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Local Commons: A Visual Approach to Collective City Making through Situated Community Engagement

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Abstract. Due to the numerous possibilities of voicing concerns and the flood of data we are exposed to, local issues are sometimes at risk of being overlooked. This study explores Local Commons, a design intervention in public space that combines situated digital and tangible media in order to engage communities in contributing and debating different perspectives on a given local issue. The intervention invited the community to submit images of their perspectives on the issue, which were displayed on a public screen. Via tangible buttons in front of the screen, community members then agree or disagree on the displayed perspectives, creating a space for deliberation. In a user study, we were specifically interested in testing three aspects of our intervention, which are discussed in this paper: The difference that situatedness, visual content, and tangible interaction can make to urban community engagement.

Keywords. Community engagement; public displays; urban screens; civic innovation; situated technology; urban informatics; interaction design; tangible interaction

1 Introduction

The World Health Organization estimates that by 2050 approximately 6.4 billion people will live in cities – around 70% of the world's population (http://goo.gl/RvDB1V). With this growing density, cities will be prone to more and new issues and struggles, ranging from infrastructural challenges, such as

transportation and energy consumption, to social problems, like immigration, gentrification and the changing demands of demographics (Sassen 2004). At the same time, the increasing amount of digital technologies and networks available turns cities into multi-layered spaces (Wessner 2009) full of local community groups and socio-cultural diversity. Over the visible physical layers of buildings and infrastructure, an invisible digital layer emerges, which gives citizens new opportunities "to make their voice heard on a variety of issues" (Foth, Choi, & Satchell 2011).

In our study, we are interested in this hybrid approach that makes use of physical public space as well as situated digital technology, sometimes referred to as location-based services, or locative or urban media (Farman 2011; Gordon & de Souza e Silva 2011).

Colleagues have called, "for an agenda to design the next generation of 'digital soapboxes' that contributes towards a new form of polity helping citizens not only to have a voice but also to appropriate their city in order to take action for change." (Foth, Parra Agudelo, & Palleis 2013). Such 'digital soapboxes' hence should not only approach place and technology in an integrative way but also involve citizens, communities, and their ability to produce and contribute information to a greater extent in order to give them voice. This also calls for public place to incorporate its traditional role again, as the space where discussions and social exchange take place (Habermas 1991). Alongside, citizens have to be appreciated not only as consumers of information but also as producers and contributors. Digital soapboxes hence not only have to support but also foster this conception of an active citizenry or smart citizens (Foth, Parra Agudelo, & Palleis 2013).

In this paper, we explore the benefits place-based digital and tangible media could have on the communication and deliberation of local issues. After reviewing prior works, we present our research approach that informed the design and development of the *Local Commons* prototype – a public display application located at a bus stop linked to two large tangible buttons placed on the ground in front of the display. The interaction with the intervention was twofold. First, it invited the audience to submit images of public places in the local neighbourhood they especially liked or disliked. Second, the community then had the possibility to agree or disagree on images displaying different perspectives on public places by stepping on tangible buttons – as a simple form of deliberation. We discuss our findings before we conclude by outlining our next steps.

2 Prior Works

Community Networks have been developed in order to support local governance during the 1990's as online communities focusing on 'public affairs' within a local area. They have been proven to provide a platform for gathering civic

intelligence, for developing people projects, and for fostering a public dialogue among citizens and between local authorities and citizens (De Cindio & De Marco 2006; De Cindio, De Marco, & Grew 2007). However, they showed to have limitations concerning the actual decision making process. Although connected to the local governments, the actual decision making power remained disconnected from the citizens and within the authorities (De Cindio & De Marco 2006; De Cindio, De Marco, & Grew 2007). To overcome this limitation, De Cindio et al. developed a software environment as part of an Italian agenda for promoting digital citizenship (De Cindio, De Marco, & Grew 2007). Ten municipalities in Italy's Lombardy Region therefore created an e-participation project called *Progetto e21* (http://goo.gl/a2Memz). The aims of this project were to identify critical situations, such as traffic or pollution issues, to ideate suitable solutions for these issues, to evaluate them and finally implement one solution through an e-participation framework that makes use of appropriate ICT applications. The software environment developed by De Cindio et al. rests on these aims. As the described aims foresee a decision making process through deliberation within the community, the created software environment, called openDCN, represents a so-called *Deliberative Community Network* (DCN), which is an evolution of traditional Community Networks (De Cindio & Peraboni 2011).

