

SENSORY DESIGN – SOUND & TOUCH

Pankaj Narnolia
ar.pankajn@gmail.com
Amity University Chhattisgarh

Ar. Minakshi Rajput Singh
ar.minakshisingh@gmail.com
Amity University Chhattisgarh.

ABSTRACT

The concept of planning space is one of the main highlights in design. As of late, the idea of space is extraordinary which manages the difference between a change of perception and movement of the body, opened another viewpoint of review design and space. But in terms of user experience, let alone space is not responsible- rather the emotions affiliated to the space are responsible. Emotions in a space can be triggered by our senses, which means designing a space is very important and challenging yet very simple if we inculcate the sensory design into it. This paper is to investigate the relation of- Sense of Space in architecture by studying Sound and Touch as a main sensory element. This study will assist in designing to target users as a whole. Not only by viewing the space, but the user can also be a part of the space by feeling every aspect of the surrounding. The standards of this study will consistently assist with showing the potential bearings for developing the architectural design.

1. INTRODUCTION

Sensory Design is the application of sensory elements (like- Touch, Smell, Sound, Vision, and Taste) into the design. An interior or exterior consists of form and space when enclosed through the structure. Spaces are yet modified to their extent to give a sense of completion in terms of emotions by insertion of sensory elements to it.

2. ROLE OF SENSES

As said by Justine Bourland, *“Architects who understand their users’ needs and feelings design successful buildings.”*

The interaction between the environment and body is constant and dynamic. When we experience a space, we experience it through our senses which are five in total, Vision, Sound, Smell, Taste, and Touch.

These five different resources let designers explore and innovate, many a time these five different resources are often forgotten by designers attempting to lease a space that only stimulates one, maybe two senses.

By targeting the senses through each modality, an architect can unleash the potential of architecture to the maximum.

2.1 Vision: Sight is the primary sense of all

It allows the user to perceive light, form, and color. The user uses the vision instinctively and subconsciously to determine the spatial structure around him.

Vision can also be manipulated by factors such as Distance, Scale, Color, Light, etc.

2.2 Sound - Invisible from space

As said by Peter Zumthor, *“I remember the sound of the gravel under my feet, the soft gleam of the waxed oak staircase.”*

A change in minute acoustics can affect the entire experience of space.

Acoustical change depends solely on reverberation time, like, low ceilings can be heard differently from the high ceiling, Open or closed doors, nearby walls, columns, design elements all have their own reverberation time, and resonance. Sound is something that is invisible to the eyes but is essential for the feel of

space. Sound enhances the spatial experience of space. E.g., carpets create an aural sense of warmth, where marble floors and glass walls convey an aural sense of coldness.

By designing something for our 'ear' we can improve our health, productivity in the workplace, and focus on studies.

E.g., flowing water, walking on pebbles, the sound of the wind, etc.

2.3 Smell – *The hidden resource*

Smell triggers memories, to which we associate a spatial quality we already experienced in the past. The smell comes before sight; in many situations, we look in the direction from where we smell and attract to.

As we say, it smells like a home or office, or hospital. This also triggers the emotion within. The sense of smell can be manipulated to archive an increase in certain emotions to create a completely brand-new experience.

While I talk about smell, it is beyond air freshener but means utilizing the fragranced construction materials to create a naturally scented environment. Woods like juniper wood, cedar of Lebanon, atlas cedar, cypress, thuja, or laurel emanate a particular scent and can be used for furniture or in construction. Also, indoor landscaping can be used for scent in the structure.

2.4 Taste – *The untapped resource*

Taste is evoked by vision, certain colors and delicate details evoke oral sensations. Warm, Cool, Bright, Dull, colors all give a different sensation of taste. The sense of taste is strongly related to spaces such as grocery stores, café, restaurants, bakeries, hospitals, gardens, etc.

These features of taste can be used to create a space using color, fragrance, etc., to recall taste from experience to add depth and character to space.

2.5 Touch – *The sense of hepatic*

Touch helps to stimulate the haptic nature of an object. Through the tips of our fingers, we experience the unevenness of material, texture, temperature, etc., and feel the object or the environment completely different.

By combining the sense of vision and touch the user, gets the entire nature and estimation of space around him.

