



SENSORIAL DESIGN APPROACH IN BUILT ENVIRONMENT

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Abstract: This study aims to investigate the significance of the five senses and the sensations that architecture can evoke. How we feel impacts how we live, how we inhabit space, and how we construct our lives. Designing our environment with our expertise helps human evolution and development. After everything that the pandemic has caused, the globe must remain optimistic today. Your emotions and sentiments may alter depending on your location. The constructed environment consists of additional senses besides sight. The concept behind this is how multiple senses function as interior design instruments. The five senses consist of sight, touch, smell, and hearing. Their relationship with architecture and examination of various parts of the built environment. From there, the relationship between persons and their emotions is formed. The purpose of the study is to learn about the various senses, to identify the architectural components that aid the senses, and to examine the link between the senses, the architectural aspects, and how they affect the space.

Index Terms - Sensorial, built environment, experience, multisensory design, human senses, light in architecture

1. INTRODUCTION

Throughout history, vision and the eye have dominated architectural practise. In recent decades, architects and designers have begun to incorporate additional senses, including sound, touch (including body awareness, kinesthesia, and the vestibular sense), smell, and, in a few instances, taste. When a facility is created with our senses in mind, navigating it becomes easier and more intuitive. Taste, smell, and touch generate an experience of the surrounding space, whereas vision and hearing create a perspective of the space. However, restricting the awareness of the other senses by the use of or emphasis on a single sensation in design.

"Architecture is the art of reconciling oneself with the universe, and this meditation occurs through the senses." - Juhani Uolevi Pallasma (2005) (Finish Architect). The significance of the senses in architecture lies in the creation of a user experience. This is done not only to examine the functional space, but also to emphasize character-building. Design element centered on the sense of the area in terms of touch, smell, and sound, rather than appearance. as an empty space Architecture should involve multiple senses. When building a more exciting built form, architects must consider the aforementioned factors. Thus, doing so will result in a vastly different experience. It is an educational experience to see and feel what we see and feel. The primary objective of architecture is to serve or satisfy human needs. It will inevitably establish a connection between built areas and human senses. All of the senses bring a space to life. It cannot be accomplished solely through the creation of architectural functions. To obtain a richer and more meaningful experience, we must have all the other parts in place and utilise them.

2. AIM AND OBJECTIVE

To study the different accessible elements such as colour, texture, and their roles in architecture, to research the architects from across the world and how they have developed elements, and to obtain knowledge about constructing a sensory space through main and secondary case studies. This research paper will focus on the design of architectural features and how it enhances the human experience of architecture.

3. PHENOMENOLOGY – THE FIVE SENSES AND ARCHITECTURE

Architecture can only be found in places that are inhabited by humans. When designing a space, it is the responsibility of an architect to give first consideration to the connections and relationships between people. This is produced by the senses working in conjunction with one another or beyond, and as a result, these are the five crucial resources that architects need to identify change. The human experience is enhanced by these senses, which allows humans to access their memories.

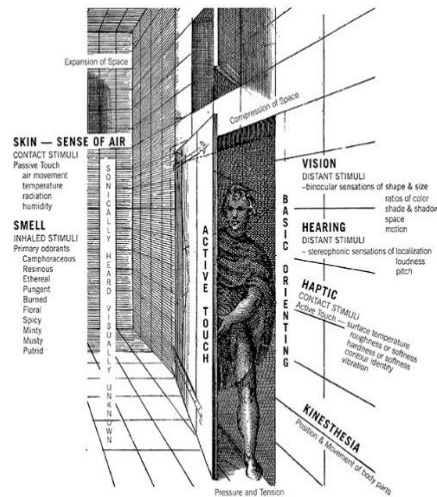


Figure 1: Joy Monice and Frank Vodvarka, Ranges of the senses, from the Sensory Design, University of Minnesota Press.

(Source: https://issuu.com/sdshivamdhanan/docs/21112020nggcad16225_final_report)

Phenomenology is an experience; more specifically, it is an experience that is produced by the materials, components, and sensory qualities of an object. The phenomenology of architecture includes the capacity for multisensory experience as one of its features. Each of the following: the eye, the ear, the nose, the skin, the tongue, the bone, and the muscle have the capacity to measure the characteristics of substance, space, and scale. According to the principles of architecture, developing a more robust sense of one's position in the world might ultimately result in a more robust sense of one's own identity.

3.1 SIGHT AND ARCHITECTURE

The primary sense, which helps us perceive light, form, and colour, serves as an important instrument in building. Buildings can only be understood via the use of the sense of light. Only the power of vision can make any architecturally built environment a success. This can be accomplished by employing materials and adding colour to various elements, angles, shapes, and so on.

Japan's "Art Island" - a timber-clad structure that plays with our perception of "seeing" The "Backside of the Moon" by James Turrell is a pitch black area that adjusts our vision to the dark and allows us to see through it.



