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Architects and Acousticians: are they able to understand each other?

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Good architectural projects need a suitable understanding between the various members of the design team. But can really people as different as an architect and an acoustician reach such an understanding? One is mainly concerned with the appearance of the building (and what it costs too!), while the other one usually happens to be concerned with plenty of non visible items. Does it mean that as long as it does not interfere with the architect's vision of space, it's acceptable? Each member has a goal to reach on the project. And more since regulations and labels are increasingly discerning. So, the point is: does the architect really understand and integrate the acoustic elements the acoustician gives to him? And, inversely, does the acoustician know the impact of his recommendations on the architect's work? Through her professional experience as an acoustic engineer and her education as an architect, the author submits in this paper a few illustrations of those points.

1 Introduction

Good architectural projects need a suitable understanding between the various members of the design team. But can really people like an architect and an acoustician reach such an understanding? They are concerned with different items and each one has different goals to reach on the project.

Since regulations and labels are increasingly discerning, they now have to work together more than before. But, communication is actually difficult between those two members of a team.

So, why are they thinking so differently? Do they really try to understand each other? How to make communication easier between them?

This paper is written to try to answer to those questions by approaching the education, the goal and the work of each one.

2 Who are they?

Architects and acousticians (engineer) both went through five years of studies before starting to exercise their job. The training course the architects did simultaneously featured scientific and artistic matters while the acousticians received a specialized education mainly focusing on scientific matters. The architects have broader knowledge in the domains of the building and the construction but to a less deep extent than the specialized engineers, such as the heat engineers, the structural engineers or the acousticians. The architect approaches the project in general and has to contact these specialists to answer, each in their own domain, the technical points which concern the project.

The acoustician is one of those specialists, although he has a rather wide knowledge in building connected to his job; his main concern is the acoustic quality of the whole project.

The architect exercises his job in an agency and on construction sites he is responsible for. The acoustician practices in an engineering consulting firm and, also, on the construction sites that he takes care of, which heralds here the first link between those two participants.

The working tools of the architect are mainly computer based. He has to produce various graphic pieces and written pieces which combine all the information of the project. As he is responsible for the good progress of the project, he has to be capable of combining all the data of the various participants in order to connect together the information and to communicate it to the whole team.

The acoustician uses computer tools too but also measuring instruments specific to his work. These tools allow him to perform a precise diagnosis of the technical points which concern him for the project.

For the architect, as for the acoustician, every project is unique. A new project requires to start anew all the steps every time, whatever the studied domain and the elements to be supplied are.

3 Why do they have to work together?

The architect doesn't have all the technical knowledge and cannot take the completeness of the project at his expense anyway.

It is why there are, as explained previously, specialists for every technical domain of a construction project.

As the architect is the main pillar of the project, it belongs to him to be in touch with all other participants, of whom the acoustician is a member.

Even if certain architects still try to by-pass the subject by working without an acoustician, it becomes harder and harder to avoid such a collaboration. Indeed, two important points are to be considered.

- First of all, as expressed before, every project is unique. There are no pre-established models which allow to assert in 100 % that such processing in such place will answer perfectly the acoustic requirements.

- Second, the regulations, the labels and the other certifications do not stop evolving. Every year new recommendations appear and the acoustic criteria are more and more present in texts. So it becomes inevitable that these two corporate associations meet and work hand in hand.

4 Why do they often experience difficulties in communicating?

Due to his multiple responsibilities, the architect is more often put under stress and more worried than the acoustician. This can make him more sensitive to the slightest element which could perturb the good progress of the project.

As the technical data are brought by specialized outer participants and as he has no knowledge of these data beforehand, the architect has to get ready to make all the elements coincide together although they come from different specialists. It is the difficult task which is often source of disagreement between the participants and concessions for some.

When the world concerns turn around the themes of the economy and the ecology, the acoustic quality of a project is not very often a priority, it even is a subject relegated to

the background. So, if a non-priority theme may disturb the good progress of the project, it becomes a source of conflict.

The acoustician, on his side, has a main objective: to make the project "acoustically completed" which means that it answers all the statutory acoustic criteria, and even in excess of that through a quest for acoustic comfort if necessary. Most of the time the acoustician is not conscious of the impact of his work on the progress of the project; more to the point he is not aware of possible interferences that his work can generate towards the other participants.

It happens sometimes, when the acoustician is informed about these disturbances that he remains focused on his target and does not worry about the other technical domains which are not his.

