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دور التقنيات الحديثة في تطور التصميم الداخلى للإستراحات والنزل (الموتيلات) علي الطرق السريعة الصحراوية

The Role of Modern Technologies in the Development of Interior Design for Rest Areas and Motels on Desert Highways

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على الطرق السريعة الصحراوية
The Role of Modern Technologies in the Development of Interior Design
For Rest Areas and Motels on Desert Highways

ملخص البحث
The Research Summary
ثانياً: باللغة الإنجليزية

Alexandria University
Faculty of Fine Arts

Summary of PHD Degree

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The Role of Modern Technologies in the Development of Interior Design for Rest Areas and Motels on Desert Highways

With the development of urban development in Egypt and work, building new cities, and adding them to cars for drivers, vehicles and cars competing in building large tourist lounges with the use of the latest technologies, the rest becomes an icon of the state and a symbol of its entry, however highways in Egypt lack the participation of forums, especially highways.

Chapter I Solutions and Treatments to the Design problem of Rest Areas and Lodges in Egypt

It includes three main themes, **Axis I : General plan of The Research study , Axis II : The Design problem of Rest Areas and Lodges in Egypt** , One of the most important considerations of good design, that design can only be replaced by old knowledge with a better design for the same problem and not because of changing the old character or showing modernity and keeping pace with the times only, so design theory in general until now is still driven by personal whims and superficial studies instead of being based on Foundations of theory due to misunderstanding and scientific ignorance, and this is according to what was proven in the book Theory of Architecture by the designer "Nikos Salingaros", and from here it was found that there are two parts to the design crisis in restrooms in Egypt: A- The design problem: the traditional design is not suitable for designing restrooms in the modern era, as it was found that designers in Egypt used three methods for designing restrooms, which are: Modular grid - Design by simile or repetition - Utilitarian design. B- The environmental problem: Of the most important environmental problems in Egypt:
- "Desertification", which is a geographical phenomenon that means the decrease or deterioration of the biological production capacity of the earth, which may eventually lead to the creation of semi-desert conditions, including sand dunes formed as a result of erosion factors through the interaction of desert rocks with extreme temperatures and continuous winds, and among the most important treatments and solutions The invention that was put forward to tackle desertification: The project of natural microbial interaction of bacteria with sand particles by the designer "Magnus Larson" through bacteria that binds and solidifies sand particles, resulting in places and spaces suitable for

coexistence and housing. -"The problem of water scarcity in the deserts of Egypt," and although Egypt's desert is dry and arid, and while groundwater currently provides only 7 percent of the demand for water in Egypt, in recent times, it has found great interest in increasing its exploitation and utilization of its resources. Especially in the Eastern Desert; To alleviate the growing water stress and absorb new projects, and among the most important treatments and new solutions that have been put forward is the scarcity of water: chlorine isotopes as chemical reagents for the detection of groundwater, its age, viability and its origin in 29 sites in the Eastern Desert in Egypt, in the shallow layers, in addition to the aquifers. In bedrock (on which soil and sediment rocks are anchored) -Recycling (gray water) and its goal is to reduce the waste of water resources in Egypt by collecting water for daily use, except for toilet water, as gray water is characterized as semi-pure water, but it is mixed with some bils, soap and minor pollutants when we use daily, and one of the most important treatments and solutions developed Introduced to tackle the problem of water scarcity: Water collecting cover, Rainwater collector with solar shading - Rain Water & Sun Shading Collector, Air Water Collection - HOPE TREE, Roof Integrate System. - "Wind energy in the deserts of Egypt", wind resources are best along the coasts and on the hills, but wind resources can be found for use in most desert areas as well, because wind energy as an energy source is predictable and solar energy is also available in a typical well for hours of climate A specific year, desert climate, this is part of the desert environmental design, and one of the most important treatments and solutions developed that use this source in generating electrical energy and its source is wind. It has been put forward to develop wind turbines:

- New Silent Wind Tree Turbines Make Energy Production ،The Whirlers: A Colorful Wind Turbine Installation for Fresh Kills Park ،OLED Turbine Aliasing.

Axis III : The Psychological, Functional and Aesthetic need of Rest Areas, A- The psychological needs of the inmates of breaks on the highways: the inmate of restrooms and motels differs from the inmates of other hotels, so inmates are traveling by car or vehicles on the roads and travel is for the purpose of tourism, either to seek knowledge, or to work and trade, and some are for recreation, shopping or treatment Others, requesting it for a religious reason, and in order to secure a comfortable, enjoyable and useful trip for the traveler, found inns and motels, which were called in our Arab countries in the past (khans), and which provided the traveler and his bed, the necessary measure of safety and comfort, On the other hand, designers rushed to design special spaces to break the rigidity of space and try to address the psychological feeling of the individual to overcome the bad impact and get rid of boredom, fatigue and exhaustion, and the most prominent of them is the American designer and optometrist, "Adelbert Eames", presented the American Eames Room, to present an experiment that demonstrates the importance of using space To break down the psychological barriers of individuals.

