



## **D4.1 State of the art overview of existing ways of involving a variety of stakeholders in the creation of and reflection on content creation within an urban context (Chapter I)**

Prepared by Paul Biedermann and Andrew Vande Moere

Research[x]Design - KU Leuven

Partners: KU Leuven, StudioDott, Bits of Love, NXP, VRT and BUUR

Date: 31/01/2019

# General Introduction & Content Overview

The current report represents **chapter I** of a multi-chapter document, which is continuously updated with the latest findings of task (T) 4.1: Knowledge Synthesis of work package (WP) 4: Interaction Design of the CityStory project. The central challenge of this WP is to understand how physical interaction components (e.g. installations in the city, mobile units) can be intertwined with digital interfaces (e.g. smartphones, public displays). The results documented in this report will further serve as input to inform the ongoing research activities of WP2 and WP3 and will be evaluated within WP5.

This particular chapter contains the findings of all research activities, carried out in between August 2019 (M01) and January 2020 (M05). It describes the process of an initial literature review to identify a set of state-of-the-art design interventions for the public creation of and reflection on content. The identified works have been categorized by the type of engagement they attempt to trigger, resulting in a preliminary framework, containing the four engagement types: Community communication, community inquiry, co-design interventions and reflection triggers. Based on this framework we identified a series of core challenges of citizen participation and created a list of design recommendations to counteract these challenges.

## Contents

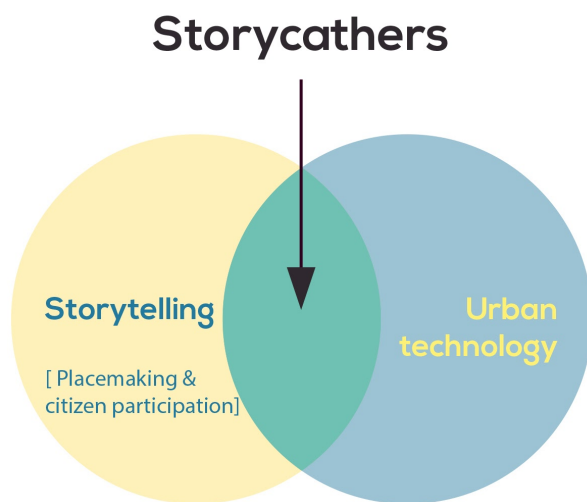
<b>1</b>	<b><i>Introduction</i></b> .....	<b>3</b>
<b>2</b>	<b><i>Methodology</i></b> .....	<b>3</b>
<b>3</b>	<b><i>Storycatcher Framework</i></b> .....	<b>4</b>
3.1	<b>Active and Passive Storycatchers:</b> .....	<b>4</b>
3.2	<b>Engagement Types</b> .....	<b>9</b>
<b>4</b>	<b><i>Challenges in Citizen Participation</i></b> .....	<b>19</b>
4.1	<b>Display blindness</b> .....	<b>19</b>
4.2	<b>Complexity of multiple citizens engaging at the same time</b> .....	<b>19</b>
4.3	<b>Fear of not being able to contribute</b> .....	<b>19</b>
4.4	<b>Evaluation apprehension</b> .....	<b>19</b>
<b>5</b>	<b><i>Design Considerations</i></b> .....	<b>20</b>
5.1	<b>Tacitcs of curiosity:</b> .....	<b>20</b>
5.2	<b>Playful engagement</b> .....	<b>20</b>
5.3	<b>Collaboration</b> .....	<b>20</b>
5.4	<b>Ownership / Giving a voice to the people</b> .....	<b>20</b>
5.5	<b>Feedback</b> .....	<b>20</b>
5.6	<b>Simplicity</b> .....	<b>20</b>
5.7	<b>Relevance:</b> .....	<b>21</b>
5.8	<b>Anonymity</b> .....	<b>22</b>
5.9	<b>Honeypot Effect</b> .....	<b>22</b>
5.10	<b>Ambiguity</b> .....	<b>23</b>

5.11	Trust .....	23
6	<b>Discussion</b> .....	24
6.1	Ownership vs. Simplicity .....	24
6.2	Playful vs. meaningful interaction .....	24
7	<b>Conclusion</b> .....	24
8	<b>Limitations</b> .....	24
9	<b>References</b> .....	24

## 1 Introduction

## 2 Methodology

To identify relevant literature, Google Scholar and the ACM library were used as primary sources for inquiry. Both databases were searched for related works using the following keywords: storytelling, urban participation, citizen participation, placemaking and urban planning. Resulting works that involve citizen-driven content creation or storytelling as a theme were selected for closer review (Figure 1.).



**Figure 1. Definition of Storycatchers**

Furthermore, projects other than those situated in urban contexts, which involve methods to trigger storytelling have been included, if they showed potential to be adapted within an urban setting. At this point the review includes 30 publications, reporting on a total of 32 design interventions. Out of the reviewed works, four engagement categories: community inquiry, communication platforms, reflection triggers and co-creation tools emerged, through which similar projects can be categorized. The collected interventions were then grouped into a framework and further examined on methods used to trigger and/or sustain storytelling, type of stories, as well as the used input and output mediums.

