Potential and pitfalls of using service design to facilitate soundscape thinking in city making

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Abstract

Soundscape thinking - i.e., the capability to consider the experiential possibilities offered by a sound environment - has been characterized as critical for all those design activities connected to city making. Yet, traditional design disciplines operating within the urban domain (architecture, urban planning, service design, etc.) do not routinely engage with processes that systematically identify, control, and change soundscapes. This paper explores how customized service design methods - user journey, service blueprint, and a facilitation toolkit - have been envisioned and piloted within the context of a service design project anchored to the main football stadium of Copenhagen. These methods allowed the service designers and stakeholders involved in the participatory design project to understand existing soundscapes and tweak them by adapting specific touchpoints.

Keywords: Service Design, Soundscapes, Soundscape Thinking, City Making

1. Aims

In the past decades, research has highlighted the importance of considering the impact of soundscapes on city life (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Radicchi et al., 2020; Schafer, 1994). Soundscapes - i.e., a person's perception of the sound environment of a place (Kang & Schulte-Fortkamp, 2016) - affect how people inhabit and experience their cities and have a strong effect on their well-being and health conditions (Louwers, G. et al., 2022; Sørensen et al., 2011, 2013). This area is so relevant that Cerwén coined the term 'soundscape thinking' to refer to "situations where the experiential possibilities in the sound environment are considered" (Cerwén, 2017, p. 15).

Despite this growing centrality, some design disciplines - including service design, architecture, and urban design - have not directed enough attention to soundscapes (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Kustrak Korper et al., 2020; Schafer, 1994).

This paper examines whether service design - particularly, expanded versions of some methods like user journeys, blueprints, and a facilitation toolkit - can play a role in supporting soundscape thinking. To do that, the paper reflects on a 12-month service design project about the main football stadium in Copenhagen carried out in collaboration with an international urban design and research consultancy. As such, the specific focus of the paper can be framed as to whether and how service design can help city makers and other city stakeholders involved in design processes to understand and apply soundscape thinking for the places they are working on and inhabiting.

2. Related work

Cities are where soundscapes have changed the most through human history, in most cases for the worst (Schafer, 1994). In recent years, the importance of sound and soundscapes for people living in cities is becoming more evident and relevant (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Koldkjær Højlund et al., 2021; Mattern, 2020; Radicchi et al., 2020). Today, noise management and measuring noise SPL (Sound Pressure Level) are the main approaches typically employed by city makers and administrators. However, these approaches treat sound as a waste product or ‘noise’ (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Schafer, 1994). As such, we normally associate the impact of soundscapes on people’s lives with the negative effect of certain sounds in certain contexts, which most people will interpret as noise (Cerwén, 2017). An example is the impact that the sound of motorized traffic has on people, as shown by numerous studies demonstrating how long-term exposure to noise increases the risk of cardiovascular and other health-related disorders (Sørensen et al., 2011; 2013).

However, soundscapes impact people’s lives in a variety of ways; it is important to move beyond measuring noise levels and to focus instead on understanding the qualitative nuances of sound and soundscapes, which might also be connected to positive experiences (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Koldkjær Højlund et al., 2021; Louwers, G. et al., 2022; Radicchi et al., 2020; Schafer, 1994).

As such, soundscape thinking can be used to “emphasize the overall experience of sound, where problems and possibilities are accounted for” and to “discuss and

understand the role of sound in planning and design situations" (Cerwén, 2017, p. 58).

A few design researchers emphasized the relevance of considering sound while designing services (e.g. Houben et al. (2022); Louwers et al. (2022); Spagnol et al. (2022); Udsen and Halskov (2022)). However, the literature is still in an emergent phase. Sanz-Segura et al. focus on how service design can contribute to sound design as a new approach to developing audible alarms for products in the healthcare environment (Sanz-Segura et al., 2019). This paper concludes by stating that "the aim of service design is to provide specific insights, design specifications and recommendations for product sound designers and engineers" (Sanz-Segura et al., 2019). Kustrak Koper et al. argue that the service design practice has been primarily visual-centric and propose "sound as an alternative representation medium to augment design tools and methods" (Kustrak Korper et al., 2020). Li et al. suggest a conceptual framework for the assessment and analysis of the soundscape quality of urban public open spaces (Li et al., 2021).