5 What are the efforts to be made by the Architect?

The architect often does not know but the choices he makes from the beginning of the project will have an incidence on the acoustic quality of the project. That is why he should not hesitate to call for an acoustician right from the phase of conception. The work of this last one is not only a check on a finished product, the acoustician also has the capacities to anticipate, to advise, to direct.

We don't see much today, nevertheless all the engineering consulting firms also propose their services as advisers.

The architect sometimes sees acoustics only as a constraint or a brake to his creation. Nevertheless the acoustician is not there to remove his baby from him, he is not going to go against the architectural choices, the volumetries or the colors. The acoustician is just going to turn to good account his knowledge in acoustics so that the project, such as it was decided by the architect, can contain the acoustic qualities required by the regulations, the standards and simply the human ear.

Furthermore, the proposed materials, whatever their use is, are more and more numerous, more and more insulating or absorbent, more and more thin and especially more and more affordable considering the growing competition. End stereotypes with drilled wood or with sub-ceilings in tiles of 60cm x 60cm. The range of acoustic treatment products has developed a lot over these last years. Renewable materials have been integrated, such as vegetable or animal fibers. The industrialists got organized, products are quickly available, their packaging is planned to optimize their use on construction site and especially the workers are more and more used to manipulate these products.

We still say that the acoustic quality costs a lot but in reality it is the absence of anticipation that makes it expensive. If from the beginning the diverse building materials, the insulations, the covers or the other forgeries-ceilings are not predefined and not integrated into the initial project following anticipated acoustic criteria, they do not go into the pre-established budget. It is necessary to add afterward, to report, to modify and to readjust elements. It is at this moment that it begins to present an additional cost. Nevertheless the current market proposes much more multifunction products: the dubbings become at the same time heat insulator, firebreak, acoustic insulating material and even absorbing material.

At the same time, some products presenting precise acoustic characteristics allow to free themselves from the other initially planned elements. For example, the implementation of an acoustic sub-ceiling saves up on the painting or on the filler which was envisaged in the ceiling, the treatment of the noises of shocks directly by floor coverings allows to eliminate sound screeds, etc…

To remove this idea of additional cost connected to the acoustic processing, we should not argue by the addition of elements but by the replacement of some of them. Also, the budgets must be established from the beginning with this notion of acoustics. Quite as the respect for the standards for disabled persons or for the thermal regulations, the acoustic quality is an integral part of the project and cannot, and must not, be relegated to the background.

Few architects know it, but they could express their creativity through acoustic criteria. As there are sound routes realized by some artists, the project could itself become one if the constructive choices and correctly chosen finishes are adapted to it.

6 What are the efforts to be made by the Acoustician?

The acoustician often is too much focused on his target; he sometimes forgets that he is not the only participant and that his choices can have important repercussions. An example among so many others: modifying the thickness of a dubbing can bring a loss of surface with a resultant disregard of the standards of accessibility to the handicapped persons. Beyond the consequences on the project itself, all the data supplied by the acoustician must be joined into the graphic pieces and into the written pieces; this represents a lot of working hours for the architect.

Over that, the acoustician doesn't have to deprive the architect in his constructive and architectural decisions, he must, as best as possible, be able to bring elements which can become integrated easily into the project or, if need be, to propose several alternatives until satisfying all the participants. So, it is important for the acoustician to be in touch with the other members of the team and that they communicate together, even if that implies to approach subjects which, at first sight, did not concern the acoustic quality of the project. During these exchanges, it is important that the acoustician does not speak too scientifically to the various participants. This domain which is his is not necessarily known by all, it is preferable to express itself simply and by giving concrete examples to facilitate the dialogue. And more if his discipline is not in the front line.

Generally speaking, the work of the acoustician is not limited to indicating acoustic performances to be obtained in such or such place, he has to accompany the architect in his choices, direct him and advise him if need, make him know about new products or new approaches.

To facilitate his integration in a team, the acoustician has to be interested in the project in its entirety, in the other participants and in what they make. He has to go to the front things sometimes to be able to pass on his knowledge because if he stays in his corner nobody will come to care about what he makes.

7 Conclusion

Even if one may again and again find inflexible people, the important place that is setting the acoustics within a project now allows, though not without difficulty, a link between the architects and the acousticians. Nevertheless, for this collaboration to be established as best as possible, it becomes urgent that each of them makes a step towards the other one.

They certainly chose different careers and consequently different places in the team but both work for the same purpose: to bring to a successful conclusion the project and to achieve the satisfaction of everybody.

So, they have to learn to discover their respective jobs, to understand them and especially to respect them. Each of them gives a lot for a project and there is no way that one or the other is hurt.