

Design for quiet living

A Science and Technology Studies perspective on architecture and noise mitigation policies

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Summary

Environmental noise is gaining increasing attention from both the scientific community and public opinion, as its effects on health and well-being are nowadays well-known. Silence is seen as a good to be preserved and restored, particularly in an urban context, where the pressure of densification often conflicts with the need to protect sensitive receivers from various noise sources.

The role of architects and planners in finding solutions to such conflict has been increasingly acknowledged, and a considerable number of studies on possible solutions has been developed.

Such studies mainly evaluate different design and technical solutions with respect to the reduction in noise levels that can be achieved. Many solutions are tested in the same simplified context (usually virtual or scale models) and knowledge is developed through large quantities of data from repeated experiments in a controlled environment, within the typical paradigm of experimental science and technology.

What remains therefore underresearched is the integration of such solutions within the complexity of real transformation processes, in which many different stakeholders and potentially conflicting requirements are involved.

In order to assess the issue, this work claims, it is necessary to adopt a paradigm that is closer to the one of social sciences and technologies, engaging with close

observation of real case-studies, investigating and reconstructing the thick mesh of stakeholders, laws and requirements that influenced the process.

In order to do so, the view provided by Science and Technology Studies (STS) is adopted. Previous literature in the field that focused on architecture design processes, and in particular on the role of codes and metrics, is examined to formulate research questions, shaping the lenses to observe selected case-studies.

Moreover, indications for maps and schemes that can help the investigation and representation of the findings are defined, on the basis of previous studies that tried to answer to the STS request of new “visual vocabularies” to visualize the complexity of design processes.

The case-study of an urban transformation in Turin is then explored through visualizations driven by the research questions and indications derived from the background literature. Visualizations are defined through an iterative process in which data collection, analysis and visualization mutually inform each other.

The visualizations are then tested with respect to their legibility, accuracy in describing the process and agency in enhancing new perspectives on the process, interaction within stakeholders and a hypothesis on the future applicability of the maps. The evaluation is done through a focus group with involved stakeholders, following the *critical proximity* concept.

The visualizations are also tested through their use in the investigation of a project in Utrecht, where outdoor noise mitigation ~~is~~ has been tackled by law since the Eighties. The aim is on one hand to discover what can be learned on noise mitigation solutions and policies in the specific context and on the other hand to test the applicability to different case-studies of the maps developed during the investigation of the Turin case-study.

Results of the case-studies analysis pointed out the relationships between human and non-human actors, policies, documents produced and controversies emerged during the process and modification of the building itself. This allowed to derive empirical evidences supporting what stated by previous literature.

In particular, the conditions under which noise policies can be effective in enrolling designers in the definitions of noise mitigation solutions and their succesfull integration with other requirements were put in light, deriving suggestions for possible future policies modifications. Moreover, it emerged how noise policies and verification modalities can influence the design process as well as be influenced by it, hence supporting the request of a much-needed body of researches that will deepen the understanding of how such actors are involved in real design processes.

The visualizations defined in this study resulted to have a good legibility and efficacy in promoting new perspective on the process by actors involved in it, as well as interactions and clarifications among such actors. They also resulted to be suitable for the application on a different case study from the one for which they were initially designed. They can therefore be considered as a good starting point fo future researches investigating similar cases, although some necessary improvements as well as the need for more interactive visualizations emerged.

Indications for future works and research directions are therefore outlined, as a way to reflect on the potential future scenarios that this work may open, and therefore, ultimately, on its possible value within the research panorama.

Far from presuming to be exhaustive, this work aims to be a very first step in the construction of a *body of knowledge* on the many different contexts in which noise mitigation issues affect urban transformations. It hopes to work as a pilot study for future works adopting a similar perspective, crafting devices to help the construction of such a body of knowledge that will support more informed future choices by involved stakeholders.