### 3 Storycatcher Framework

#### 3.1 Active and Passive Storycatchers:

Table 1. depicts a list of all reviewed projects to this date. To better understand what we consider a storycatcher, we use the two main categories: active and passive storycatchers.

Active storycatchers are design interventions, that enable direct storytelling through an interface. They provide different means to create a narrative, save the input temporarily or permanently and optionally broadcast the results to other citizens. Passive storycatchers whereas, help citizens to generate and display data, that is not a story in itself (e.g. polling results). For the story to emerge a human spectator is needed. This may happen during engagement with the intervention, when citizens exchange and discuss emerging results or afterwards, in form of follow up interviews or public meetings where findings are assigned meaning and communicated to the public.

Active Storycatchers			Passive Storycatchers		
Name	Ref.	Description	Name	Ref.	Description
Animato	[3]	Urban whiteboard that invites citizens to create stories using markers and graphical elements to regenerate urban places through participation.	Citizen Dialog Kit	[10]	Screen based intervention that allows citizens to create public polls and feed back data to inform fellow citizens
Byhøst	[11]	App to support citizens in exchanging map based foraging information	Fair Numbers	[12]	Polling intervention that prompts citizens to vote on perceptual factors and reflect on the results represented through data physicalisations

Capture the Moment	[13]	Urban screen that enables citizens to take situated snapshots as a medium for citizen engagement and communication	Flora Luma	[14]	Design intervention that prompts interaction between humans and plants to trigger reflection on the feelings of non-human entities
CitySpeak	[6]	Urban intervention that aims to support citizens to reclaim public space by enabling them to create and share content on public screens	MyPosition	[15]	Polling intervention that uses motion tracking to translate bodily movements into polling results and publicly visualizes them
CITYtalking	[9]	Booth like intervention that prompts citizens to share stories through anonymous conversation and broadcasts them to the public	Poster Vote	[16]	Polling intervention integrated in low tech posters to enable activists to collect data for public campaigns
Climate on the Wall	[17]	Urban intervention that allows citizens form expressions about climate change by engaging with an interactive projection	Street Infographics	[18]	Design intervention that augments street signs with contextually relevant data to empower onlookers to discover meaningful insights and elicit reflection, change or action

CO2nfessions	[17]	Booth like intervention that enables peoples to confess and record climate sins that a broadcasted through public displays	Traject Yourself	[19]	Design intervention that prompt engagement with spatially distributed displays to gather hyperlocal perceptions of passers-by about public space
Discussions in Space	[4]	Screen based intervention that allows citizens to respond to questions displayed on an urban screen to involve them in the consultation phase of urban planning projects	Viewpoint	[5]	Design intervention that allows selected city officials to create public polls, display real time results and communicate potential responses based on the generated data
DIY-Shrine	[9]	Booth like intervention that displays questions to prompt conversation between participants and broadcasts the results to the public	Visualizing Mill Road	[12]	Polling intervention that prompts citizens to vote on hyperlocal topics and reflect on the results represented through data physicalizations
IOT Ideation Cards	[20]	Social probe consisting of different sets of cards to engage people to craft future narratives about the home			

IOT Un-kit Experience	[20]	Social probe that uses initially unconnected and seemingly incomplete sensors to engage people in storytelling about the home			
Kerro Kartalla	[11]	Web application that allows citizens to be involved in the consultation phase of urban planning projects			
Loaded Dice	[20]	Social probe consisting of different sensors and a set of cards to engage people in storytelling about the home			
Maptionaire	[11]	Web application that allows citizens, planners and researchers to create surveys to be answered by other app users			
Madeira Story Generator	[21]	Screen based intervention designed to foster engagement and provoke visitors in collaborative storytelling.			
MR-Tent	[22]	Booth like intervention that uses mixed reality elements to support participants in expressing future visions for urban planning projects			

OpenWindow	[22]	Screen based intervention, allowing selected citizens to communicate user generated content to the public			
Stalltalk	[23]	Micro blog that allows citizens to open and comment on threads assigned to location-based barcodes			
The InstaBooth	[24]	Booth like intervention that uses tangible prototyping elements to support participants in expressing future visions for urban planning projects			
The Storytelling Machine	[25]	Screen based design intervention that uses user generated text and drawings to animate a real time collective story			
Travelling Suitcases	[26]	Social probe for recording and playing back place specific stories for the design of an interactive walking trail			



Ubinion	[27]	Screen based intervention that allows young people to upload and manipulate images by adding thought bubbles or protest signs as feedback on municipal issues to local youth workers			
Zwerm	[28]	Physical design intervention that utilizes different interaction elements to facilitate community activation and consolidation			

**Table 1. Overview of active and passive storycatchers**

### 3.2 Engagement Types

The categorizations above serve as a broad overview of different types of storycatchers. Yet, they do not say much about how such interventions are used and what types of storytelling they trigger. To address this, we mapped out all collected projects (Figure 1.) to seek for potential patterns in their appliances. Based on their purpose and communication flow, we identified the four main engagement types: community inquiry, community communication, co-design interventions and reflection triggers, that are described in more detail below (Figure 2).