Figure 2: Backside of the moon – by James Turrell

(Source: <https://architizer.com/blog/inspiration/collections/the-architecture-of-perception/>)

3.2 TOUCH A BUILDING'S SKIN

Buildings, as a palpable part of architecture, are all united physical form and architecture tactile. "A building's handshake is the door handle." – Juhani Uolevi Pallasma, a Finnish architect. The structure is recalled by what we felt inside and what we touched, such as the floors, textured walls, wood grains, and so on. The choice of appropriate materials can create an emotional relationship between the building and humans.



Figure 3: Hazelwood School Glasgow

(Source: <https://architizer.com/blog/inspiration/collections/the-architecture-of-perception/>)

Architect Alan Dunlop created Hazelwood School in Glasgow for children with dual impairments to give them the independence to navigate about the school using their sense of touch. Hazelwood is a public school that teaches children and adolescents with severe and highly complex needs life skills. To the south of Glasgow, it is situated on park ground within a clearly designated neighborhood and building conservation area. Glasgow City Council organized a competition to pick an architect, and six were invited to submit initial concepts for the architecture of the school and outline their strategy for its development on the parkland site. Alan Dunlop triumphed in the contest. 54 kids with multiple disabilities, ranging in age from 2 to 19, are served by the school. Acute vision impairment, hearing impairment, mobility impairment, or cognitive impairment are all present in some combination in each student. All of the students are autistic, which means that none of them will ever be able to live completely independently or without support.

3.3 SMELL IN ARCHITECTURE

Every scent has a place in our memories that we associate with it. Example: The standard statement followed by a space is "It smells like a hospital." Every place has a distinctive smell, some of which are accidental and some which are developed on purpose. They develop a full brand experience and also cause the design's behaviour.

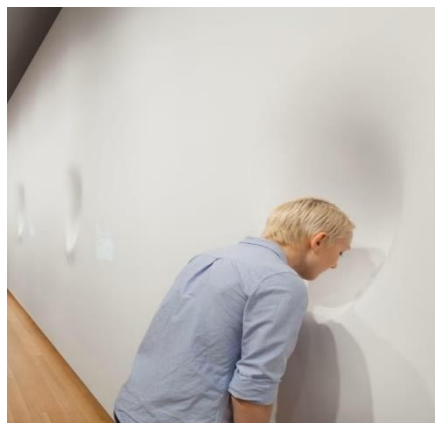


Figure 4: The Art of Scent, Museum of Art and Design, New York City

(Source: <https://architazer.com/blog/inspiration/collections/the-architecture-of-perception/>)

Diller Scofidio + Renfro's installation at the Museum of Art and Design is the first exhibition to focus on fragrance as an art.

The design was done to elicit memories using the sense of smell by creating dimples and pleats on the walls. The Art of Scent is one of the first museum exhibitions to focus on the olfactory arts. Perfume design has been ignored historically. Novel technology has led to new materials and methods throughout the recent century. Fragrance design has become a global craft. The Art of Scent focuses on 12 key scents. To address the sensation of smell, which is rarely introduced in museums, the design eliminates all references to perfume packaging and ads. Visitors enter a white gallery with 12 alcoves. Leaning against the wall releases fragrant air and triggers sound and haunting message displays. In a second, smaller exhibition, a 13-foot glass table anchors 24 suspended jars containing the same 12 pieces in liquid form. Visitors can compare and discuss their olfactory sensations and learn about scent creation. Diller Scofidio + Renfro and Chandler Burr collaborated on a scent installation for their 2012 exhibition, The Art of Scent.

3.4 SOUND – AN INVISIBLE ARCHITECTURE

Without seeing, sound can help us comprehend the area, its purpose, and its components. Most of the time, sound is concerned with noise and how to get rid of it. On the outside, acoustical alterations can have a significant impact.

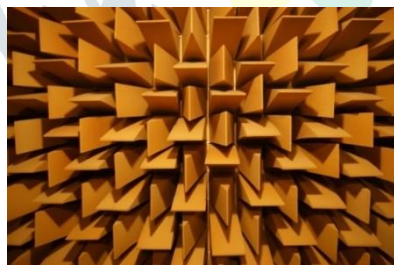


Figure 5: Anechoic Chamber, South Bank University, London

(Source: <https://architazer.com/blog/inspiration/collections/the-architecture-of-perception/>)

At an anechoic chamber, all previously unheard sounds, such as the heartbeat and perspiration, become audible; the foam wall absorbs all sound and heightens our awareness of each and every sound in the room. The Anechoic Chamber (anechoic meaning echo-free) is a specialized facility that has been meticulously designed and constructed to attain near-perfect silence. Within the chamber, no external sound nor sound reflections from internal room borders are permitted.

Almost full acoustic isolation is achieved by constructing a "box within a box" out of extremely thick concrete walls, 70cm-long foam wedges, and massive, heavy soundproof doors. The inner box is set on springs to prevent vibration transfer from London Underground trains operating beneath the chamber. The suspended floor is built of a metal grid so that equipment weighing up to 50 kg can be weighed. This chamber permits precise determination of sound power levels, measurement of frequency responses, and the creation of pristine recordings. Later processing of recordings can create audio replicas of virtual places.