One of the main challenges faced by DCNs lies in their ability to spill over into the urban fabric. In response to this challenge, Schroeter developed and tested *Discussions in Space* (DiS) as a situated, urban screen-based community engagement tool (Schroeter, Foth, & Satchell 2012). DiS is a public civic feedback, discussion and opinion platform. It provides an in-situ tool for local governments to engage citizens, allowing them to contribute their opinion about official urban planning matters to large public screens. By consulting the public, planners and residents of the city are put on the same level. Especially residents who are generally difficult to engage, such as younger residents and time-poor professionals can be reached. Our study goes one step further in that we explore the use of visual contributions (photos) as part of the deliberative process, as well as the use of situated, tangible buttons in order to provide a simple and register-free polling interface.

3 Research Approach

Our more extensive review of the literature did not find many examples of projects that combine digital and tangible media. They are either completely digital or analogue (tangible). As both approaches showed benefits and backdraws, we want to find out if combining them may be promising. Hence the research questions for this study are:

(1) How can place-based tangible and digital media contribute in communicating local issues?

(2) How can such an intervention be designed based on the findings of the literature review?

In order to answer these questions, we started an ideation process that comprised brainstorming and brainsketching.

3.1 Brainstorming

Brainstorming is a widely used and well established creativity and idea generation technique (Van Der Lugt 2002). The purpose of brainstorming is to generate and accumulate a wide range of ideas, without judging or evaluating them during this process. Thus it allows the participants to free their minds and hence to free their creativity.

Before generating ideas for situated interventions that communicate local issues, we decided to create a list of design principles and characteristics that would broadly outline the design space we wanted the intervention to sit in. This list should be brainstormed and hence reflecting not only the literature and related works but also personal interests and intentions. In turns, we named one characteristic or principle and added it to the list, without any additional explanations. We collected 22 characteristics, which were then explained and discussed. As the purpose of this method was to broaden up the design space, the collected characteristics are rather open than restrictive. Although brainstormed, these characteristics reflect the literature and our research interests and hence hail from different areas. During the discussion of these characteristics, we had to rename six of them in order to make them more expressive, but none of them were discarded from the list as we agreed on their respective contribution to the design space. The 22 final characteristics are as follows: *Tangible; Multimodal; Open; Minimal; Simple; Analogue; Graffiti; Collaborative; Subversive; Ephemeral; No screens; Democratic; Funky; Movable / Mobile; People come together; Challenge stakeholders; Fun to play with; No censorship; Follow-up; Integrate; Effective; Provide for serendipity.*

3.2 Brainsketching

Sketching is the archetypal design activity, the main tool for designers when it comes to generating ideas. A sketch does not only allow to physically represent a mental image of an idea, it actually fosters the generation of such mental images and stimulates creativity (Van Der Lugt 2002). There are numerous ways of creating sketches, using tools that range from pen and paper to Lego bricks. But what they all have in common is their intention: They invite suggestions, criticism and most importantly, changes. Here, we follow Van Der Lugt (2002) who suggests a technique that uses the qualities of sketching for generating ideas. This technique is called *Brainsketching*. Participants first sketch their ideas individually on paper. After a certain amount of time, the sheets of paper are

passed on to the other group members and the individual sketching continues. This procedure is repeated five times. After each round, the participants shortly explain their sketches to the rest of the group. By passing on the sheets of papers, the already present sketches can be used to build on top of them, serving as a stimulus for new ideas (Van Der Lugt 2002). We did five rounds, with each round limited to 120 seconds. In turns we roughly sketched an intervention that implements the chosen characteristics for each round: *Moveable and democratic; Fun to play with, challenge stakeholders, and no censorship; Analogue, collaborative, and graffiti; Provide for serendipity, follow-up, and funky; Subversive and people come together.* We produced ten sketches (one contained two ideas, hence there are eleven ideas in total) (Figure 1).