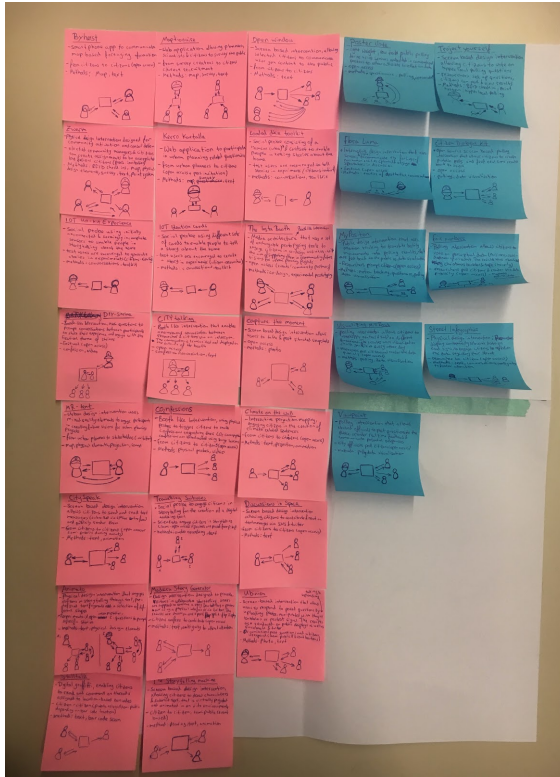


Figure 2. Overview of reviewed interventions

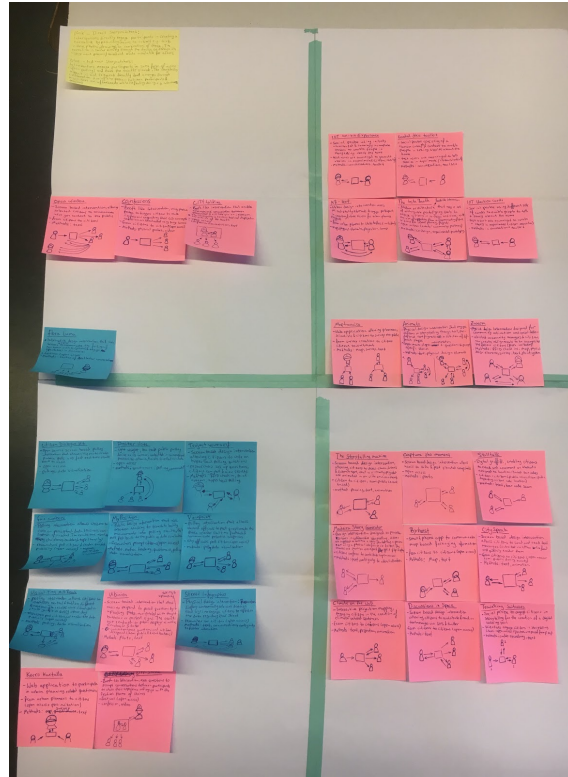


Figure 3. Sorted by engagement types

### 3.2.1 Community Inquiry

Interventions in the community inquiry category, are re-interpretations of conventional consultation processes. They can be divided into two subcategories: official inquiry, where selected power holders or researchers are in charge to pose questions to the public, and open inquiry platforms, that besides official entities also allow other citizens to create community inquiries. The aim of this engagement type is to simplify consultation processes to involve citizens that normally do not take part in public debate, such as the youth, time poor or seemingly impassive individuals [4]. A strong emphasis often lays in empowering marginalized communities or citizens who otherwise would not be heard [4, 5, 27]. Interventions within this category are both active storycatchers, enabling citizens to submit some sort of narrative in response to an inquiry, and passive storycatchers in form of polling devices, that collect votes on predefined answers. Table 2. details all reviewed projects within this category.

Official inquiry	Open inquiry
Discussions in Space	Citizen Dialog Kit
DIY-Shrine	Animato
Kerro Kartalla	Maptionnaire

MyPosition	Zwerm
PosterVote	
Traject yourself	
Ubinion	
Viewpoint	

**Table 2. Design interventions within the community inquiry category**

To further explain the nature of this engagement type, two examples: Discussions in Space and Animato are discussed in more detail.

#### Discussions in Space



**Figure 4. Students interacting with Discussions in Space at the University of Brisbane [4]**

Discussions in Space (Figure 3.) is a lightweight, technological design intervention, that aims to involve citizens in the consultation phase of urban planning projects carried out by the Brisbane City Council. It specifically tries to involve less interested younger residents as well as time poor professionals and families,

who usually do not participate in public debate. It does this by prompting specific questions on a public display to encourage direct, in-situ, real-time responses that are likewise publicly displayed. Besides the general concept, that is inviting in itself, the designers of the installation implemented various triggers to engage citizens to participate. Public exposure of the submitted messages for instance, encourages people to post, as they can directly understand that their opinions will actually reach someone.