Materials come in a variety of forms, which are polished, raw, textured, warm, cold, etc., some are designed to interact with the surroundings. As touch caters- texture, weight, density, heat, etc., a designer can experiment with materials to stimulate the sense associated with them.

3. HAPTIC NATURE

Touch is thought to be the first sense that humans develop, according to the Stanford Encyclopedia of Philosophy. Touch consists of several distinct sensations communicated to the brain through specialized neurons in the skin. Pressure, temperature, light touch, vibration, pain, and other sensations are all part of the touch sense and are all attributed to different receptors in the skin.

Touch isn't just a sense used to interact with the world; it also seems to be very important to a human's well-being. For example, touch has been found to convey compassion from one human to another.

Touch can also influence how humans make decisions. Texture can be associated with abstract concepts, and touching something with a texture can influence the decisions a person makes, according to six studies by psychologists at Harvard University and Yale University, published in the June 24, 2010, issue of the journal Science.

"Those tactile sensations are not just changing general orientation or putting people in a good mood," said Joshua Ackerman, an assistant professor of marketing at the Massachusetts Institute of Technology. "They have a specific tie to certain abstract meanings."

4. MATERIALS

The creative use of textures and classic textured materials will add fantastically refined depth to a style. Despite powerful patterns being on-trend, the utilization of predominantly gentle, monochromatic color schemes isn't likely to lose its place during a substantial proportion of the hospitality sector. Varied the feel of a finish adds character and quality

while not sacrificing the flexibility of a neutral shade.

Keeping in step with the trend towards customizable spaces, textured little furnishings and linens – napkins, table coverings, cushions, throws, spreads, rugs, etc. – enable end-user to associate intimate interaction with space. Individuals are drawn to “touchable” materials and soft textures. A buttery leather complemented by a warm, nubby knit subtly engages bit and provides a touch of warmth and welcome.

As a matter of usefulness, a texture may be utilized in part of architectural or structural components in shaping space. Particularly in large, or open plan areas, refined changes in flooring or wall coverings will delineate spatial divisions and scale back the perceived scale of the house whereas not putting limitations on future reconfigurations. Carpet texture can even be used to direct foot traffic.

5. HAPTIC FEEDBACK

Haptic feedback is the use of touch to communicate with users. Haptic feedback changes this by simulating the sense of touch. Not only can you touch a computer or other device, but the computer can touch you back. It's entirely a new way for machines and humans to communicate.

5.1 Working of Haptic Feedback

The tactile sensations most people think of when they say "touch" are part of what is known as the somatosensory system. This encompasses a huge variety of sensations, not just sensations such as vibration or pressure, but also things such as pain, temperature, and the position and movement of your body in space.

The somatosensory system includes at least 12 specialized types of receptors. Each sends different information to your brain: one type sends information about vibration, one about pressure, one about pain, and so on. These receptors are all over the surface of your body, and inside it, too. The average adult has 3 million pain receptors alone.

Classic Textures

We are seeing rich, classic textured materials such as brocade, velvet, and leather juxtaposed to modern forms for a more contemporary presentation. The recent embrace of craft and culture brings interesting weaves to the fore while natural materials keep their place as the sustainability movement is universally embraced. Biophilic cotton felts and knit fabrics fulfill an innate affinity for tactility and can build a feeling of wellness within a space.

If a simpler approach is preferred, pleats and folds elevate the style of basic window dressings. Newer technology allows for high-definition dyeing and surface detailing of carpeting and rugs while accommodating a variety of budgets better than ever.

5.2. Haptic Feedback Technology

While the tiny devices that create vibrations in a mobile phone are probably the best-known haptic technology, there are many other ways to simulate touch. Some, such as tactile sensations in mid-air and do not even require the user to be in contact with a physical surface.

Today, haptic technology ranges from the vibrations in mobile through wearables, controllers, and mid-air haptics, all the way up to high-end exoskeletons and full-body suits that look like something out of Ready Player One (and which, today, are largely confined to military and industrial applications). Consumer game consoles, such as the new PlayStation 5 and the Nintendo Switch, include sophisticated haptic feedback as standard. Haptic technology is found in everything from automotive to theme parks, from marketing to military training.