Our paper intends to integrate this existing literature by proposing a granular and practice-oriented view on how service design methods are pliable enough to be tweaked and used to support soundscape thinking. As such, our research question is: *How might service design help city makers and other city stakeholders understand and apply soundscape thinking for the places they are working on and inhabiting?*

3. Research methods

Our study had a duration of 12 months and was built on several methods to generate data: participant observation (Fetterman, 2009), expert interviews (Bryman, 2003), and co-creation workshops (Sanders & Stappers, 2013). Particularly, we focused on a specific case, i.e., the service that the main stadium of Copenhagen, Parken, offers to the attendees of a football match. The authors led a design team that modelled the service through an array of tweaked service design methods (namely, journeys and blueprints). Since these methods were to be used in a participatory design setting involving an array of different city stakeholders, it was also necessary to establish a shared vocabulary on how to understand soundscapes and operate on them. A facilitation toolkit composed of a set of 'soundscape cards' and some related posters has been developed (Figure 1).

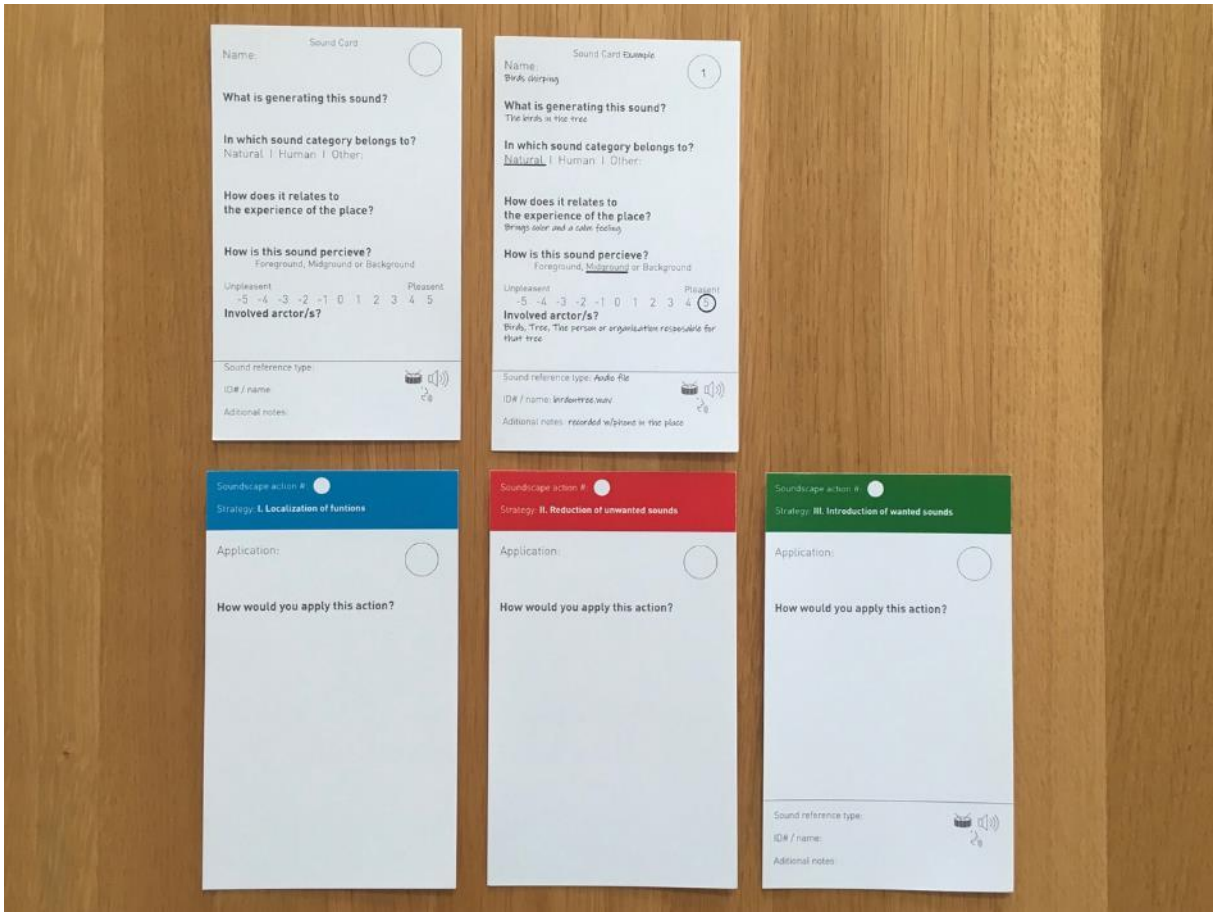

Figure 1. Soundscape cards - for mapping sounds, their perceptions, and involved actors and to sketch soundscapes strategies and actions

All these methods, used in a participatory workshop setting, allowed participants to map and sketch soundscapes associated with specific service touchpoints. The resulting sketch outlines the potential soundscape strategies and actions one could take to re-design the desired soundscape for that service touchpoint. The soundscape strategies and actions used in the facilitation toolkit (‘soundscape cards’ and some posters - see Figures 2 and 3) have been borrowed from the work of Cerwén (2017).