A low entrance barrier (enabled by access through SMS and Twitter) allows participants to take advantage of the convenience of the installation and participate without any form of registration or need to follow complex instructions. Displaying the user generated feedback did not only help to share knowledge and empower people in having their say, but also sparked curiosity amongst others and encouraged them to engage by reading comments and contributing their own responses. The system automatically aligned unique (but pseudonymous) usernames, which gave the option to respond to posted comments by the convention “@user123” as used in Twitter. However, out of the 656 posts received throughout 15 testing days, only 12 were actually submitted in response to a previous message. The system also features a system to filter inappropriate messages to ensure an inoffensive and inviting environment. All remaining messages were categorized in on- and off-topic and marked as such on display. Off-topic messages were deliberately displayed as they can function as inspiration for others to send more meaningful messages and also create a positive vibe around the screen by giving people something to smile.

Animato



**Figure 5. Animato deployed at the Olohuone Festival in Turku, Finland [3]**

Animato is an interactive design intervention with the intend to create a shared space to encourage social participation in urban public places. The installation was set up to test two different forms of engagement: 1. citizen’s response to preselected questions and 2. an open canvas (Figure 4.) that invites citizens to unconditionally create and share stories with others. This, actually positions this work both in the community inquiry engagement type as well as the community communication type, described below. To achieve its aim, Animato makes use of a range of design elements meant to attract and involve citizens in storytelling. Originating from the idea of opening the linear structure of the city form, the installation is placed on stands opposing to singular walls, creating an aesthetic difference that sparks curiosity amongst passers-by. Further, the design provides a range of supportive tools to create a narrative, such as markers and three types of magnetic elements, including words, shapes and images. These carefully selected tools, including locally relevant elements to inspire citizens and free form of expression enabled through markers, offered playful ways of engagement that proved beneficial in stimulating engagement. Another important factor that triggered engagement is contextual relevance. By prompting questions regarding the city of Turku, facilitated by a volunteer of the festival, Animato offered a space to learn about the city and exchange information,

making interaction worthwhile for local residents. This simple but effective action appeared to be fruitful for producing responses of the public.

### 3.2.2 Community Communication

Interventions described in this engagement type are used to give a voice to citizens, by enabling them to share insightful needs, concerns or information with fellow citizens and/or policy makers. In contrast to community inquiry interventions, their focus is not to trigger response to a specific question but rather trigger participation and allow more open forms of content creation. They can be divided into two subcategories: two-way communication, through which citizens can post a story that is open for discussion or comment by others, and one-way communication, which does not include means for feedback unless spectators seek personal contact to story authors. Both are usually open for any type of citizen generated content, yet some of the reviewed interventions are designed to collect stories in regard to a specific theme such as sustainability [17] or foraging [11]. A specific focus which most interventions within this category share, lays on reclaiming public space, by allowing citizens to create content on mediums that are usually reserved for private and commercial interests, such as public displays [6]. Due to the open nature of this engagement type, all included interventions to this point are active storycatchers, enabling unconditional forms of citizen input. A full list of the reviewed community communication interventions can be found in Table 2.

2-way communication	1-way communication
Byhøst	CITYtalking
Capture the Moment	CO2nfessions
CitySpeaks	OpenWindow
Climate on the Wall	
Madeira Story Generator	
Stalltalk	
The Storytelling Machine	

**Table 3. Design interventions within the community inquiry category**

The two examples: CO2nfessions and Stalltalk are discussed further to explain the implications of this engagement type.

CO2nfessions



**Figure 6. CO2nfections (l) recording booth at an exhibition space in Aarhus, Denmark and (r) feedback system on a bus screen [17]**

Confessions is an advanced video installation, consisting of a recording booth (Figure 5. (l)), that allows people to “confess” their climate sins and commit themselves to a more active fight for better climate, as well as several distributed screens (Figure 5. (r)) that broadcast the collected videos to the citizens of Aarhus, Denmark. The aim of the installation is to put a face on the struggle for climate improvements and give a voice to local residents to be heard. To motivate people to their confessions, the booth contains a number of props for inspiration to convey the narrative people want to tell. Furthermore, by publicly showing the face of the participants, the installation enables them to take ownership over the content created and stand in for it. Through interviews with participants and spectators, the authors found mixed reactions to this type of communication. Some people found the personal exposure warranted due to urgency of the theme, while it created a too high entrance barrier for others, who did not find the theme interesting enough to engage with it. Generally, the interviews revealed that the communicative attitude based on motivation and realism was much preferred in contrast to dry facts and moral preaching. Mentioned reasons for participation included curiosity and peer pressure, while only one interviewee mentioned an interest in raising the focus for the

climate debate. This indicates, that the appreciation was related more to the immediate and playful engagement, rather than the possibility to create and disseminate valuable information.

