

Interactive design and its impact on Interior design and furniture

Prof. Amal Abdel Khaleq Awad

**Professor of Commercial Facilities Design Department of Interior Design and Furniture-
Faculty of Applied Arts Helwan University**

Amalawad2212@yahoo.com

Prof. Doaa Abdel Rahman Mohamed

**Professor of Fundamentals of Interior Design Department of Interior Design and
Furniture- Faculty of Applied Arts Helwan University**

Doaagoda2018@gmail.com

Researcher. Nermeen Mohamed Abdelfattah Abdallah

Interior Designer at the Engineering Department of the Egyptian Opera House

Nermeen.fattah@yahoo.com

Research Summary:

The use of computers has become a prerequisite and indispensable in all systems, which has led to the development of design methods in general and interior design in particular, and the emergence of new concepts that are fully associated with information technology and computers. In this research, the concept of interactive design for interior design will be clarified, as well as the impact of information technology on changing the concepts and methods of operating some interior design elements (walls, ceilings, floors, furniture), and the extent to which these elements and concepts are affected by technological development, and the impact of this in activating the role of design flexibility within the interior spaces.

Key words:

Interactive design - structure of the interior space - the electronic structure - design of sensations - design of information.

Research problem:

- Lack of familiarity of the interior designer with the scientific foundations and standards of interactive interior design and its most important features and characteristics.
- Despite the technological progress and the development of modern technologies, we lack studies that deal with interactive design as a new trend and its impact on contemporary thought.

Research Objective:

- Activating the role of the interior designer to keep pace with modern technology and use modern methods in design and implementation.
- How to use interactive design in interior design and achieve an interactive environment between the individual and the internal and external space?

Research importance:

To shed light on the interactive interior design, its components, tools and modern techniques for its implementation in addressing the interior space.

Research hypotheses:

The use of modern interactive technologies helps to improve the quality of the artwork, which helps to spread the cultural awareness of the community.

Search limits:

From the middle of the twenty-first century.

Research Methodology:

Inductive method: through theoretical research through books, scientific theses, previous studies and scientific references.

Descriptive and analytical approach: includes the description and analysis of the interactive design and the devices used to implement it and its applications on the interior design elements (walls - floors - ceilings - furniture).

Some concepts of interactive design: -

The physical structure of the vacuum: which includes walls, ceilings and floors with its own furnishing units for each activity individually.

Electronic structure: For vacuum is divided into: material composition vocabulary: it is wire, equipment, communication units responsible for the transmission of information and electronic configuration vocabulary: a set of laws and programs "Software and Protocols" that complement the process of interaction, mobility and receiving orders.

Interactive interior design: -

Make scenarios for the various activities practiced by the human being within the internal spaces and program them within the computer through advanced programs where sensors that work through infrared recognize humans when entering the vacuum and control those blanks and internal devices to interact with them and meet their requirements.

Interactive design can be divided into three main parts:**1- Information Design:**

Depends on knowing the needs and objectives of users through the functions and objectives behind the inner space

2- Interaction design:

It aims primarily to make the inner vacuum able to follow the activities and trends of the user.

3-Sensorial design sensations design:

To create good interactive experience, the designer should try to understand the sensations more and observe the goals of users.

Devices used in interactive design:

There are many devices used in interactive design, the most famous of which are:

- 1-Sensors
- 2- Detectors
- 3- Transducers Power Adapters
- 4- Actuators mechanical triggers.

Previous studies of interaction theories:**1-Designer Daniel Rosen (The Wooden Mirror):**

Transform surfaces from normal materials to digital surfaces after developing their properties by nanotechnology and controlling them by connecting them to precise electronic cells.

2- Designer Michael Fox (The Responsive Awning):

The idea of the responsive parachute is based on the sequential movement of some pipes that rush from the surface of the wall and move through Micro Motors in both the seine and the current direction, and their dimensions and direction of movement are determined by the area, they remain depending on the nature of their use.

3-Designer Mark Golthorpe (The Hypo Surface):

The design of the super surface depends on a series of pistons, that at the end a flexible metal is installed and those pistons are connected to micro controller cells and a source of high light, and when the user moves or approaches the space from this surface, its shadows fall on the surface as a picture and the pistons rush with the help of micro control cells forward, and in turn the metal chips is moved suggestive to the stand and the flat as if it responds and interacts with it.