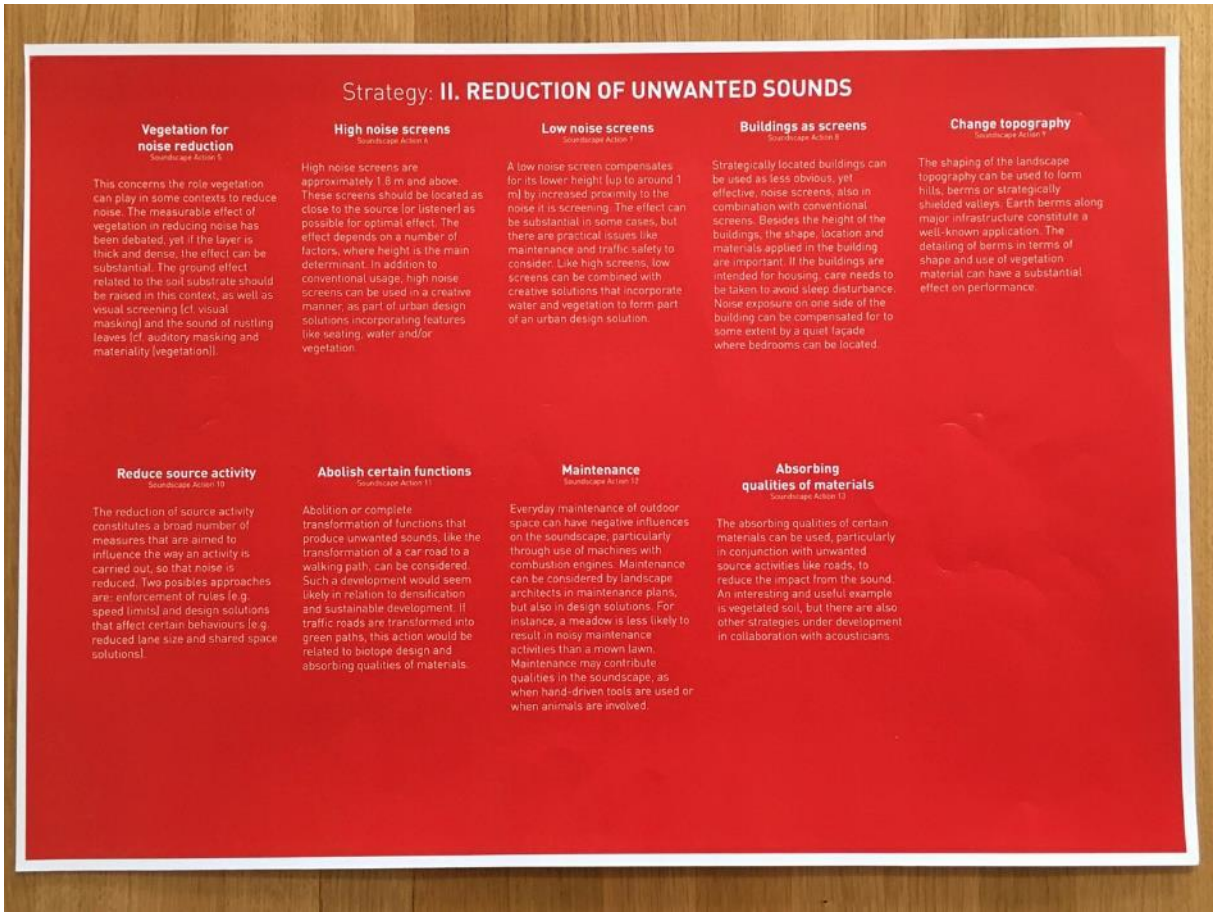

Figure 2. Actions for the reduction of unwanted sounds strategy as highlighted in a poster used during the workshops