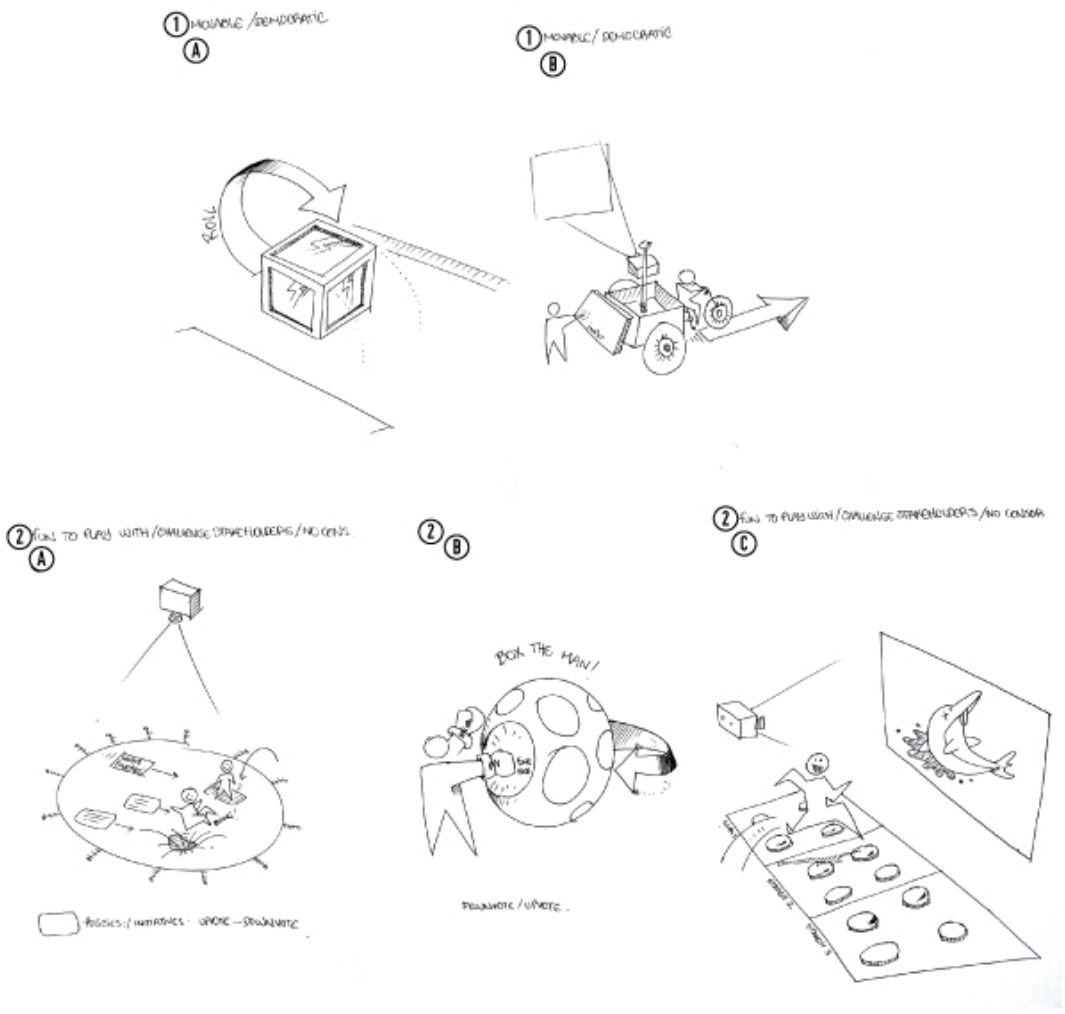

Figure 1: The first five sketches resulting from the Brainsketching session (revised rendering).