Stalltalk



Figure 7. (l) Stalltalk QR code, (r) app interface [23]

Stalltalk (Figure 6.) is an anonymous location-based micro blogging website, that uses QR codes posted in bathroom stalls to enable people to create and like posts, tied to a specific location. The system does not allow participants to view or comment on a thread unless they are physically available at the location of the QR code, an authentication is not required. Stalltalk bases on the idea of bathroom graffiti, which allows people to unconditionally comment on their surroundings, as they cannot be held accountable for it. The primary trigger for engagement are the QR codes themselves, as they show a strong affordance for phone scanning. The creators deliberately decided to leave the rest of the sticker blank to spark additional curiosity and avoid that bathroom users would oversee them, as embellished QR codes often tend to be advertisements. Once a person scanned one of the codes, the anonymous nature and humorous approach of the interface sparked a diverse range of contributions. Posts included simple comments, such as greetings or questions regarding the intention of the blog but also more meaningful posts like confessions or a game, where different users wrote different parts of a fictional story. Through these simple means for participation almost 9000 unique visitors have created over 700 posts within 8 months of testing.

### 3.2.3 Co-Design Interventions

Interventions of this category are related to those of the community inquiry type, as they seek to engage citizens in different consultation processes to inform e.g. urban planning projects. Yet they differ in the way they engage people. While community inquiry interventions typically set on intangible forms of communication, such as text, video or audio to prompt people to tell a story, the focus in the co-design type lays on creating a tangible narrative to describe future visions or convey personal insights of a specific place. This is done by providing materials and tools to participants to support them in “designing” stories in response to a specific inquiry. From the reviewed works in this engagement type two subcategories emerged: probe interventions, in which design toolkits are handed out to participants and prototyping booths, which provide shelter to enable on-site prototyping. A special emphasis in this category is to connect citizens and policy makers or researchers to facilitate collaboration. Due to the higher complexity of interaction and need for facilitation, co-design interventions tend to be less inclusive for public engagement. Many, but not all interventions of this type, invite chosen citizens to participate, opposing to public access, that is more

common amongst interventions of the other engagement types. As the outcomes of this engagement type are rendered in tangible form, all interventions within this type can be described as active storycatchers. A full list of projects within this category is can be found in Table 2.

Probe interventions	Prototyping booths
IOT Ideation Cards	MR-Tent
IOT Un-kit Experience	The InstaBooth
Loaded Dice	
Travelling Suitcases	

**Table 4.: Design interventions within the co-design category**

To further elaborate on this engagement type, the following two examples are further discussed: Travelling suitcases and The Instabooth.

### Travelling

### Suitcases



GSM phone in 3D printed case. An Interactive Voice Responsive system allows to record, save and listen stories on the suitcases and upload them to a web-page.

**Figure 8. Different interaction elements of travelling Suitcases [26]**

Travelling Suitcases is a design intervention, created to enable residents of the Oreth Park estate in SE London to share place specific memories about their neighborhood. The aim is to integrate the resulting stories for the creation of an interactive walking trail, supporting community building amongst those living on the site. Each of the suitcases provides different means (Figure. 7), to record new and listen to previous



stories such as writable cards to frame questions for fellow residents, a GSM phone for audio recording and space to attach photographs. The suitcase itself contains everything needed to record a story, it does not require any external devices such as smartphones or computers to make it more inclusive for elderly or less technically savvy residents. Further, the interaction elements are carefully designed, using visual affordances, such as the telephone handset to record and listen to sound files. For the study, the researchers handed out four of the suitcases to people living on the estate. Through the portable design, the suitcases enable residents to capture stories at their own pace and place of choice. After recording a story, participants were briefed to pass the suitcase to another resident of their choice. This method helped to collect diverse stories from multiple residents and encouraged personal agency by giving responsibility over the suitcase and control of who will be invited to contribute a story. More than only stories, the wider narrative of photos, handwritten questions and audio recordings, inspired participants to engage with previous contributions and co-create a larger narrative by adding their own valuable insights. Follow up interviews revealed that the suitcases were seen as something for the people and not a corporate promotional tool, which was one of the main drivers for participants to share personal stories. This suggests that providing direct value for a community can help to build trust relationships and trigger meaningful participation.

### The Instabooth



**Figure 9. The Instabooth [24]**

The Instabooth (Figure 8.) is a DIY/Do-It-With-Others media architecture prototype, used for public consultation and giving a voice to citizens to take part in urban planning projects. It specifically focuses on bringing together citizens of different professional backgrounds to facilitate the creation of dialogue and sharing of ideas. It does this by providing a multitude of interactive and playful components, that support participants in drawing a picture, writing a note, tweeting a message, voting on a picture, or even giving a hug, enabling a larger cross section of the public to participate, regardless of their technical knowledge, access to technology or literacy. This form of experiential prototyping did not only engage citizens in a fun activity, but also enabled them to explore different ideas and generate creative outcomes. Another important factor to promote participation, is the situatedness of the InstaBooth. By placing the prototype in public urban places, it allows participants to engage directly with the context in question. Further, it allows to display text or image generated by participants to the outside as a form of additional inquiry, enabling passersby to engage and to draw attention to the booth itself.

### 3.2.4 Reflection Triggers

Reflection trigger interventions, all share the common goal to prompt people to reflect on a specific topic and share their opinion. In all cases this is approached by presenting different forms of data visualization to passersby. None of the projects within this engagement type features means to share or archive reflections in form of a story via their proposed systems. All projects are thus considered to be passive storycatchers. The storytelling itself occurs amongst spectators during collaboration [12], during conversations with others after interacting [18] or in form of dialogue [14] or follow up interviews [12, 18] with the designers of the project. Table 5 contains an overview of all reviewed projects within this engagement type.