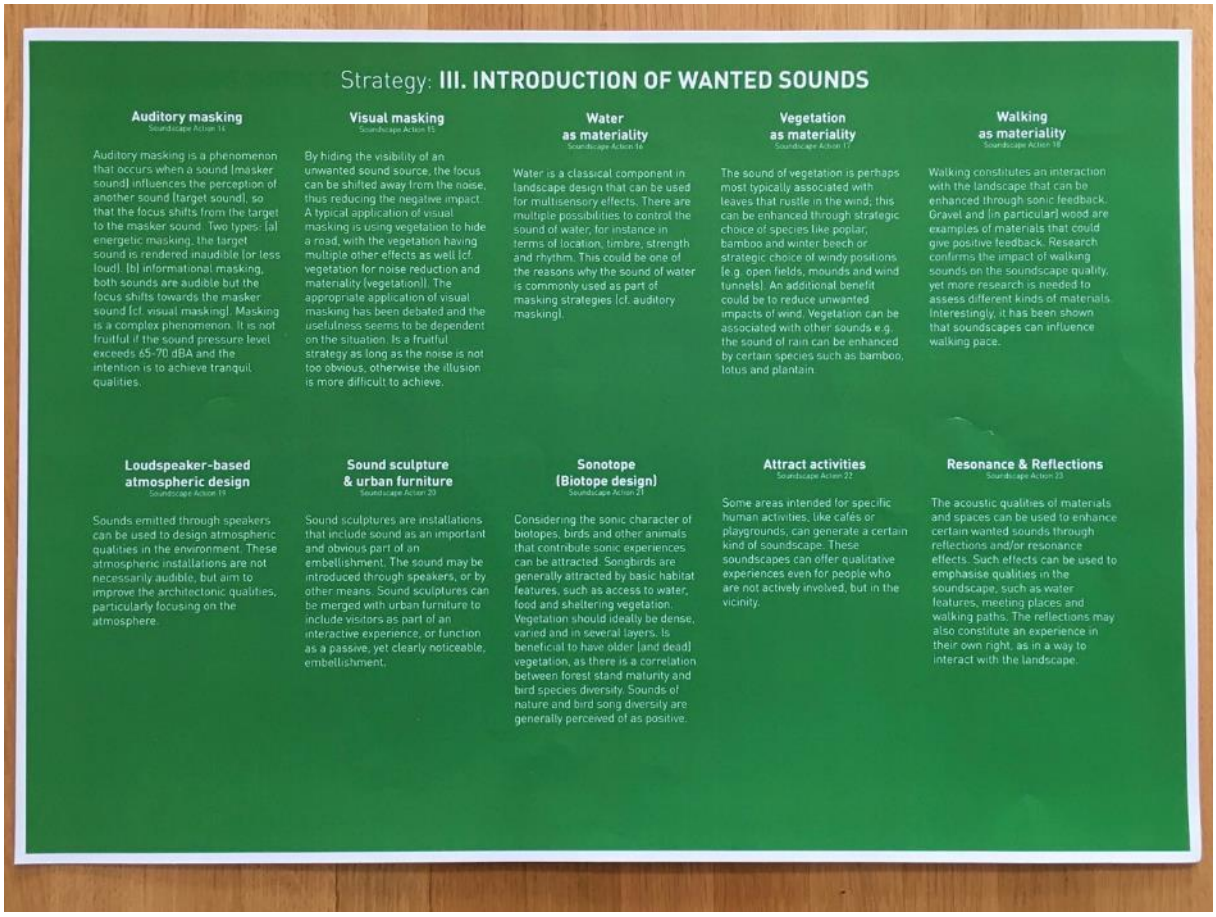

Figure 3. Actions for the introduction of wanted sounds strategy as highlighted in a poster used during the workshops

While deploying these service design methods, the authors ran expert interviews (n = 10, mostly with service designers, architects, urban planners, and urban soundscapes specialists with mid-senior level, 5 or more years of experience, and senior level, more than 10 years of experience) and carried out two co-creation workshops with city makers from the international urban design and research consultancy (5 participants: two Directors – R&D and Urban Planning –, an Industrial Service System Design Ph.D. Student, an Interaction Designer and a Technical Designer) and with some users of the service (3 participants: 3 Football Fans). The workshops were used as an additional method to gather data by observing the participants' behaviour and eliciting their reflections through dedicated discussion sessions. To reduce the bias of a single observation, multiple data collection and generation methods were employed to rely on the synergistic benefits of triangulation (Eisenhardt, 2002).

4. Key findings

The project's scope was to model a service that would welcome the football fans arriving at the stadium before a match. As it is now, football fans go through a series of touchpoints and cross several physical locations. However, a traditional representation of their journey (e.g., Figure 4) would not consider the sound experience of these football fans.

