
The Role of Situated Public Displays on the Experience of Place

Niels Wouters

Research[x]Design
Department of Architecture
KU Leuven, Belgium
niels.wouters@asro.kuleuven.be

Sandy Claes

Research[x]Design
Department of Architecture
KU Leuven, Belgium
sandy.claes@asro.kuleuven.be

Andrew Vande Moere

Research[x]Design
Department of Architecture
KU Leuven, Belgium
andrew.vandemoere@asro.kuleuven.be

Abstract

The number of digital media in urban space, along with their interactive functionalities, is constantly expanding. While deployment is often motivated by commercial objectives, the impact on their urban surroundings is often neglected. In this position paper, we build upon an analysis of two recent case studies to propose four design considerations for situated public displays in urban space, i.e. providing mechanisms that (1) allow citizens to reflect on the meaning and functionality, (2) build a sense of trust, (3) warrant hyperlocal relevance of the message that is communicated and (4) aim to elicit enriched urban experiences. This paper highlights the role of situated public displays in becoming a contextual platform for information that is able to augment social cohesion among neighborhood residents and positively influence the experience of urban space.

Author Keywords

Urban informatics, situated display, community, public display, participation, data visualization, urban data.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors.

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Street Infographics signs visualized local demographic data such as the number of immigrants and students by way of icons.



Figure 1. Street Infographics, consisting of a series of visual representations of local data, attached underneath an existing street sign.

Introduction

The increased ubiquity of information technology and computing infrastructure in our urban environments is influencing our experiences in public space. Common examples include public displays in strategic locations for the purpose of sharing information, raising awareness, providing a platform for culture, and encouraging commerce (e.g. [3, 7, 9]), or sensor-equipped urban infrastructure to analyze and optimize city life (e.g. [5, 8]). Such deployments often focus on making cities 'less complicated' and more 'efficient' within the context of the Smart City [1]. However, there is also a recent understanding that additional insights are required in uncovering how the digital world can more explicitly merge with our physical and social existence, and vice versa [4, 6]. As such, the integration of technology in our urban environment may benefit from connecting with local challenges and issues, and become meaningful and situated.

In this paper, we build upon an analysis of two case studies to propose four considerations that proved successful in contributing to the shared experience of urban space. Our analysis goes beyond any technical issues, but rather focuses on contextual aspects, i.e. the social, societal and cultural qualities of the urban environment.

Situated Public Displays

As one of the endeavors in bridging physical and social existence, we have deployed two sets of situated public displays. Both aimed at communicating contextually relevant messages, yet differed in their design approach, situatedness and supported interactions.

Street Infographics. In this study, published in [2], contextual data was visually represented in four adjacent streets. In each street, two socio-demographic data dimensions for that particular street (i.e. student population and immigrant population) were visualized through the use of icons (see Figure 1). The number and color of icons represented information such as the proportional share of students and foreign nationals. The graphic design of the visualization mimicked the characteristics of a street sign in terms of color scheme, typography and physical dimensions. By attaching the visualizations to existing street signs, they implied to represent information of that particular street. As passers-by walked along the four streets, they were given opportunities to compare the various data of the different streets.

StreetTalk. In this study, published in [11], three households have been empowered to participate in the design of public displays, adapted beyond their traditional, rectangular, screen-based format and



Figure 2. *StreetTalk*, consisting of three situated public displays that allowed messages to be printed (*Readl*, left), audio fragments to be listened to (*Listen*, middle), and ambient sound levels to be visualized (*Shush*, right).

informed by personal design insights shared by the households themselves. The outcomes consisted of 1) *Readl*, a thermal printer that delivered household-generated messages, 2) *Listen*, an integrated audio system allowing neighbors to listen to household-generated audio messages, and 3) *Shush*, a lighting installation that raised awareness on street noise by visualizing ambient sound levels (see Figure 2). These displays were physically developed, attached to the façades of private residences, and their impact on the neighborhood was evaluated during an eight-week in-the-wild field study.

Role of Situated Public Displays

Through observations and interviews with passers-by and community members, we collected qualitative feedback on people's subjective experience with the situated public displays. Insights are discussed in the following, and design considerations are presented.

Personal Interpretation

The public presentation of factual data does not involve expressing an opinion, but may provoke distinct expectations and reactions. We learned from *Street Infographics* that onlookers went beyond stating a data fact or trend, but also expressed a more personal reflection. Some residents revealed that their opinion on the issue being represented had changed in a positive way, while others connected the public appearance of contested data with political propaganda. Similarly, while the *StreetTalk* displays did not explicitly allow for personal reflection, residents revealed they had reconsidered the goals of the displays. For example, some considered *Shush* to be a device that playfully intertwined light and sound, rather than a device that purely aimed to patronize neighbors.