B - Functional and aesthetic needs of the guest lounges on the highways: by moving away from the routine design, being keen on using good comfortable furnishing and securing the place sufficiently and remarkably, the open design and the closed dimension, so that the guest can get to know new people, he needs to exchange different cultures, use Techniques to provide sufficient knowledge and information to alleviate the inmate's tension and also his desire to know as much information as possible from the country he is moving to.

Chapter II Contemporary Design Process Compatible with Site Topography (Desert Highways)

It includes two main themes, **Axis I :The Nature of the Desert Environment and The Requirements of the Design Process,** A- The natural characteristics of the desert environment in Egypt, from the climate, water resources, plants and soil. B- The functional needs of the design process for desert areas in Egypt, by addressing the following points: 1- Harmonization with desert environment needs, 2- Environmental and ecological design compatibility: in terms of "climate comfort - thermal radiation and solar energy - design compatible with the hot climate region and autonomous means" c- Design principles for buildings in desert areas, by addressing the following points: A- Protecting the external facades from the sun's rays, B- Using appropriate materials and materials, C- Achieving good natural ventilation within the internal space, D- Using corridors, grading the spaces and the vegetation screen, C - Building techniques for desert areas according to the environmental content, and deals with addressing the continental climate with contemporary building techniques and building methods that are more appropriate to the nature of the desert environment and more adapted to its climate through several directions towards desert construction, which are summarized in: 1- Building above the ground (raising the building) With the study of environmental conditioning, a case study: Siangchuan rest in China designed by the engineering company "Plat Asia" for Urban and Engineering Development (2017), 2- Underground construction (passive building), with amenities, sunlight, ventilation, plants and display screens Interactive, Arizona Desert Break by designer Matthew Frombolotti (2018-2021).

Axis II : Environmentally Compatible Materials Technology, 1-Solar Negative Technologies, which is the design according to the data of solar energy and the goal of designing a passive solar energy building is to make the most of the local climate by storing and distributing solar energy in the form of heat in winter and rejecting the sun's heat in the summer, and this is called design Passive solar or climate design, passive solar technologies include the following: Solar Filter – Techniques, Techniques Solar – Collectors, Passive-Cooling Techniques, RoofPond. 2– Techniques. Smart materials technologies, so smart materials are the product of the interference of traditional materials with microelectronic systems, and these materials undergo major changes in shape in response to external influences such as stress, heat, humidity, acidity, or magnetic or electrical fields, by means of micro-devices built into these materials such as sensors and chips. The smart materials are classified according to their reactions from smart materials that emit light, shape-changing and color-changing. Smart materials technologies include the following: Smart construction materials-Smart non-construction materials. 3- Sensors, sensors, there are many types of sensors and transducers, and the difference in the types is due to the difference in the form of energy that is used: mechanical / thermal / electrical / magnetic / radiation or chemical and can also be classified according to the expected use of them. 4- Nanotechnology and Plasma manufacture, the plasma has made a terrible development as it used nanotechnology to show the materials and raw materials manufactured with plasmas, which gave the designer solutions and effects that were not previously proposed, and the self-cleaning surfaces appeared, the invisible walls ...., And other internal innovations, among the most important of what was presented "Project of transformed spaces to adapt to surrounding variables", hence terms appeared from the concept of transformed space Metamorphosi Spaces, The Metamorphosis design concepts, and among the most prominent of what was proposed by Metamorphosi Spaces: The walls of the transformed flash - the bed of the kinetic position - The sensor table in the schedule and others, as previously mentioned. 5 - Kinetic Interior Design, which is defined as spaces and elements characterized by the ability to reconfigure and organize themselves in order to meet changing needs by using computer systems that analyze

functional conditions and then direct movement control systems to make changes to suit the needs of the use, and includes three components or Major Groups: Self-erecting structures (skeletal bodies) - the mechanisms / mechanisms (kinetic components), which is the formation by a unit or two of a kinetic mechanism. The four geometric transformations in space: sliding, rotating, scaling, folding, or forming by one or two kinetic mechanisms and one or two From robotic units for remote sensing or finally, forming by complex systems in the kinetic configuration, which is an infinite number of robotic mechanisms and units - structural bodies, including: flexible such as: movable parachute interface, design by Francesco Gatti - Shanghai (China), solid such as: LEED golden interface Designed by "Woods Bagot" - Australia and composite structural bodies such as: Ecological Kinetic Building "Disaster Prevention" by designer "Ricardo Mariano", Istanbul.

