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(دراسة تطبيقية لمتحف الأحياء المائية فى الإسكندرية)

Adaptive architecture and its interaction with the interior design of exploration centers

(experimental study on aqurarium museum of Alexandria)

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Chapter one summary

Aquarium exploration centers have a civilized message and have multiple functions, includin scientific, cultural, social, educational, behavioral and others. In the modern era, it has becom one of the most prominent architectural elements, where architects and constructors find a grea opportunity to show their artistic vision and academic studies that match the displayed style and many public aquarium exhibitions have been designed and built around the world durin the last three decades.

-Studying the site in terms of climate, geographic factors and attractions in the area, as wel as economic aspects And social helps to reach criteria for the selection of sites for aquacultur centers. - Choosing the exhibits, studying their characteristics and needs, and identifying thei way of life to achieve a suitable environment for them. - Addressing the study of the rav materials of the aquarium display, the services attached to it and the stages of evaluation heating, cooling and water purification.

- The chapter deals with the most important elements of aquarium museums and exhibition and how to develop the idea for a more comprehensive idea, which is the exploration center of aquatic life.

Summary of the second chapter

The study of the interior design of the aquarium exploratory centers and what they contain and their relationship to technological development on their interior design, and to make optima use of technological development, and to achieve all the requirements of the building from providing the external architectural form and addressing the internal space for it.

- The importance of studying the relationship between the angle of vision and the plane of the viewing window and the appropriate dimension of the window narration, avoiding the overlap between the distance designated for the visitor to stand in front of the exhibits and the paths of movement.

The addition of activities attached to the exploration center has a financial return that helps in the process of repair, maintenance and development.

- Educational museums aim to present the elements of life and collect them in one place to deliver an idea to the viewer in the shortest possible time within an entertaining atmosphere Distributing display basins and designing them in special shapes.

- It is preferable to excite and attract to achieve interaction between the educational and exploratory aspects of the children with the exhibits: because children by their nature prefer movement and discovery and achieving their desires keeps them away from the boredom that may be reflected in their behavior, so their parents cannot continue watching the show.
- Appropriate educational aids must be provided: whether for researchers or the general public, through educational boards and touch screens.

- Adding new technological spaces for virtual reality that enhances the design of the research center for aquatic life, where the third dimension or anthropomorphism plays a major role in virtual reality technology, as the outputs are similar to aquatic reality models, and make the person dealing with them integrate completely as if they are immersed in the aquatic environment simulating the same reality, This technique involves the human senses in order to have an experience that is very similar to reality, but it is not real.

Summary of the third chapter

This chapter studies responsive architecture in a different way, as it looks at how to apply this architectural trend through the use of smart materials in unconventional ways, where the capabilities of materials to change their shape according to a specific architectural change, the chapter deals in particular with the kinetic behavior of materials and a prelude to some models The application that will be applied in the practical application of the thesis, how to exploit it architecturally as an alternative to the use of mechanical machines due to their complex structures and high energy consumption, which leaves damage to the surrounding environment. Responsive architectural design differentiates itself from other forms of interactive design by incorporating smart and responsive technologies into the building blocks, and is often associated with the use of mechanical systems, sensors and actuators. Others, accordingly, researchers have shown an increased interest in a new approach to more responsive architecture, in which complex mechanical components are replaced by the behavior of materials, and recent developments in the field of materials science have led to a renewed interest in the possibilities of materials behavior and how the properties of certain materials can replace systems. Mechanical through the use of "performative materials".

Responsive materials include natural materials that have intrinsic properties and natura abilities to respond and implement the necessary motor response without the need for externa energy or the addition of mechanical elements. Smart materials also embody intrinsic properties as they work on receiving, transmitting and processing the stimulus. And response by producing a dynamic effect. Responsive materials are those that perform functionality in the built environment. Recent developments in the field of software, computers, and tools fo architectural analysis and simulation have allowed to achieve this architectural trend, where i has become possible to introduce the behavior and properties of materials in the process o designing materials systems. responsive.

Chapter the fourth Summary

Through the study of the fourth chapter and the analysis of the practical application, it was noted that the Aquarium in Alexandria was characterized by taking the classic monotonous character, in which the essence of what is contained in the museum is absent. In the project taking into account the functional aspect and studying how to develop the horizontal plan and exploit the untapped spaces while preserving the space for the aquariums display, taking into account the drainage and withdrawal of sea water. It also includes the addition of new recreational, educational and exploratory spaces for visitors and children.

The transfer and development of the Mummified Aquarium Museum from Qaitbay Citadel to the Aquarium Exploration Center was studied so that the visitor's museum tour would be connected.

The study was taken into consideration of the visitor's movement path through the horizontal plan so that the tour is connected, starting from the entrance and explaining the spatial spaces of the museum to the spaces for displaying the aquariums, then moving to the exploratory spaces and the recreational instruction and then to the second floor where the mummies museum and when the visitor moves from one space to another There are interactive guiding panels to explain what the exhibits include, and the visitor can explore the information on their own.

It also deals with the practical application in the field of adaptive applications to benefit from them in the development of old buildings, as it was applied to the external facade of the Aquarium in Alexandria to apply sustainability to provide electrical energy, and control light and heat within the space.

Applying adaptive architecture to the interior design of the walls and explaining the mechanism of movement and air flow to improve the level of internal ventilation of the space in the event of an increase in the number of visitors inside the space, and for ventilation in the display space of the aquariums to eliminate the smell of fish.

The fourth chapter also dealt with solving the design problems at the Aquarium in Alexandria, which is to confirm the entrance and exit to the Aquarium Exploration Center, re-design the external facade so that it expresses what is displayed inside of the aquarium exhibits and to be a source of attraction for visitors.

Exploiting more design techniques and smart surfaces, which are a tool for further architecture revolution related to flexibility and self-movement, and the presence of special methods of display for children inside the museum is one of the important things, because the child by nature prefers to discover and touch everything, and the successful exhibition is what provides them with a part of their requirements.