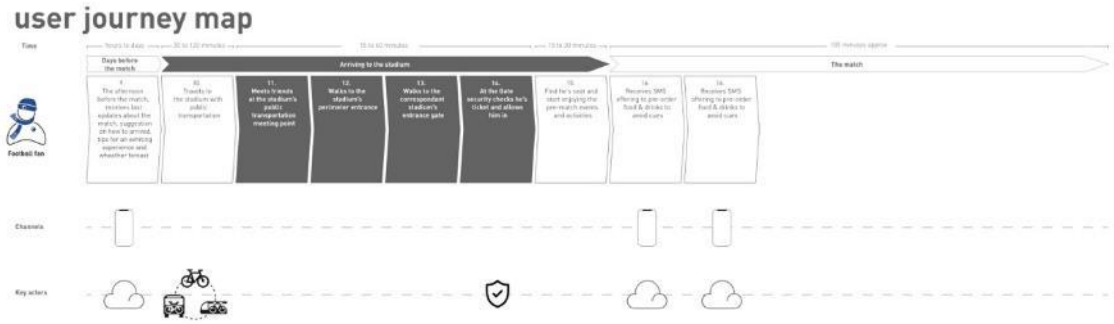

Figure 4. A partial representation of the user journey of a football fan arriving at the stadium, also showing touchpoints

Yet, the soundscapes associated with these service touchpoints will impact the users' experience, hence the value the service offers to them. For example, imagine the sound experience provided by La Bombonera stadium in Buenos Aires, on the occasion of football matches of the Boca Juniors team: the stadium is enlivened by a festive carnival soundscape with thousands of fans chanting football songs accompanied by trumpets and drums while merchandise and food vendors cry out loud in the streets; this is something that football fans can hear even when they are still hundreds of meters away from the stadium; this soundtrack accompanies their experience and the services offered by the stadium. Conversely, the main stadium in Copenhagen exposes football fans to a completely different sound experience: a chill urban soundscape from the metro station almost all the way to the stadium gate; some cars and bicycles are passing by, and people's steps in the cement can be clearly heard while some (not particularly loud) chatting is going on; only later on, right in front of the access gates, some interactions with food vendors and loudspeakers with some DJ music make the soundscapes a bit more cheerful and festive.

