Soapbox: A Situated Platform for Civic Engagement

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ABSTRACT
This paper presents an interactive Soapbox platform, which utilizes networked public displays to encourage local citizens to participate in civic engagement. Soapbox is comprised of three subsystems: Soapbox for speaker (SFS), Soapbox for audience (SFA) and Shoutbox. SFS allows people to deliver a speech to the public. SFA enables audience members to watch a speech and give feedback to it. Shoutbox is an input tool that runs on personal devices and is used to author comments and share them with the speaker and other members of the audience. The Soapbox system was evaluated in both the lab and the field. The evaluation demonstrated that users are positive about trying the platform, and can quickly grasp how to use it. Further, participants thought that Soapbox is very appropriate for its purpose, and can effectively attract more citizens to participate in civic engagement.

Author Keywords
Urban computing; ubiquitous computing; public displays; civic engagement; in-the-wild research.

ACM Classification Keywords
H.5.2. Information Interfaces and Presentation: User Interfaces — Input Devices and Strategies

INTRODUCTION
New types of urban computing technologies, such as public displays, are increasingly being deployed in public areas to provide computing platforms and novel services for communities [14]. Previous literature shows that artists and researchers around the world have started to envision and implement new situated urban media architecture, applying urban technologies to interactive systems that provide public platforms to support new forms of technology-mediated civic engagement [2]. In this paper, a creative solution to civic engagement in public space is presented.

We discuss the potential for such a civic engagement platform though a prototype we call "Soapbox", named after the famous practice of standing on a soapbox to deliver a public speech, originating in Hyde Park, London [15]. Famous individuals such as Karl Marx and George Orwell were known to utilize the soapbox in Hyde Park to address spectators. With the digital version of a Soapbox, people can deliver a speech from one location, and the speech will be made available to the public through linked public displays. The physical Soapbox device is modelled as platform consisting of a pressure-sensitive box that people stand on to give a speech, and an integrated public display showing the dislocated audience through video feeds from the linked public displays. Further, the speech delivered on the Soapbox can be streamed to a virtual 3D counterpart of the city, where people, through their avatars, can view the speech. Finally, people in the virtual city can also utilize their avatars to deliver a speech using the virtual counterpart of the Soapbox. This speech will again be shown in the virtual world, and also streamed to the linked public displays in the physical world. In this paper we will focus on the physical Soapbox, as the functionalities related to the virtual world are still a work in progress.

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RELATED WORK
Public displays have been utilized for connecting remote locations from the 1980s onwards. Perhaps the earliest prototype, called Hole-in-Space [4], enabled a live video and audio connection between Los Angeles and New York City. Another example is the prototype called "Telemurals" [11], which made it possible for two remote spaces to connect with each other through an interactive wall. Public displays situated in urban space have also been used as a platform to encourage civic engagement, increase social participation and raise awareness of local issues [3]. Text has been regarded as one of the most prominent content types on public displays [5, 6, 13, 17] and the feature has been utilized for opinion gathering and sharing in public space [7, 9, 12, 16]. For example, the Smart Citizen Sentiment Dashboard [1] enabled citizens to express their mood in their daily life. Another example is the InstaBooth [10], a portable installation that allowed communities to share their thoughts and ideas in an unstructured and playful way. In addition, Ubinion [8] was an interactive system running on a network of public displays that enabled young people to create content and leave feedback about civic issues around the City of Oulu in Finland.

DESIGN & STUDY
The Soapbox architecture comprises of components both in physical and virtual world in order to offer support for communication, synchronization and distributed data storage. Figure 1 illustrates the relationship between functional components as a sequence. The process begins

with human detection (1), *i.e.* detecting when a user stands on the Soapbox. For user detection, we used a pressure sensitive smartboard (Wii Balance Board). Then, the Soapbox system is activated (2). While interacting with the Soapbox, a user can submit information about the speech s/he is about to deliver, including his/her name and the topic of the speech (3). At the same time, the video stream of the speaker will be synchronized (4) and shown on all linked audience displays and in the virtual 3D world (upcoming). On the linked audience displays, people listening to the speech can scan a QR code which will direct them to a mobile web application called "Shoutbox", which enables the audience to send feedback (5) to the speaker through the middleware. In addition, the virtual Soapbox (6) can also communicate with the physical world via the middleware.

