The new ISO-standard on "Soundscape" - Maximizing the benefit for the Architectural design process

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ABSTRACT

The new ISO 12913-1 introduces a conceptional framework for the "Soundscape" approach and refers to "factors relevant for measurement and reporting of soundscape studies, as well as planning, design and management of soundscape". This emphasizes a common ground to Soundscape for Acousticians and Architects/Urban Designers (among others): for Acousticians to investigate sound qualities in relation to their specific context, and for Architects/Urban Designers to pro-actively implement sound qualities into their designs. However, both professions usually come from fundamentally different perspectives: Acousticians rather act as "analysts": they observe specific environments in order to derive findings, such as patterns, generalizations or rules; Architects tend to do the exact opposite and act as "synthesizers": they use patterns, generalizations and rules, in order to integrate them into the design of a specific environment. Consequently, the expectations and the outcome of a "standardization" approach may differ significantly. The paper discusses the underlying triangulation principle of the soundscape-approach based on "people-context-acoustic environment" against a proposed similar triangulation of the Architectural/Urban design process based on "programme-context-idea". It explores the potentials of the Soundscape approach from an Architect's view and the way it could be enhanced by an interdisciplinary approach as anticipated in the new ISO.

THREE PREMISES ON THE SOUNDSCAPE APPROACH FROM AN ARCHITECT'S POINT OF VIEW

The word "soundscape" consists obviously of the words "sound" and "scape". From an Architect's point of view, the connotation with "landscape/-scape" suggests that 50% of a soundscape is about the place: the location itself i.e. its visual performance and its visual experience. (The definition of "Soundscape" according the new ISO-Standard will be dealt with later and will be referred to further below.)
Architecturally speaking, creating a good location is, among other aspects, about "sensing" a place, about getting inspired and informed by relevant case studies and about contributing to the existing community or neighborhood of a new project.
It is suggested here that the following three premises lend themselves to the soundscape approach:

Premise 1:
With regard to acoustics, the soundscape approach does not deal only with noise abatement and sound qualities, but with the specification of individual sound locations. To give an example: most people will easily recognize the stereotypical sound of a subway train, even without knowing about the context. However, the sound quality of the London "Tube" or the Parisian "Metro" will be described differently according to its technology, and it will be perceived differently according to its architectural and cultural context. The perceived sound quality is therefore a matter of the location and of the "sense of a place".

Premise 2:
With regard to architecture and urban planning, the soundscape approach is not engaged only with fulfilling noise abatement and sound quality standards, but with new sound benchmarks. To stick to the example of the underground: When planning a new subway system, one will minimize any unwanted noise. At the same time, one should imagine and explore the potential of desirable sounds by good sound case studies. Should the new metro system rather sound like the New York "Subway" or the Stockholm "Tunnelbana"? The aspired sound quality is therefore a matter of benchmarking and of acoustically informed "precedents".

Premise 3:
With regard to the audiovisual experience and its social dimension, the soundscape approach is not engaged only with physical properties and their human response, but with the investigation in how far individual and collective responses to sound and noise can provoke and help develop innovative concepts for public spaces and for buildings.
Are there any tangible conclusions from the soundscape approach that can inform architectural design? The ambition to identify and to enhance a collectively appreciated sound quality at a specific location is a matter of "community development".

HOW CAN THESE PREMISES LINK UP WITH THE NEW ISO-STANDARD OF SOUNDSCAPE?

