosystem and cultural context.
8. Culture and art can be rolled as tools with which to visualize, discuss and analyze the common challenges facing society in terms of sustainability.

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