6. Sound and It's Working:

This sense works via the complicated labyrinth which is the human ear. Sound is funneled through the external organ and piped into the external auditory canal. Then, sound waves reach the

eardrum. This is often a thin sheet of tissue that vibrates once sound waves strike it.

The vibrations travel to the center ear. There, the sense modality ossicles — 3 tiny bones referred to as the hammer, auditory ossicle (anvil), and stapes (stirrup) — vibrate. The stapes bone, in turn, pushes a structure referred to as the fenestra in and out, causing vibrations to the organ of Corti, in line with the National Library of Medication (NLM). This spiral organ is that the receptor organ for hearing small hair cells within the organ of Corti translate the vibrations into electrical impulses. The impulses then travel to the brain via sensory nerves.

7. CASE STUDY:

7.1. Falling Water

Falling Water is a weekend residential project designed by sir Frank Lloyd Wright, Situated in Mill Run, Pennsylvania, United States. This masterpiece was completed in 1937, which stretches over approximately 9.1mt. waterfall and is an attention seeker in front of everyone. This structure consists of two parts, i.e., the main house which was built between 1936 – 1938, and also the house for guests which was completed in 1939. This structure helps in redefining the relationship between man, architecture, and nature. In terms of sound stimulation, this

People retain their sense of balance as a result of the auditory tube, or pharyngotympanic tube, within the tympanic cavity equalizes the atmospheric pressure with atmospheric pressure within the atmosphere. The proprioception complicated, within the internal ear, is additionally vital for balance, as a result of it contains receptors that regulate a way of equilibrium. The internal ear is connected to the cranial nerve, which carries sound and equilibrium data to the brain.

particular structure has acquired it naturally. The waterfall flowing under the structure has a vivid range of its acoustics, from anywhere in the house you can't see the falls but can hear it perfectly. This allows the residents of the house to calm and unite with nature by being inside a weekend house.

Also, the materials used here are some natural stones from the location itself or structured by slightly rough textured materials to give a sense closer to unevenness and nature.

8. CONCLUSION:

Play with sensory elements in space can provide a dramatic experience to space.

Un sighted people can also understand and mentally map the space effectively.

Senses play an important role to deliver the narrative to the user.

Modulation of sound and texture roughness can alter the entire feel of space.

When added sensory elements (sound and hepatic) into user interfaces and spaces, it is also about reducing task completion time and improving accuracy, which will eventually lead to a healthy and productive life.

The principles of this study will continuously help to indicate the possible development of the architectural design. A kind of design that has all dimensions of user experience.

By the proper study and implantation of sensory design, it will give an emotion to the design, Direct the user to interact throughout space. Understand and experience the space by being the very part of it.

9. ACKNOWLEDGEMENT:

I would like to thank all who helped me a lot in collecting different facts, collecting information, and overseeing me from time to time in making this research project, regardless of their busy schedules,

they gave me diverse thoughts in making this research paper unique.

I would like to express my gratitude to my faculty **Prof. Minakshi Rajput Singh** and our **Director Prof. Vidya Singh** and all other faculties those who guided me in this golden opportunity to do, this infinite research paper on the topic '**Sensory Design – Sound & Touch**' which also help out me in undertaking a lot of research and I came to be familiar with this about so many new sights of vision. Secondly, any effort at any level can't be adequately completed without the support and guidance of my parents and friends who helped me a lot in finishing this research paper within the limited time frame.

10. REFERENCES:

1. Metropolis Magazine as "Architecture You Can Smell? A Brief History of Multisensory Design".
2. D.K. Ching Architecture: Form, Space, and Order.
3. Hetao Hou and Li Tian- Art of Light and Shadow Reflected in Architecture.
4. Hegarty M- The cognitive science of visual-spatial displays: Implications for design.
5. Cho J- An investigation of design studio performance in relation to creativity, spatial ability, and visual cognitive style.
6. Liao K.- The abilities of understanding spatial relations, spatial orientation, and spatial visualization affect 3D product design performance: using carton box design as an example.
7. -Álvarez R & Duarte F- Spatial Design and Placemaking: Learning from Video Games.
8. Elissaveta Marinova- Multi-sensory design – building for all senses.