With respect to the new standard and its triangulation of "people-context-acoustic environment", some congruency with the described premises can be identified:
A good sense of a place will include the reflection on and the response to the acoustic environment.
The critical review of precedents correlates with the analysis of the context, by identifying patterns and typologies
And finally, a successful design proposal will enhance the community development i.e. will take people's experiences, needs and expectations into account, with regard to the project itself and its context.
In other words: the proposed triangulation in the new ISO-Standard and its wording are well suitable for the communication with architects and their design process. The definition and the conceptual framework of "Soundscape" as outlined in the new document can help designers to imagine and develop their projects. However, this is not an easy task: ISO-Standards are edited to "ensure that products and services are safe, reliable and of good quality." Consequently, the new ISO-Standard on Soundscape explicitly aims at overcoming an "idiosyncratic and ambiguous" use of the term Soundscape and to clean up the "diversity of opinions of its definition". In contrary, while Architects are used to work with a tremendous number of guidelines and standards, architecture in its full spectrum depends on and emerges from the diversity of opinions; and even more: the design process of any artifact demands a considerable amount of idiosyncrasy.
For Architects to benefit from the Soundscape-approach, it is therefore useful to have a look at a generic model of the Architectural design process (needless to mention that there is no standard for the design process and that the following approach is not free of idiosyncrasy):
Similar to the triangulation model in the soundscape-standard, most architects and urban designers will agree that their design process can be described as the tripod of "programme-context-idea". It is argued here that the tripod of the Architectural design process and the triangulation of the soundscape approach can be combined.
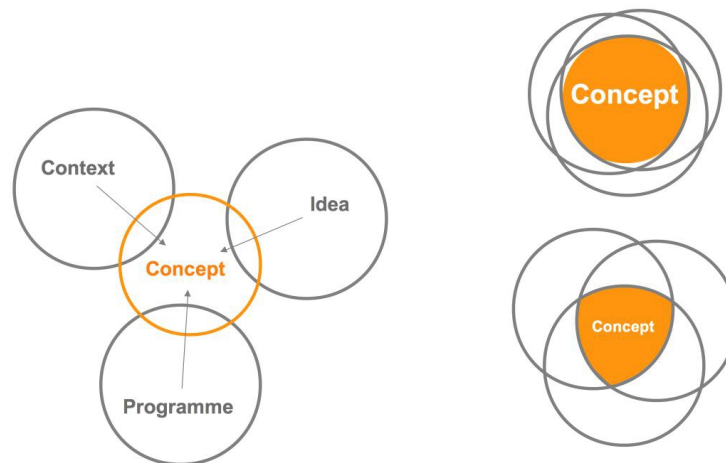

Image 1:
The Architectural design as a tripod of "Programme-Context-Idea": the more
congruency of idea, context and programme, the stronger the concept

Image 1 displays this tripod: The "idea" is to be scrutinized by the constraints of the "context" and the "programme", but it is also reared on their potentials i.e. the "sense of place" and the purpose and its functional requirements; the more congruency of the idea, context and programme, the stronger the concept, for all parts of the tripod will be in balance. It should be noted that there is no hierarchy between the three legs of the tripod. However, a concept that dismisses the programme will be dysfunctional, a concept that ignores the context will cause alienation, and a concept that has no strong idea behind it, will lack character and charisma.
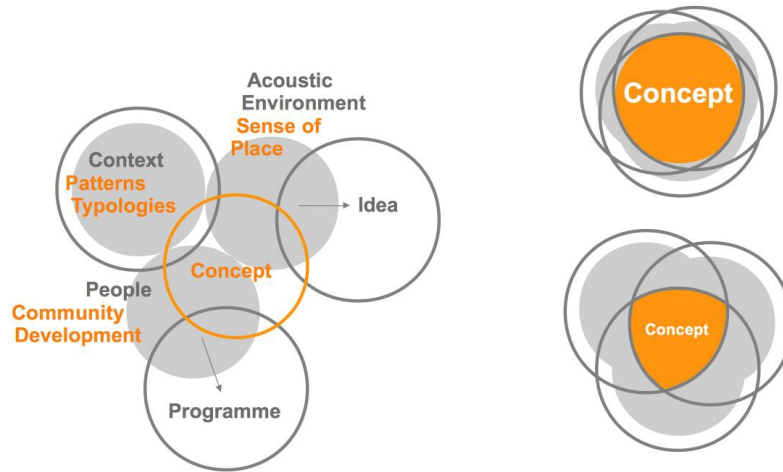

Image 2:
The Architectural design process and the soundscape triangulation combined,
to inform and to strengthen the concept.