The qualities of such sound experiences are generally not modelled through typical service design methods. To consider these soundscapes, we tweaked - through generative design sessions and co-design workshops with architects, urban

planners, service designers, interaction designers, data specialists, sound designers, and football fans - traditional service design methods and integrated them with additional components. As a starting point, we tweaked the journey map by adding new lanes to identify soundscapes associated with service touchpoints, their time frame, references, key sounds and actors, key soundscapes' actions, and a plan (see Figure 5).

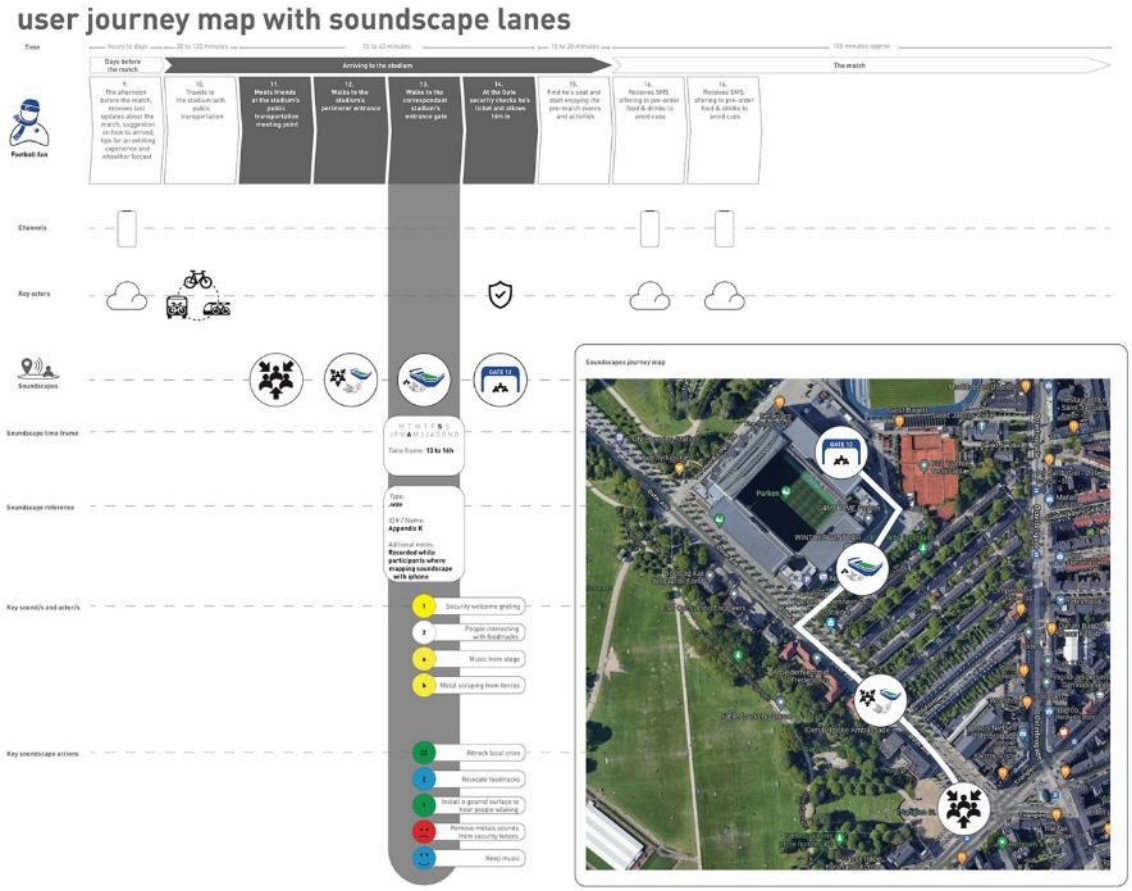

Figure 5. Tweaked journey map with soundscapes lanes

We also tweaked the service blueprint to contemplate the service sounds evidence and the soundscape actions necessary to occur in the front and backstage (Figure 6).