4-Designer Hayes Ravel (The Super Cilia Skin (SCS :((

In it, the recipient is able to use some other senses, such as the sense of hearing and the sense of touch that both the sighter and the blind tend to use in their interactions and respond to the surrounding surfaces, the idea of his design depends on simulating the effect of the wind when blowing on the fields, as well as the design thought of Harris was influenced by the vibration of the cilia and bristles inside the ear membranes as a result of sound waves.

We will highlight some of the interior design elements that have been affected by the integration of digital technology and its applications within the field of interior design and furniture.

First: Interactive Façade:

Make the interface an active casing that changes its characteristics in response to environmental conditions inside and outside the building, from the smart materials used in interactive design is LCD liquid crystal displays.

Second: Interactive walls:

The main objective of the design of interactive walls is to communicate and interact directly between them and the user:

1-Walls Touch Messaging Devices

The idea is to create a highly sensitive environment towards human existence, when touching the wall, the wall sends vibrations through the bodies of visitors, giving them the opportunity to establish a relationship with the wall in deeper ways such as touch, and it relies on a sound jacket specifically designed for visitors to wear in addition to an interactive wall.

2-Electronics Aperture:

It is a wall of an interactive nature and contains a network of iris Diaphragms, the surface of this interface changes by changing the openings, the different diameter of the veils works to change the permeability and transparency of the surface, which helps to create dynamic fantasies and open a set of channels of communication and vision between inside and outside the surface of the interactive wall.

3-Electronic Tiles:

This type of tile has edges of electronic Led, electronic valves to give a quiet and dim light and appear in the form of molds, the tiles can be placed or stacked together in any order and using electronic valve technology installed in the tiles allowed the opportunity to display all colors of the spectrum on a large scale with the possibility of using basic colors and overlapping colors that cannot be achieved through traditional lighting technology.

4-Wall of Light:

The length of this wall is more than 50 m and consists of a series of steel panels with more than 160,000 glass marble pieces, most of the panels are a lit background of cold thick raised by kinetic sensors installed at the end of the led light emission valve unit, which has size of 9× 1.5 m, which in turn displays text messages at an altitude of 1 mm.

Third: Interactive floors:**1-The Magic Carpet System (Z-Tiles):**

It is a system in which the installation and play network, net Workable plug*play for tiles called Z-Tiles was used, and in this system we find a series of interlocking tiles equipped with integrated processors, which is a series of electromagnetic wires in the direction of X and R, used to sense the dynamics of the foothold when pressing and moving.

2-Contact less Interaction:

It works with Light Input Device (LIP) light input device with interaction lights through seam, a device specifically designed for contact interaction solutions, it allows to get rid of the mouse, keyboard and joystick and move easily through the applications of the objectionable movements of the hand.

3-The Mysterious Ice Passage:

When a visitor decides to enter unknown lands, the floors of the corridors begin to glow and change their appearance, and the corridor begins to reveal its secrets.

4-Sensacell Interactive Floor:

It is a system based on the sensor unit, which can be assembled in the form of interactive surfaces of almost any size or form and consists of 6 separate units each containing LED Lighting sensors and sensors that can detect people or moving objects close to the surface at a distance of 150 mm and light accordingly even through materials such as glass, rubber and wood.

Fourth: Interactive Ceilings:**1-Versa Pixel point lighting system:**

This system has the ability to form and employ in various interiors, a new light formation that gives complete freedom to pixels-shaped designers and 3D shapes.

2-The Glowing Ceiling:

The ceilings and walls here consist of very small units of dual lights, glowing LED valves with white background and Sensors installed in each electronic slab of ceiling tiles, which in turn store light during the day and provide it to the evening.

3-LED screens installed with ceilings: LED Screen

It is a huge 250-meter-long roof of 30 meters of LED screens and is very luxurious, and is fixed in the interior spaces to give 3D intimations.

4- Kinetic Roof:

This type of roof resembles umbrellas that open and close attractively depending on the weather, sun and rain, and can be adjusted according to the desire, and this type of ceilings is considered an interactive experimental solution.

Fifth: Interactive furniture:**1-The Interactive Mood Chairs:**

This seat interacts and responds to the user and the environment through affected sensors and monitors movements and consists of diode lighting as well as an electronic program consisting of microscopic chips and sensors interact with the user according to the mood and the surrounding environment.