Image 2 shows the integration of the soundscape triangulation into the tripod, which adds to the congruency and which can inform the idea and and strengthen the concept. The soundscape approach is hereby not only a matter of rigorous scientific analysis but a design objective.
This is not new by any means. Murray Schafer outlined in 1977 that soundscapes are amenable to analysis and design (Schafer 1977). Brown and Muhar argued in 2004 that "Acoustic design of outdoor space should be seen as complementary to 'noise management', 'abatement' or 'control'." They state that "Soundscape planning is not about quieting all [...] spaces. Instead, it is directed at special places where the opportunity may exist, through appropriate management of sound, to increase human enjoyment" (Brown/Muhar 2004). In this light, a "standardized" soundscape definition, its methods and measurements (part 2 of the ISO-STANDARD to follow) will be considerably more relevant if it explicitly addresses designers and if it provides clues for soundscape implementation, or better say: practical soundscape design tools.

TOWARDS SOUNDSCAPE DESIGN TECHNIQUES

In the discourse of the Soundscape debate over the recent years, numerous categorizations of sound perception have been discussed, e.g. "event sequences vs amorphous sequences" (Maffiolo 1999), "natural, human, mechanical" (Payne 2009) or "pleasantness - eventfulness - familiarity" (Axelsson 2010). With all respect to these contributions, they may put sound into some context, but from an Architect's point of view, they fail to specify the soundscape in more detail, and differentiations such as "rural versus urban" or "hard versus soft landscape" cannot pay sufficient justice to a unique location with its specific quality and to the geographical and topographical diversity, in general.
Brown and Muhar apparently make a virtue out of this dilemma: they accept diversity, more or less, as a starting point of their "Approach to Acoustic Design of Outdoor Space" (Brown / Muhar 2004). Their investigation process starts at the site itself: akin to the architectural design process, they suggest to establish activities for a particular place and context (as it is common in architectural and urban planning,

by zoning strategies and plans). As a second step, they suggest to establish an acoustic environment that is considered appropriate for the place, i.e. to model and to manipulate unwanted sound and wanted sound against each other. Brown and Muhar describe these modeling activities with expressions prone to any designer: eliminating, controlling, maintaining, enhancing, generating, intensifying sound. For a soundscape designer this basically means learning sound masking techniques; for an architect or an urban designer this means, at least, understanding and appreciating these techniques, in order to sharpen the acoustic "sense of place" and to inform the spatial concept and the choice of materials accordingly. As sound masking is closely related to sound locating, this activity can be seen as a genuinely spatial i.e. architectural exercise.

Brown comments on the importance of masking techniques in the soundscape approach as follows: "Nearly all acoustic environments in outdoor places of interest will consist of sounds from many sources. [...] Preference [...] is likely to depend on whether wanted sounds are heard and unwanted sounds not heard. Soundscapes need to be disaggregated by component sources. In acoustical terms, the phenomenon is masking— wanted sounds not masked by unwanted sounds, or wanted sounds masking unwanted sounds. It is suggested that the concept of masking may prove an important key to soundscape study, analysis, and design, but it has been somewhat neglected to date (Brown 2011)."
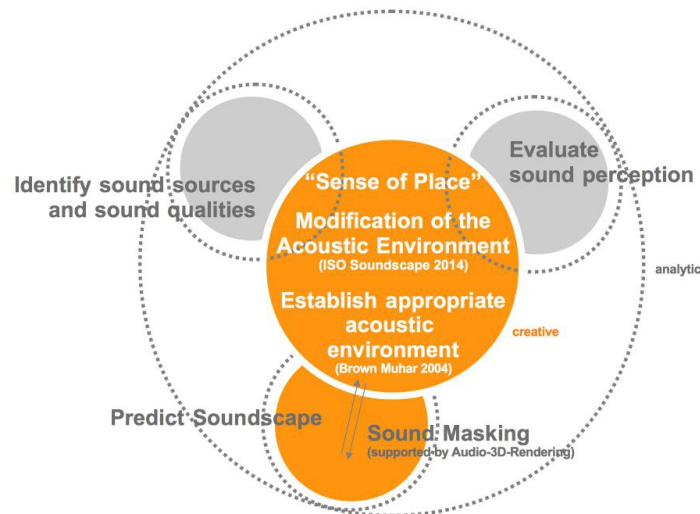