4 Prototype Design

Based on our ideation sessions, we developed a high-fidelity prototype (Figure 4). The public display presents two screens. The first displays the images and the questions (Figure 2); the second the button interactions. Whenever a button is pressed, a bar diagram represents the votes for the current image. This is augmented by a key stating e.g., “You and 7 other people agree with that,” or “21 people don’t agree with that!” This screen fades out after a certain amount of time without any additional votings and the first screen is displayed again.

The buttons (Figure 3) are made of wood and foam. They have a size of approximately 27 by 27 cm and a height of about 7 cm. Inside, we re-purposed off-the-shelf door bell buttons, which, connected to an Arduino, allowed us to detect button presses. For the visual input, we used the Instagram API. The interaction with Instagram was handled through the hashtags users can attach to their images. By using the Instagram API, all images tagged with a specific hashtag can be requested. In this case, the intervention queried Instagram for all images tagged with #LocalCommons. These images were then saved in an online database. Due to ethical restrictions, a moderation feature was added. After moderation, the accepted images were collected from the online database and saved in a local database that served them to the application for display.

Figure 2: The main screen displaying an image tagged #good

Figure 3: The AGREE and DISAGREE buttons

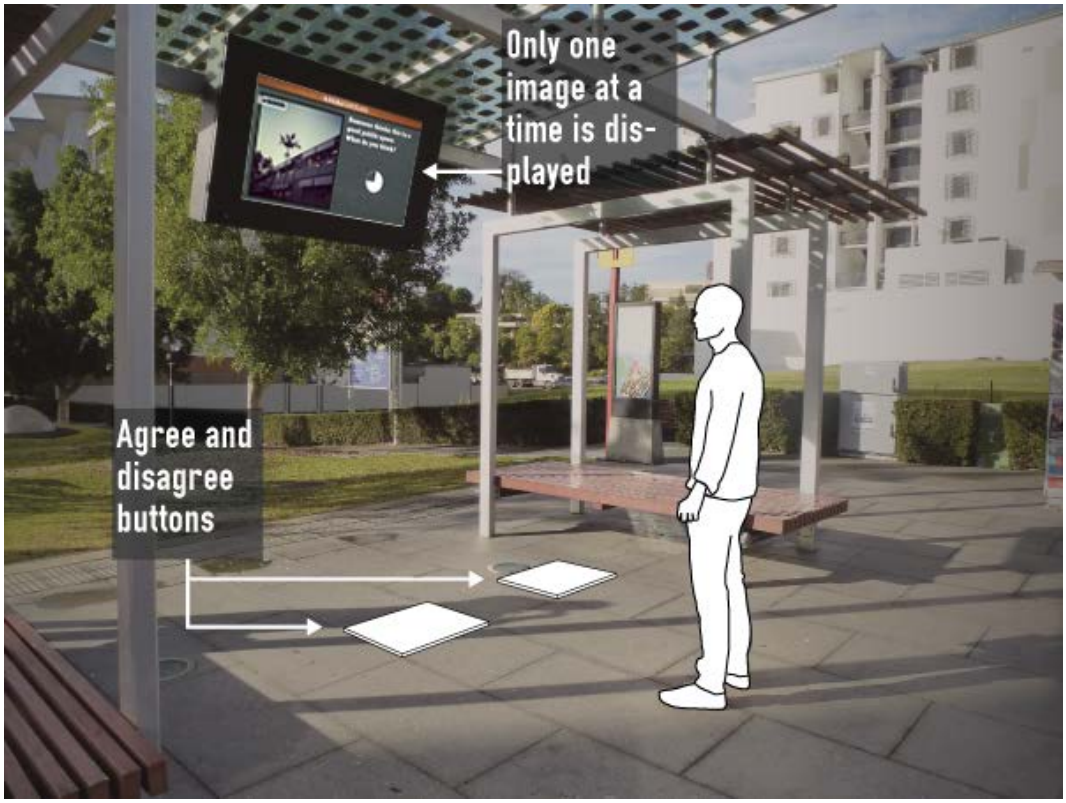

Figure 4: Mockup of the Local Commons concept

5 User Study

The prototype user study was conducted in order to evaluate the underlying concept of the Local Commons intervention. This comprised the idea of comparing different perspectives, the relevance of the chosen local issue and the usability of the intervention. We tested the prototype with 5 participants. Each study participant had to perform a set of tasks and subsequently fill out a questionnaire. The questionnaire comprised six questions with Likert scales as an answer format. Throughout the study, the participants were asked to think aloud. The entire study was recorded on video and later on transcribed. The transcriptions were coded using a Dedoose, an analysis software for qualitative data. An expert field study complemented the user study.

6 Discussion of Findings

Our findings corroborate our assumption that there is merit in combining a situated approach with tangible elements. Especially Participants 4 and 5 were specific on this. They stated that if such an intervention was not physical and situated in public space, they would not use it. An online version of this intervention would probably not work for them. As Participant 4 stated: *"It works for me because it's physically in the place and can fit into my everyday routine. I would be less likely to use an online survey or something."* Participant 5 stated something similar and also Participant 1 made a comment which values the place based approach: *"So I just think that this is the perfect option for me to express my opinion on the place"*. Having the intervention anchored in public space combined with the tangible buttons brings several advantages according to the participants. First, through the occupation of physical public space, it makes it easier to perceive such a local issue. As Participants 5 stated in this context: *"I wouldn't even make it to that page,"* referring to an online version of such an intervention. The tangible buttons, that "spill" out of the digital screen, support this as they are the main elements that occupy the space and create a disturbance in the perception of that space.