Reflection triggers
Flora Luma
Fair Numbers
Visualizing Millroad
Street Infographics

**Table 5.: Design interventions within the reflection triggers category**

The two projects: Street Infographics and Visualizing Mill Road are discussed in more detail to elaborate on the nature of this engagement type.

#### Street Infographics



**Figure 10. Street Infographics [18]**

Street Infographics is an urban intervention, that visually represents sociodemographic data, relevant for the specific location of deployment. It is designed to inform people, trigger reflection and steer social interaction. The data is visualized in form of non-digital displays that are attached to existing street signs (Figure 9.). In contrast to other public design interventions that usually build on maximized visibility, Street Infographics deliberately blends in with the existing urban fabric to create a sense of ambiguity. Through field observations an average of 31% views were recorded, of which half stopped to read the information displayed. Follow up interviews revealed that passersby who stopped, tended to be residents of that street who were more sensitive to changes in their everyday environment. Yet, this suggests that even minimal, subtle interventions can draw

the attention of passersby. Further the study found that the contextual relevance of the signs helped to engage citizens in reflection. Some even returned to show the signs to their friends and family to collaboratively discuss the displayed data. The direct link between data and location proved to trigger around half of the onlookers to search for further signs to compare and make sense of the data. The authors also suggest that the ambiguous integration as part of the official street signs, added to the acceptance and endurance of the visualization, as people were unsure whether the signs were actually art, propaganda or part of an official campaign. As identified in previous studies around public displays, the authors observed that a single onlooker can cause a honey pot effect, attracting more people to the sign and create social interaction between spectators.

### Visualizing Mill Road



**Figure 11. Visualizing Mill Road (l) polling interface (r) non-permanent chalk graffiti visualization [12]**

Visualizing Mill Road is an interactive design intervention, concerned with triggering discussion and reflection on different topics, relating to the Mill Road community in Cambridge. It specifically aims to challenge pre-existing perceptions amongst the two demographically divided neighborhoods of the street. By allowing residents from both communities to learn more about the opinions held within the other, it brings together communities and facilitates dialogue. The system gathers data, through tangible polling interfaces (Figure 9. (l)), deployed throughout the neighborhood. Chalk graffiti is used to publicly visualize the updated results every other day (Figure 9. (r)). The observations of the study have shown that the visualizations attracted a large amount of attention from residents, triggering them to actively compare results of different polling locations, regularly return to view updated results, and to share anecdotes and opinions on site. Through follow up interviews, the researchers found that the horizontal positioning of the displays played an important role in attracting passers-by attention, as many people naturally look at the ground while walking. Further, the embodied experience of walking over the chalk is quite different from looking up at a display. Another engaging factor where the delayed updates. The intervals quickly became an anticipated event, triggering residents to return, knowing that more information will be added. Lastly, the transience of the data, communicated by the temporary nature of the chalk made the data seem more ‘special’, as passers-by were aware that the information would fade within weeks.

## 4 Challenges in Citizen Participation

Throughout this literature review, several challenges regarding citizen participation were identified. The following section is dedicated to those. It reports on common issues and provides design implications that have been used to counteract these issues.

### 4.1 Display blindness

### 4.2 Complexity of multiple citizens engaging at the same time

### 4.3 Fear of not being able to contribute

### 4.4 Evaluation apprehension

## 5 Design Considerations

The following section examines methods used for the facilitation of citizen engagement. The collection includes approaches that have been repeatedly applied within the reviewed works. Some function as main driver for participation, others are rather of supportive character. To date, it includes XXX different means to spark citizen engagement with interactive systems. All reviewed studies utilize at least one of them, however the majority deploys a combination of several methods described below:

### 5.1 Tacitcs of curiosity:

### 5.2 Playful engagement

### 5.3 Collaboration

### 5.4 Ownership / Giving a voice to the people

### 5.5 Feedback

Most public interfaces within this review, were designed to collect citizens feedback to either inform planned interventions or disseminate information and knowledge amongst citizens. While feedback is usually accessible to the organizations behind an interface, it is not always the case for the participants themselves. For them, it often remains unclear if and how their contribution can inform decision making processes or public debate. The absence of feedback can demotivate participants and discourage ongoing participation. [16] for instance, identified the lack of immediate feedback as one of the main limitations of their public polling intervention PosterVote, as users were not able to sense whether or not their vote has been casted. Conversely, immediate feedback can serve to raise a system's credibility by visually assuring participants that their vote has been counted [5]. Text-based interventions, that allow for richer kinds of contributions can likewise profit from visualizing received messages. [4] for instance, found that exposure of user generated contributions can stimulate observers intend to receive the same public recognition for their views, motivating them to post their own opinions. They further report that displaying previous posts served as inspiration for participants to create elaborative posts or directly respond to previous messages.