Chapter III The Concept of Rest Areas: Study the General Planning and Distribution of Spaces in Them

It includes two main themes, **Axis I : The Concept of Rest Areas and Contemporary Design Requirements for Highways,** Through two main parts, namely: A- The concept of breaks, motels and lodges, through:The tourism aspect, which is represented in the concept of tourist breaks, as it began to spread in the country after the expansions and openings of new cities in the current years with the increase in tourism movement in Egypt. In addition to good communication services, the service side is represented in the concept of car passenger breaks (road breaks), as it is considered the origin The rest is for the purpose of providing comfort areas for motorists and heavy vehicle drivers and is a major contributor to the provision of highway services, and it is not widespread enough in Egypt, unlike its spread in Europe and the United States of America, due to the widespread use of cars on trips and travel abroad. B- Design requirements and considerations for highway breaks, by getting to know: The concept of highways, as they are arterial roads dedicated to traffic service, and entry and exit to and from these roads are through specific well-studied and distant points, so that vehicles enter or exit gradually without exposing other vehicles on the road to danger or reducing its speeds, and there are considerations. It should be considered and addressed during the initial design of the break before moving on to more detailed design stages which were covered in the classroom with several points, the most important of which are: Safety and security conditions for designing rest houses on highways - Highway requirements, which include traffic lanes or paving widths, traffic intersections and road shoulders and their appendices - Basic criteria that are taken into consideration for determining the resting location on highways - Topography and principles for choosing a resting location on highways The choice of the resting site depends on many foundations and factors, the most important of which is the topography of the area on which the rest will be established, as the nature of the land and its topography affect all the basic elements in the design such as slopes, horizontal curves, vertical curves, viewing distances, and even ensuring safe paths to the site at the lowest costs, For example: Lochini Lounge, Designer J. Mayer **Axis II : Study the General Planning of the Rest Building and The Distribution of Its Spaces, By the following:** Factors for planning motels and lounges on highways, from planning open-design restrooms and planning closed-style restrooms - the basics of designing lounges and motels on highways, from directing the lounge and motel building - Factors affecting the good design of the restrooms - The foundations of analyzing movement paths inside the motels and motels - Classification of lounges and motels according to the formation of the building, there is a simple design with one building such as: the Nimmenharjo motel on the European-Finland highway, a separate composite design such as: : SOCARL REST by the designer "Jurgen Meyer" - Highway Georgia - Lucheni, Modular design, such as: Motel Air de Spey, designed by "Philippe Samen".

Chapter IIII Study The Effect of Modern Technologies on Functional Design of Motels

"Study the resting components (motels) and the basic and secondary facilities includes and the development that follow"

This chapter deals with a major focus: 1- Study the resting components (motels) and their basic and secondary facilities and the development and development that follow from them, by getting to know: A- The main building, which includes: - The main entrance (lobby): the entrance hall - the reception area - services for guests and visitors. One of the innovations in the smart biological wall technology was highlighted - "Bacteriography" by the designer, Mitchell Joachim. Restaurants and cafes: It is considered one of the most important service areas that must be taken into account when designing lounges, it must be designed with special care so that all the spaces of the restaurant help to provide the speed of service and movement, it should have short and moderate rows to eat easily and avoid any intersections to avoid Creating chaos for the inmates. Sleeping rooms, restrooms and motels: The rooms remain the most important place in the entire motel, as they are the place in which the guest stays for the longest period, and unlike hotels located in cities, motels are usually extended on the ground, as they include from 10 to 40 rooms with full facilities, where one user is allocated for every ten rooms The entrance to the motel rooms differs from the hotel rooms, as the motel rooms include a small entrance area for parking some cars, and then an open or closed garage and as close as possible to the bedrooms, and exit is passed through reception, monitoring and handover of keys. B- Open and entertaining spaces, and the purpose of taking them is to emphasize their importance in designing breaks, as considering it an extension of the internal space and linking the relationship between them, C- Gas station. Requirements are applied when designing gas stations and rest stops on highways either (without service) or stations on highways (equipped with service methods), and there are basic services required to be provided around the clock from the chapel, maintenance workshop, spare parts Cars and public toilets, a case study was made, the gas station, the design of the "SAD" Atelier - the highway between Galanta and Solvica and the "CEPSA" gas station - the highway between Adanero and Avila in Spain. D- Parking lots o highways. It is preferable to provide the following: One parking lot for every guest in the motel one parking lot for every five seats in the restaurant - one parking lot for every three employees.