Allow for Reflection. Situated urban displays serve more purposes than merely communicating data and information. Their impact on people can be rich in triggering various experiences, in terms of the design characteristics, the information that is shown, or the expected interactions. Therefore, situated displays should allow people to resist or sustain meaning on their own terms, allowing for multiple interpretations and reflections to emerge.

Confidence in Information

As public displays are meant to address 'everyone', characteristics such as trust and relevance fulfill a major role. In *StreetTalk*, the displays were physically mounted to the façades of private residences, which made the residents feel personally responsible and concerned. It also proved helpful in building a sense of trust and credibility among passers-by and neighbors. They revealed that "It's attached to a house façade [...]"

so I'm sure [its contents] will be no nonsense"; a feeling that was further amplified by design qualities, such as the visible cabling, the rather ludic functionality of the displays, and their handmade look-and-feel. As *Street Infographics* were attached to official street signs, we occasionally observed onlookers to search for indications of authorship, such as by looking at the backside. The factual data made some citizens question aspects such as privacy and content (e.g. "Is it ethically correct to display the number of foreigners?"), while some connected the location of the signs with the credibility of the data (e.g. "The numbers must be official, it is part of the street sign!").

Establish Trust. The contextual character of situated public displays can be exploited as a quality to establish trust and credibility among the citizens, households and organizations they aim to address. To increase 'success' of communication, strategies such as indicating the authenticity of the data source, or considering the physical location in terms of its contextual role or meaning may be considered.

Local Relevance

Public displays become situated in their environment through the message they communicate, their local relevance, and the community that is addressed and reached. As a result, the physical reach of situated displays may be limited, especially when engagement is sought from citizens unfamiliar to the community. We learned that *StreetTalk* was particularly appreciated if messages took inspiration on local occurrences, such as "tonight X, our neighbor from number 78, passed away at 91 years of age [...]". Neighbors considered them "a valuable source of news", allowing them to easily relate to the contents. Participant households deliberately

decided to only publish messages that addressed and were comprehensible to large audiences. This consideration was based on their personal belief that certain topics can only be communicated through channels that facilitate open debate. However, we discovered that neighbors from distant streets refrained from interacting with the displays as they were attached to houses inhabited by "unfamiliar people".

Warrant Hyperlocality. Situated urban displays should accommodate the various expectations, beliefs, values and norms that characterize urban environments and their inhabitants. As a result, the creation of meaningful content can be considered more challenging than traditional content creation processes, especially in terms of respecting the various backgrounds and interests within the involuntary 'urban' social network.

Calm Technology

Through their latent presence, situated displays are capable of creating a pleasant environment, allowing onlookers to engage both the periphery and the center of attention [10]. Although *Street Infographics* did not obstruct everyday activities, some onlookers mentioned they noticed 'something' was different than usual. They also proved successful in motivating onlookers to explore adjacent streets, in an effort to discover additional street signs and to compare the different datasets of multiple streets. In *StreetTalk*, households mentioned the displays to motivate a slower pace, as people were surprised by the unusual devices, and were expected to press a button, wait for a printed or audible message, or make noise in front of the house: "The displays seemed part of a puppet theater that we directed and performed. Such slower pace is what constitutes a typical residential neighborhood".

Elicit Enriched Experiences. Situated public displays have the potential to enrich the urban experience, by leaving expectations ambiguous, integrating elements of surprise, and allowing for diverse motivations of interaction, ranging from entertainment to more personal or strategic reasoning. At the same time, long-lasting engagement from 'everyone' should be considered, both in terms of interacting with public displays as in stimulating social interaction between citizens and the surrounding public environment.

Conclusion

Situated public displays should be considered beyond the traditional interpretation of urban technology as a series of tools that make cities 'less complicated' and 'more efficient'. Rather, they should be considered as a promising opportunity that is capable of generating new perspectives on the urban environment, by building a relationship of trust with citizens, allowing individual interpretations to emerge, and presenting locally relevant information. We investigated the inherent challenges and qualities by visualizing otherwise contested data (*Street Infographics*) and by inviting individual citizens to participate in the design of public displays (*StreetTalk*).

Based on our studies, we have presented four design considerations that should be investigated when deploying situated public displays. Our analysis focuses on the experience of public displays within the local environment rather than the functionalities, aesthetics or technologies they embody. We argue that, by considering these considerations, situated public displays have the potential to positively contribute to the experience of urban space, and contribute to the emergence of 'place'.

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