Image 3:
The soundscape approach as a design process with the "sense of place" in the very focus

Image 3 interprets the soundscape approach as a design process with the "sense of place" being in the very focus. The model acknowledges Brown's and Muhar's approach to acoustic design of outdoor space. Eventually, the soundscape design process, as common ground for Acousticians, Architects, Urban Designers and others, constitutes the "Audiovisual Design Workshop".

THE "AUDIOVISUAL DESIGN WORKSHOP" IN DIALOGUE WITH THE CONCEPTUAL FRAMEWORK OF THE NEW SOUNDSCAPE ISO-STANDARD

For good reasons, architects usually need to comply with a tremendous number of "Standards", in order to make their ideas and concepts "safe, reliable and of good quality". Also for good reasons, architects have a strong intuition to bend rules and to question conventions, in order to set new standards, in a rather lateral use of the word. Not surprisingly, there is little enthusiasm among architects and designers to embrace another additional ISO-Standard. However, this paper acknowledges that the conceptual framework, as outlined in the "Soundscape"-Standard, corresponds well with design issues. Three of them lend themselves to the design process in particular:

First of all, according to the ISO-Standard, the "Modification of the Acoustic Environment" deals mainly

with the phenomena of sound absorption, diffraction, reverberation and reflection. This actually confirms current good practice as featured in urban design guidelines that are often available online. These documents, although not aimed at the Soundscape approach, may include practical advice that is very useful for Soundscape design).

Secondly, "Auditory Sensation" is complementary to the "sense of place", as outlined above. The ISO-Standard quotes "Masking" as one main influencing factor of the auditory sensation. This underlines the argument made earlier that sound masking techniques seem to become a key component for the design of soundscapes. "Spectral contents" are maybe best described as (dominating) sound character(s) at a specific location and, as such, will not warrant much more explanation to a designer. There are two other influencing factors with regard to auditory sensation that are of special interest to the designer: "temporal patterns and spatial distribution of sound sources". Architecturally speaking, this means that the experience of a soundscape is not a static one and that it is not bound to one position. Much more so, it is a transitional experience between different soundscapes and different locations, due to the fact that humans usually move around.

This links back to the third design issue: "the context [...] in place and time". Most architects will agree that good design is not only about useful and enjoyable spaces themselves but about the quality of the journey from one space to the other, i.e. the public realm. The "Audiovisual Design Workshop" can contribute to this additional dimension: if architecture and urban design include the space in-between, then soundscape design should include the sound in-between.

CONCLUSION

This paper acknowledges the new ISO-Standard on Soundscape as a "common ground" for acoustics, psychoacoustics, urban / landscape design and architecture (among others), in the course of the audiovisual interpretation of the environment. It suggests that analytical and creative competencies can act complementarily, and it identifies sound masking techniques as a major key component of soundscape design that needs further exploration. More focus on the soundscape approach as a design task may help distinguish the soundscape approach more clearly from others such as noise abatement procedures.

Finally, it is argued that no soundscape, once identified, can be fully explored by catalogues of descriptors, and without making reference to its neighboring soundscapes. The passenger experience in the aforementioned London Underground or the Parisian Metro is nothing less than a journey through different spaces and soundscapes. Maybe it is particularly the way spaces and soundscapes can connect to each other that creates the diversity within the public realm and evokes human response.

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