Chapter IIIII The Role of The Modernization Surfaces in Changing The Concept of The Perception Nature Internal Spaces in Rest Areas and Motels

It includes two main themes, **Axis I : Solutions and Treatments for Architectural Elements Rest Areas and Lodges,** For lodges and rest houses of all kinds and their direction when desig them, they must contain several specific architectural elements that form the general shape of building and meet its functional requirements, and these elements are as follows: The exte facades, the facade plays a big role, especially in the visual environment. Many designers i West have presented models for new external facades that reflect their response to diff technology systems, the most important of which are: perforated metal façade, designed by architekten - the tubular structure façade. MOCA, designed by "Faulders Studio", which respo the driver's perspective from the road. The surface data of the building from signs and colo clearly visible using an extra layer of metal tubes. Venous membrane window, they are poly materials that are able to retain large quantities of water and have a high ability to control lig temperature - signage signs, such as photoluminescent signs, are completely harmless to

non-toxic and cost effective because they light without electricity and require Only a stream to emit light, releasing energy in the form of a glow in the dark for hours, however, its brightness gradually diminished - the service part, and it includes: toilets, including toilets for servicing guests inside lounges or toilets to serve drivers outside breaks, such as a case study: toilet structure - Jeelong restroom, design BKK Expressway Corporation, Australia The aim of its design is driver fatigue which has been a factor in 20% deaths on Victoria Australia roads each year. In response to this, it developed a Geelong rest area strategy which aims to reduce fatigue-related accidents by adopting a holistic strategic approach to providing comfort areas across major Victoria roads. By providing an interesting and engaging photovoltaic structure or block to encourage drivers to stop and recover - and operate to generate power entirely. **Axis II : Solutions and Treatments for Specifiers of Internal Spaces for Rest Areas and Lodges,** By tracking their innovations, and they are as follows: Interior wall and wall solutions, such as the Breathing Skin wall by designer Tobias Becker which is inspired by organic leather that controls light and temperature between inside and outside, –GEOTUBE crystal wall by Faulders Studio, Tracheolis wall by "Doris Sung" Through the use of thermal metal, the "Wall Memory" - designed by "Jason Bruges", which is like electronic paper that captures parts of clothing and the shape of the body and mixes them into the wall as visitors pass by using multiple cameras, the voice message wall designed by "" Ben Rubin, which is a wall that receives messages electronically and through which there are conversations over the Internet. The Braille wall uses detectors by means of a "granular synthesis" that makes the letters in "Braille" on an interactive wall that speak upon touch Flooring solutions, projection floor for multiple use from the use of a video projector - mirror - computer and image detection system such as a camera and consists of (simple system) and (combined system), ID floor, Bichromatic flooring which is a series of Tiles made of plastic packaging layers and non-toxic mercury liquids that generate colorful shapes. Ceiling solutions, Vermilion Sands ceiling by designer Matthew Soules, a living ceiling design where unprecedented use of water seed is the Entrium Light Cloud ceiling designed by Thom Faulders, inspired by light filtering effects, Breaking the Surface ceiling designed by SDG It is a simulation of the generative movement of space, breaking the inertia, stiffness and not feeling bored. It is a wavy surface of colored tubes that move rhythmically in response to visitors who pass under it and it is called "breaking the surface", the ceiling of "Exoti" technology designed by "Ball State" and is considered one of the rapid manufacturing techniques of During the use of computer tools, the ceiling is made of illuminated hex panels that act as a point of contact for infrared sensor data, Arduino micro-controllers, to control the position of the machines, as these sensors aim to detect the speed and direction of visitors and workers. Furnishing unit solutions, the Memory Foam seat by "Thom Faulders" that transforms the traditional seat into a relaxing space, the Antenna Seat Unit designed by "Masamichi" and It is a rotating unit that is movable and connected to a vertical axis of LED. The unit is foldable and includes an open interactive platform supported by maps and E-Bench Charging, by the designer "Nuno Erin" which is a seat made of a hard surface of transparent acrylic resin and allows users to simply recharge their phones, color sensor seat Color Responsive Chairs by the designer "Wald Meyer", where the designer presented an innovative set of seats with RGB sensor in the back, so that the seat can read the color of the clothes.

The study concludes by presenting a practical proposal by designing a motel on the Egyptian desert highway - about 100 km south of Alexandria. It also concludes with the most important findings and recommendations of the research.