2-The Glowing Seats:

It is the use of interactive lighting within the seating areas of the public, it lightens and hides flashes and changes color according to the presence of users and are made of phosphorous materials radioactive to light.

3-The TelePresence Lounge:

The sofa waits for the presence remotely where the external surfaces are covered with control units, touch and small sensors, thus responding to the movement of pressure seated on it (+, -) as the small sensors respond to the body temperature and the condition of the individual in the form of colors of surface lights varying brightness and glow with different moods of the individual used for it.

Results:

- The interactive vacuum is different from other spaces where it depends on the mutual response between human beings and the elements of space that depend on digital technology.
- Interactive interior design is based on three stages that are related to each other to achieve mutual interaction between the dimensions of the vacuum structure (information design - interaction design - sensation design).

- Interactive interior design is based on a range of equipment, the most famous of which are: Sensors - Detectors - Transducers Power Adapters -Actuators mechanical triggers.
- There are many models and applications of interactive design technology through different vacuum elements of ceilings, edges, floors and furniture units.

Recommendations:

- The need to use interactive design technology in creating a distinct interactive experience between man and emptiness, which encourages the spread of a new concept of the environment of internal vacuum by responding of the vacuum to the needs of humans.
- Contribute to the establishment of research centers to prepare designers to develop their creativity and local community development.
- Work on the numbers of interior designers and raise their designs and creative capabilities, and guide them according to general system aiming at achieving advancement and development and familiarity with modern digital technology.

References:

First: Arabic References:

- 1- 3bd alr7mn, d3a2 m7md, ast5dam althora alr8myawal5amat alzkya fy tsmym alfragh alda5ly altfa3ly, alm2tmr aldoly althany lklya alfnon alt6by8ya, altsmym byn al ebtkaryawal estdama, klya alfnon alt6by8ya, gam3a 7loan.
- 2- M7md, 3la smyr asma3yl, athr ast5dam alnsyg alzky fy t6oyr altsmym alda5ly altfa3ly, m2tmr klya alfnon alt6by8ya, gam3a 7loan 2008m.
- 3- Wajih, dyna fadl askndr, athr altknologya almt8dma fy t6oyraltsmym alda5ly altfa3ly llmrakz altgarya ald5ma, rsala magstyr, gam3a alaskndrya, klya alfnon algmyla, 2012 m.
- 4- alsyd, amyra 3bd al3zym, tathyr al3mara alr8mya altfa3lya 3la altsmym alda5ly llmta7f alathrya, rsala magstyr, 8sm altsmym alda5lywalathath, gam3a 6 aktobr, 2000m.
- 5- smyr, a7md, saml, mfhom almrona fy altsmym alda5ly mn 5lal mnzoma altfkyr al ebda3y, rsala dktoraa, klya alfnon alt6by8ya, gam3a 7loan, 2010m.
- 6- Raft, 3la, thlathya al ebda3 alm3mary, dorat al ebda3 alfkry, 3mara almst8bl, mrkz ab7ath antr konslt, 2007m.
- 7-Raft, wa2l, altfa3lya knmozg ltkaml alfragh alda5lywal elyktrony, b7th mnshor, m2tmr alfnon algmyla fy msr ma2a 3am mn al ebda3, klya alfnon algmyla, gam3a 7loan, al8ahra 2008m.

Second: Foreign references:

- 1- Ritter, Axel, Smart Materials in Architecture & Design, publishers for Architecture, 2007.
- 2- Bullivant, Lucy, 4dsocial: Interactive Design Environments (Architectural Design), Published by Willy, ISBN-13. 2007.
- 3-Beesley, Philip, Kinetic Architectures Geotextile Installations, published by Riverside Architectural press: first edition, 2010.
- 4- Khaled Sherbini and Robert Krawczyk - "Overview of Intelligent Architecture"- 1st ASCAAD International Conference, e-Design in Architecture- KFUPM, Dhahran, Saudi Arabia. December 2004.

Internet Sites:

- 1-www.interactivearchitecture.org
- 2-www.mindfuldesignconsulting.com
- 3-www.psychology.about.com
- 4-www.springerlink.com
- 5-www.archinode.com/cilia.html
- 6-www.archdaily.com
- 7-www.designboom.com