3.5 TASTE – IN ARCHITECTURE

Touch creates a taste experience. Taste evolves oral sensation. A sense of taste has a story connection with buildings. Using different colors can make us recall taste of character, depth and beauty of space.

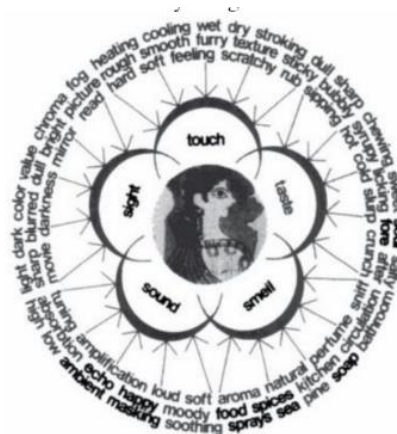


Figure 6: Demonstration of all tangible and intangible things that we perceive from our senses.

(Source: https://issuu.com/sdshivamdhawan/docs/21112020nggcad16225_final_report)



Figure 7: Chocolate Room, American Pavilion, Venice

(Source: <https://architazer.com/blog/inspiration/collections/the-architecture-of-perception/>)

The chocolate room's "wallpaper" was made by American artist Edward Ruscha in 1970 by silk-screen printing 360 sheets with Nestlé chocolate, first produced for the 35th Venice Biennale in 1970. The American Pavilion's chocolate Room featured 360 screen prints made from Nestlé's chocolate.

4. SENSORY DESIGN IN ARCHITECTURE

Humans have a dynamic relationship with the world around them. Consciously and subconsciously, the human body and the built environment interact. The human experience is shaped by the way in which these senses engage with architecture. Understanding this primary tool of architecture can help us appreciate the significance of sensory design in the built environment. The table 1 gives the idea projects with the application of sensory design in architecture.



Figure 8: Bruder Klaus Field Chapel (Source. <https://www.archdaily.com/106352/bruder-klaus-field-chapel-peter-zumthor>)



SENSE	BUILDING	STIMULUS	ARCHITECT	INFERENCE
Vision	Back side of the moon, Naoshima (Figure 2)	Timber cladding, pitch black wall	Tado Ando	The darkness blind us and then our eyes adjust to it. This design shows how darkness can create a beautiful experience.
Touch	Hazelwood School, Glasgow (Figure 3)	Wall cladding, linear plan	Alan Dunlop	They were designed for visually impaired to be independent and they achieved it.
Smell	The art of scent, museum of art and scent, NYC (Figure 4)	Fragrance	Diller Scofidio, Renfro	This building focuses on fragrance as an artist medium than just a product
Sound	Anechoic Chamber Bank University, London (Figure.5)	Foam boards	London South Bank University	The foam board absorbs every little sound, staying in the room for few minutes we could be aware of our own body
Taste	Chocolate room, American pavilion, venice (Figure 7)	Chocolate silk screen	Artist Edward Ruscha	This room creates euphoria to the taste buds
Vision, Touch	Bruder Kaus Field Chapel Wachendorg, Germany (Figure.8)	The floor with molten wax, lead and tin.	Peter Zumthor	The building entry creates visual experience, the floor creates a mirror effect with rain water adding beauty to the space.
Taste	Cision Chicago Office (Figure.9)	Colors	East Lake Studio	The brown color interiors make us feel like coffee.
Vision, Touch, Taste, sound	The alter of the Loyola Chapel, Thiruvananthapuram, India (Figure 10)	Exposed brick, IPS flooring, brick jaali	Laurie Baker	The design creates a great visual experience and tactile feeling of the space
Vision, touch, taste	Salk Institute Of Biological Study, USA (Figure 11)	Material, shadow, concrete texture, water	Louis Isadore Kahn	The design shows balance in façade , history and mystery in interior
5 senses	Garden Of 5 Senses, Delhi, India (Figure 12)	Colors, material, leaves, rocks, flowers, water body, sand	Pradeep Sachdeva	All the senses is provoked using different landscapes and allowing visitors to enjoy.



Figure 9: Eastlake Studio (Source. <https://www.archdaily.com/944073/eastlake-studio-provocateurs-of-interior-design-technology>)



Figure 10: The alter of the Loyola Chapel (Source <https://www.architecturaldigest.in/content/fathers-day-grandsons-tribute-grandfather-laurie-baker/>)



Figure 11: Salk Institute of Biological Study (Source <https://www.archdaily.com/61288/ad-classics-salk-institute-louis-kahn>)



Figure 12: Garden of Five Senses (Source. https://www.archnet.org/sites/6628?media_content_id=71622)

5. CONCLUSION

Architecture should primarily cater to the five senses. A person's senses include their ability to see, smell, taste, and hear. Parameters and elements give buildings harmony and depth. This paper sheds light on how the human senses and human perception are related to architecture and design. The information presented above is useful for gaining a firm grasp on the terminology used in the study and gaining a more holistic understanding of the principles behind multi-sensory design in architectural construction.

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