



Acoustics between “Engineering,” “Architecture,” and “Interior Design”



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Introduction

Acoustic is the science of sound communication. Dealing with it could be through the usage of the devices to enable its transmission between the source and the receiver in question. Therefore it is an engineering field. In another hand, acoustic is the science and art of the well-selected materials to enhance its propagations within the spaces. These materiality schemes, quantities, qualities, and locations, effect on the quality of the sound behavior within any interior, and then it is interior design tool to reach a well-designed built environment. Acoustic will never occur without being in a building; we need architecture to apply the acoustic. Hence, the acoustics field varies between the engineering, architecture, and the interior design. The following discussion will clarify the three sides that occurs in the acoustics study, its importance, and the applications to resolve to which side we should consider the acoustics.

Discussion

When exploring the sound transmission, we should start from the early Greek dynasty, where the Coliseum was the great witness of the science and art that appear in the building design. The architecture of the building enables the sound to reach all the attendees, with no echo, using the physics and mathematics of the building materiality and the building shape and form. It was then the first asset of an architectural layout of a well acoustical design of a space, where the shape of the building, the formal composition, and the scale of the stage in accordance to the leveled hall flooring that succeeds the functionality of the spaces. Each audience will see the stage level in perfection, as direct results, will hear the performance at its best. The leader of the acoustics, then, is the architect who shaped in a specific layout to reach the excellence of the space functionality. Another example, in a next civilization, in the Islamic era, we found the magnificent Ali Qāpū palace of the early Safavid period. The famous “six-story hall” or the ceremony hall designed with the unrepeatable wooden horns coves to vibrate the religious music to amplify it at its glance. In this case, the interior design is the leader of the acoustics that creates with the materiality selections – properties and qualities – in addition to their positions in the acoustical space the required function. It

is considered then the acoustic as an interior design where the material scheme plays the main role. While in the modern life, especially after the invention of the electricity, the devices, which help the acoustic, take place in some spaces where the engineer is the maestro of equipping the building. The electrical engineer, who is a specialist in the acoustics, take advantage of the electrical devices and implement them within the interior to promote the appropriate sound level in the function in question. The system is very simple but rely totally on the electricity. The interior treatments within the spaces are to be absorbers, so the sound projected from the loudspeakers do the requested applications create no echoes. Then, and based on the projected materials, either music or speech, the loudspeakers project the sound with a studied timing – decimal from the seconds – to distribute the sound in the interior spaces without any encounters or echoes. The electrical devices are the main tool to design a space in an acoustical environment that suits the function itself. This technology invented through engineers in France for many decades.

Furthermore, the functions of space affect seriously on the acoustic. The five different categories of the functionality of the space are:

- a. Spaces where it is vital to understand the speeches like in the Lecture Halls, in the Boardrooms, and in the Courtrooms.
- b. Spaces where the quiet background is necessary like the Hospitals, the Museums, and Classrooms.
- c. Spaces where the speech in privacy is the key of the functions like in the Clinics, in the Human Resources Offices, and in the Police Stations.
- d. Spaces where the public announcements need to be clear like in the Airports, Public Services, and Public Leisure spaces.
- e. Spaces where the music enhancement is at the glance of the function like in the Opera Houses, in the Studios, and in the Theaters.

Each of the five categories, mention above, need a special acoustical treatment to enhance or to reduce or even to isolate the different functionality of the spaces.

Conclusion

The acoustic is, through civilization, an important topic that forces humanity to consider in their life. People found, by their human instinct, that the sound is a vital tool to enable the correct communication. The sound is the proper tool that is manageable by a human, while the noise is the unwanted sound that we should avoid while dealing with acoustics. Engineer, Architect, and Interior Designer should take this responsibility when dealing with spaces of vital acoustic needs.

From the historical background and the design experience, the acoustic is a field where three of them play an imperative role, each by its importance. They all rely on the architect who should have the appropriate knowledge to enable him/her to create the ultimate shape and form of the building and the interior spaces as the indispensable background of any function. The architect should create the spaces with fully understanding of the function that will take place in the building. The Interior Designer, at same, need the full information to design the interior to promote these functions

using the proper material schemes in terms properties and qualities in the convenient positions to reach the acoustic in value. The Engineer needs to provide the Interior Designer with proper devices that will help to achieve the acoustical needs of the functionality of the space. The designer refers to the electrical devices in three different indispensable situations. Electrical, acoustical devices are obligatory in listening to the registered materials, to recording the events, and to the simultaneous translation in any official international gathering, like conferences and meetings. We need a well acoustical designed space by both the architect as layout and an interior designer as interior treatments. Three of them have an important role with the acoustic. Then no worries of having this complicated yet crucial topic in the three fields of study. Each need to understand the role of the others to cooperate in the real project when needed. Acoustic is engineering for the supplement's devices. Acoustic is architecture for the building shape and form. Acoustic is interior design as the materiality of the interior treatment regarding quality, properties, and positions. Acoustics are engineering, architecture, and interior design..



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