However, there are not only advantages of providing feedback. In case of public polling interventions, exposure of the results prior to interaction may be even counterproductive. [5] argue that voters may get persuaded to vote with the majority or feel that voting is futile if their choice is amongst the minority. Similar observations were made by [15], who report that participants in their polling intervention felt inclined to follow the mainstream opinion due to the public nature of the voting process (see also section XXX Anonymity). A simple, yet effective way to circumvent this problem could be to render polling results after the interaction. In this way participants can unbiasedly cast their vote and still observe the ongoing progress of the poll.

Another important factor to consider when designing feedback devices, is the community itself. Especially in disadvantaged areas, where residents are regularly consulted but rarely experience any action taken, a sense of 'consultation fatigue' can emerge. Even though ViewPoint [5] provided immediate audiovisual feedback when casting a vote, as well as a function for interventionists to communicate decisions back to the public, the designers still faced difficulties to establish trust in the proclaimed changes. To counteract consultation fatigue, they suggest considering short-term deployments only when consultation is actually needed instead of permanent setups. In this way organizations can commit in advance to take action based on the results and the novelty effect of the device remains [5].

### 5.6 Simplicity

To allow for opportunistic participation, there is a common perception that public interventions should be designed as simple and effortless as possible. If too much understanding or prior knowledge is required,

engagement and overall performance can be negatively impaired. [10] found that narratives can aid comprehension and steer participation. They also report that when understanding was lost, users did not further engage with their system. Climate on the wall [17] is an interactive projection installation, that allows passersby to drag projected words over a façade to form sentences. When a person would pass the façade the words in his/her direct vicinity would start moving, hinting towards its interaction opportunities. Through this ‘unavoidable’ bodily engagement, the designers achieved high levels of engagement. However, as the majority perceived the interface as too complicated, participation remained mostly to dragging around words, instead of forming actual sentences. These cases demonstrate how simplicity and accessibility can trigger opportunistic participation. Yet they also show that a low entrance barrier or well-designed call to action alone is not sufficient to ensure meaningful contributions. Once citizens start to interact with a system it should provide consistently comprehensible means to execute the desired contribution.

Several interventions e.g. [4, 6, 23] exploit the widespread availability of personal computing devices to facilitate communication between physical installations and citizens. Social media formats provide already accessible means to create, share and comment stories. They also reveal demographic information of participants, that may help to make sense of received contributions. On the other hand, this may lead to increased fear of social embarrassment (see also section XXX Anonymity). Also, any third-party service usually requires prior registration, which again increases the threshold for participation. For instance in [4], which allowed contributions via SMS and Twitter, the authors received 607 short messages in contrast to 49 tweets over a 15 days trial period. These findings suggest that simple and well-established mechanisms can be more efficient drivers for participation. When evaluating an early prototype of Viewpoint, [5] noted that several interviewees suggested a physical interface over the current implementation using SMS for a more situated interaction. Considering that not every person owns a mobile phone or is carrying one while encountering a public interface, such systems are at risk of excluding those individuals. To be more inclusive towards not digitally connected people, interventionists could consider integrated authoring tools, such as keyboards [21], cameras [13], microphones [26] or sketching interfaces [24], allowing citizens to contribute without the need for own devices.

In any case, interventions can profit from well considered affordances, that allow people to intuitively anticipate included functions and interaction flows. In Stalltalk [23] for instance, the authors found that a blank QR-code, placed in a bathroom stall, was sufficiently incentive for people to scan it and contribute stories to an attached microblog. In travelling suitcases [26] an ordinary telephone handset empowered also elderly people to record and play back audio files by anticipating its functions.

## 5.7 Relevance:

In nowadays fast-moving times, people are often busy and preoccupied with work or other everyday tasks. In order to convey passers-by to stop and engage, a public interface needs to provide some kind of added value for that person. In other words, the provided content must be relevant to the perception of its potential users.

Content should not only be relevant to a specific place [11, 24], but also address citizens current needs and goals [4, 27]. One effective way to ensure relevance is to empower citizens in creating their own content. This can be achieved by providing a platform to connect communities and exchange thoughts and ideas. An effective call to action to spark curiosity and discussion can be to directly ask for response to locally relevant topics [3].

Besides enabling user generated content, design interventions can already benefit from potential users input during the design process. One way to create relevant systems is to directly involve affected communities in co-design processes [5, 24, 28]. In this way, citizens can exchange ideas with designers and developers and actively take part in tailoring aesthetics and functions to the needs of their community.

Another important consideration to improve the relevance of public interfaces is to keep the content up to date. Outdated content makes it more difficult for users to identify relevant information, thus discouraging

engagement with a system [30]. Through follow up interviews with participants, [18] found that some citizens recurrently visited their urban visualization to check for updated information. Further, [12] argue that delayed updates can be a powerful method to engage people as it allows for the content to slowly unfold over time. By arranging regular and fixed moments to update content, they achieved a sense of anticipation that motivated community members to return at the appropriate moments.