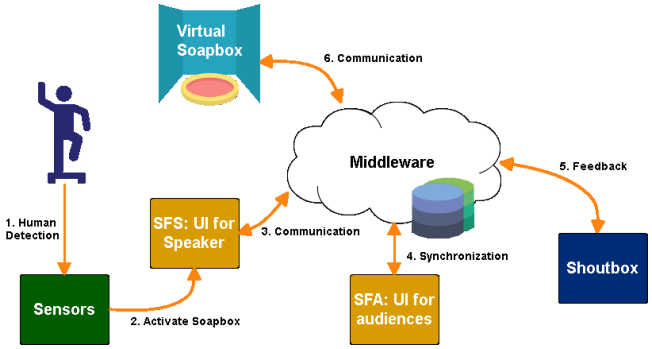

Figure 1. Soapbox architecture.

The physical Soapbox platform was evaluated in two studies; (1) in the lab and (2) in the wild. In order to test the usability of Soapbox, we set up the Soapbox and an audience display in a laboratory setting and recruited 12 participants to carry out pre-defined tasks. After the lab study, found usability issues were addressed and another study was conducted at a University campus. Here, the Soapbox was deployed in a central location for 7 days. We also deployed 3 audience displays (46" full HD LCD panels) in populated areas around the campus. For data collection, we logged all interactions with the system. Further, we conducted observations (28 hours) and semi-structured interviews (n=21) when users finished interacting with the displays and had moved away from them. After the interview participants were asked to fill in a short questionnaire.

RESULTS AND FINDINGS

During the seven-day deployment on campus, 23 speakers delivered speeches with Soapbox and 39 members of the audience joined Shoutbox via scanning the QR code on the three audience displays. In total, the 23 speeches lasted for 79 minutes (average time: 3min 24s per speech). Table 1 summarizes the audience feedback from three audience displays and the Shoutbox. From the table, we can see that the 23 speeches obtained 284 thumbs-up (87% on audience displays and 13% from Shoutbox), eighteen thumbs-down (38.9% on audience displays and 61.1% from Shoutbox) and two reports of inappropriateness (all from audience displays).

Interactions	Total	D1	D2	D3	Shout box	Avg/ display
Thumbs-up	284	47	169	31	37	71.0
Thumbs-down	18	2	4	1	11	4.5
Report	2	1	1	0	-	0.7

Table 1. Usage statistics per interaction and per display.

Interviews and questionnaires

We conducted 21 (seven speakers, fourteen audience members) semi-structured interviews. All speakers stated that the system encouraged them to deliver a speech in public, with five respondents saying that it was because they could see all the feedback from the audience in real time and they could answer the questions immediately, and two respondents saying that it was because of the innovation of the new technologies. Most speakers reported that they would use the system to give a speech in the city center if they had good topics, such as culture, education, politics and entertainment. Audience members stated that the system encouraged them to listen to and participate in the public speech for several reasons: 1) it is convenient to get access to the Shoutbox; 2) the discussion between the members of the audience and the speaker encourages a two-way interaction; 3) posted comments are anonymous.

Results from questionnaires show that the Soapbox platform is perceived as a simple, practical, straightforward, worthwhile, stylish, attractive, inviting and motivating system for civic engagement. With regard to perceived usability, the participants thought that the system was easy to use and the functions were sufficient for civic engagement. Further, the respondents agreed that the system could incite their curiosity and they would like to recommend it to their friends and family. Lastly, most respondents thought that using Soapbox was fun and they felt involved during the speeches.

CONCLUSION

We presented a study that designed and evaluated an interactive Soapbox platform for civic engagement. Unlike previous work focusing on the traditional media platforms, our work aims at merging the current new technologies with the traditional speech ways, so that more people will be able to deliver a speech and have their voice heard. Our findings suggest that a good topic can encourage people to get involved in the speech and in turn the audience's engagement will motivate speakers. The problem with the field trials is that the testing space and users were limited because the study was conducted at the campus.

In the future, we plan to merge the virtual Soapbox with the physical Soapbox, then the whole dual reality system can be evaluated. Further, we will deploy the system in a more realistic place, such as the city center, to study how different kinds of people interact with the system and how it performs over a longer period.

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