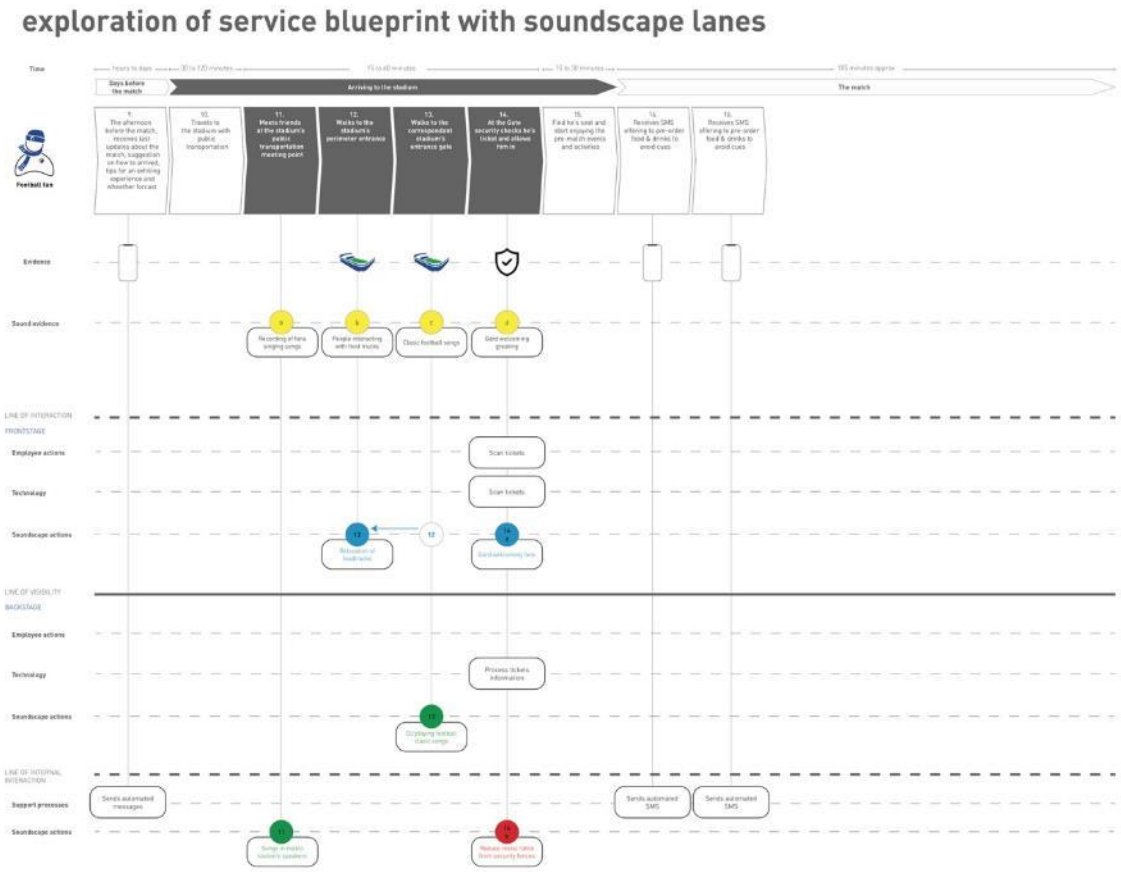

Figure 6. Tweaked service blueprint with soundscapes lanes

These methods have been tweaked and tested during two workshops with city makers from the international urban design and research consultancy and with some users of the service. Empirical material collected through direct participatory observation (Bjørner, 2015) and interviews showed that the ‘journey map for soundscape thinking’ indeed allowed participants to consider the experiential possibilities in the sound environment of a place while keeping a people-centered perspective and contemplating the user journey. The ‘soundscape cards’ were useful to establish a shared soundscape vocabulary and to make participants aware of the possibilities they had to intervene on the specific characteristics of sounds associated with each touchpoint (e.g., reduction of unwanted sounds, introduction of wanted sounds, or localization of functions).