Second, the tangible elements make the interaction with the intervention easy and intuitive. Participants 2 and 4 explicitly mentioned this. Participant 4 expressed this in the following: *"I think it is easy to use. Like I walked up and you guys were there and I said hello to you guys and then you didn't tell me anything to do, I just looked at the screen, it took me about maybe a minute to see what's going on, or less than a minute. And then it was intuitively to tap the button. So in terms of the usability, I think I felt pretty comfortable doing it."* The number of interactions from the log underpin this. Further, the interaction with the tangible elements was not only easy but also fun and engaging. Participant 4: *"it's like a*

game," Participant 3: *"interacting with the actual device at the bus stop was also quite fun,"* and Participant 5: *"I would just use the system to have fun."*

Third, the place based approach is the reason for the interaction. Because it is part of the everyday environment, people can pass by and interact if they want. Participants 4 and 5 elaborated on this. Participant 5 said: *"if I was waiting or coming to the bus that was here, and I knew about this, I would sit here and vote until the bus came."* He also stated: *"I would not go to a web site and hit the yes/no button over and over again."* Participant 4 emphasised the convenience of having such an intervention in public space: *"because it's on my way to things it's convenient and embedded in the place."*

7 Conclusions

This study explored the contributions of using a situated approach for communicating local issues combining digital and tangible media. Our findings underline the significance of designing for situatedness, embedding visual content as a feedback mechanism, and tangible interactions. We are studying the interrelationship between these three aspects by performing a larger field study with the general public. However this small scale pilot study did show that the usage of place, digital, and tangible media can be beneficial for communicating local issues and engaging the public.

We are finalising two follow-up studies. The first follow-up study further explores the combination of the situated approach of Local Commons with the idea of asking for decisions as very simple tasks even in complex deliberation processes. Examining the role that task simplicity plays in improving casual participation, this study focusses on a public polling interface using the same tangible button interfaces (Steinberger, Foth, Alt 2014).

The second follow-up study – *The InstaBooth* – is currently underway. It seeks to refine and test a telephone booth-inspired portable structure that captures citizens' past stories and present opinions, particularly opinions regarding the use and design of public spaces. The aim is to employ design approaches to engage local communities in a situated debate on the future of their urban environment. We use tangible and hybrid interaction such as multi-touch screens and media façades to facilitate face-to-face and digitally mediated discussions (Johnstone, Caldwell, & Rittenbruch 2015).

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