In workshop 2, recording the soundscape references with a phone proved to be a good practice. Reproducing these recordings as soundscape references while reviewing the touchpoints provided perspective and more context to the workshop's outcomes. These recordings, even though having poor technical quality, additionally

informed conversations about the outcomes of the workshop, providing nuanced insights about the soundscape and its context in relation to its built environment. Service design can help city makers identify and understand soundscape thinking opportunities for the places they are working on from the perspective of the people using those places. For example, during workshop 1, city makers were discussing the possibility of applying soundscape strategies and actions as a way to activate the soundscape of the neighbourhood next to the football stadium. During workshop 2, participants suggested how simply relocating and minimally adapting various sound events associated with some touchpoints (e.g., relocating the food trucks and bar kiosks to a previous touchpoint; replacing the DJ music with culturally-relevant football songs) would greatly benefit the entire service experience.

5. Discussion

By reflecting on our design process and workshops, we can distil three broad sets of considerations.

5.1 The value of listening to and contemplating soundscapes

City makers lack simple tools and methods to engage with soundscapes during the design process; in addition, sound work is not routinely included within the design process (Cerwén, 2017; Kustrak Korper et al., 2020). During our workshops, participants learned and applied the basic concepts of soundscape thinking to the case at hand and rapidly recognized the value of listening to and contemplating sounds. The sequencing of methods proposed in the workshops provided a timeframe to integrate soundscape thinking with a people-centered approach to reach a more nuanced and user-centered understanding of individual sound experiences. While our workshops showed the value of this integrated approach, the challenge is that working with sounds required additional time and commitment and extended the duration of the whole design process. As such, the international urban design and research consultancy we collaborated with voiced concern about the economic viability of this approach.

5.2 The importance of a shared soundscape vocabulary

The service design methods adapted for soundscape thinking have shown to be successful in first, painting a granular view of the context of a soundscape, and second, establishing a shared soundscape thinking vocabulary for city makers and users to have a reflecting conversation with the case at hand. Even though this approach was effective in our two workshops, these methods would need to be

developed further. For example, these methods could sharpen the vocabulary related to soundscape thinking by incorporating psychoacoustic concepts such as loudness, sharpness, roughness, and fluctuation strength (Kang & Schulte-Fortkamp, 2016).

5.3 The role of service designers for soundscape thinking

Soundscapes are complex, and their studies cover a broad and rapidly growing field (Cerwén, 2017; Kang & Schulte-Fortkamp, 2016; Koldkjær Højlund et al., 2021; Schafer, 1994). There is an urgent need for "multidisciplinary approaches to evaluate the qualitative and perceptual peculiarities of the urban sonic environment that can successfully guide possible interventions within the complex, stochastic processes that create an acoustic environment" (Radicchi et al., 2020). Service designers can become 'urban soundscapers' (or part of an 'urban soundscapers' team) with the task of seeking actual improvements in the soundscapes to better the lives of people living in cities (Radicchi et al., 2020). Or, even more specifically, service designers could specialize as 'service soundscapers', i.e., an approach focused on researching, designing, managing, and adjusting the soundscapes associated with the service touchpoints. The big challenge soundscape thinking faces, though, is that most people refer to noise management when thinking about soundscapes. Noise is simply an unwanted sound in a specific context, and noise management treats sound as a waste product of the environment. That is why the introduced adapted service design methods originated from the research of this paper suggest a shared soundscape vocabulary that also focuses on generating wanted sounds in the city environment.

6. Conclusions

This paper has briefly explored how service design methods can assist city makers and other city stakeholders in understanding and applying soundscape thinking for the places they are working on or inhabiting. However, the proposed adapted methods must be tested and further developed across different contexts and with diverse actors and project types, which may impact neighbourhoods or cities. Digital technologies and platforms may either support or hinder the new service encounters and local ecosystems created with these methods. As such, this paper can only be considered a tentative exploration of an area of work that will, hopefully, greatly expand in the future.

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