## 5.8 Anonymity

Ensuring a sense of privacy can help to reduce social embarrassment and thus facilitate genuine contributions. There is evidence that anonymous participation can empower citizens to unreservedly speak their mind, as they can't be held accountable for their opinions. Through the design process of Viewpoint, [5] found that many residents were uncomfortable having their voice heard publicly. Not because they did not have an opinion, but out of fear to be perceived as interfering by other residents. Through interviews with the youth for the design of Ubinion—a photo-based communication platform—[27] reported similar findings. Several of their interviewees expressed a need for anonymity when giving feedback or suggestions. In this case it was to avoid being contacted after the interaction to avoid any additional workload. [15] explored how different levels of anonymity would affect participation of passers-by. Their interactive polling intervention MyPosition would collect and publicly display votes with an image of the voter, the voter's contour or simply a plane colour. The authors report on no major differences between the contour and colour mode, while significantly less people participated when pictures of other voters were shown. These findings support the assumption that citizens are more eager to contribute opinions when they are less recognizable. However, the freedom of anonymity can also trigger deindividuation [31], which often leads to inappropriate or off-topic contributions. The anonymous nature of Stalltalk [23] for instance, proved to be beneficial in motivating participants to contribute a broad range of personal stories, however, a closer look at these contributions reveals that the majority comprised dirty jokes. While not particularly undesired in Stalltalk, the option to anonymously contribute in more serious applications can pose certain difficulties. Throughout the deployment of Discussions in Space [4], which likewise features anonymous participation, its creators received only 26% on-topic contributions in response to their inquiries, while 48% were off-topic and 26% considered to be offensive or inappropriate. Designers of public interfaces that allow anonymous contributions should consider clear rules and moderation to avoid false or malicious content [31]. The quality control system in [4] did not display any inappropriate posts to ensure an inoffensive and inviting environment. Follow up interviews showed that such system was greatly appreciated amongst participants, many interviewees even asked for a more rigorous censorship that would also restrict contributions that do not address the posted questions.

## 5.9 Honeypot Effect

The honeypot effect describes how the engagement of people in interactive systems can passively trigger passers-by to observe, approach and engage with that system. It is a social learning influence that is often observed, when passers-by approach a system to evaluate whether or not it is enjoyable or worthy of their attention [32]. It has been observed that engaging people to interact in public, becomes more challenging, in the absence of any pre-existing participants, as the fear of social embarrassment is perceived much higher [29]. Ubinion is a screen-based urban intervention that facilitates dialogue in between citizens and municipality. It allows citizens to capture a selfie and add customized messages to the image. Through testing the system, [27] have observed a very strong honeypot effect, when broadcasting the webcam view on a large public screen. This attracted people in the direct vicinity of the system to position themselves in the back of photos taken by other participants. In contrast, [21] report on the absence of any honeypot effect during the deployment of Madeira Story Generator, that uses an airport split flap display for visualization. Instead of the embodied engagement of Ubinion, their system utilizes a keyboard as input medium for text. This suggests that the sheer size and visibility of an intervention, is not exclusively decisive for passers-by engagement but also the type of interaction. [13] further point out that the age of participants plays a significant role within the honeypot effect. Through their study around the moment machine, a display-

attached camera to capture situated snapshots, they found that kids would often engage with their installation, after observing other kids using it. Vice versa, the authors argue that observing engagement of people from different age groups might discourage others from participation, as revealed through follow up interviews.

However, there exist various ways to leverage the honeypot effect in order to increase participation in interactive systems. Through the evaluation study of encounters, an interactive performance generator, the authors propose a range of design implications to increase the honeypot effect. Those specifically emphasize the value of space and interaction between the intervention, participants and observers. Space should be provided in the nearby and uninterrupted visibility of an intervention; it should provide opportunities to approach and learn from others but also accommodate for the absence of interaction to comfort passive audience members [29]. A potential way to encourage peer learning is to spatially force people who are leaving an intervention, to meet or pass those who are not (yet) participating, to enable sharing of particular experiences. To avoid people dropping out due to external reasons, such as limited usability or insufficient enjoyment, a system should enable for different degrees of engagement and allow people to seamlessly leave and re-enter the intervention space at any time [29]. Another means to increase the honeypot effect is to implement collaborative efforts that foster curiosity amongst bystanders and participants to discover (hidden) features and positively influence the overall social experience [29].

## 5.10 Ambiguity

A rather underexplored, yet thought provoking means to stimulate citizen engagement is the deliberate creation of ambiguity. [33] argue that impelling people to interpret situations for themselves, can encourage them to conceptually grapple with systems and their contexts, and thus establish deeper and more personal relations with the meanings offered by those systems. They further distinguish three principal kinds of ambiguity: ambiguity of information (uncertainties in displayed information), ambiguity of context (how we understand things in different contexts), and ambiguity of relationship (projections of subjective experience onto new situations). In Street Infographics [18] for instance, the source of the publicly displayed data was deliberately stated in a less obvious way on the back of the signs, to create doubt and provoke independent judgement. This led spectators to additionally reflect on the purpose of the sign and further, triggered the majority of interviewees to ask whether the displayed data is up to date. Two individuals even reported returning to the signs on a daily basis to see if the data has been updated. With the Madeira Story Generator [21], the designers explore ambiguity of context, by removing an airport split flap display from its natural habitat—an airport—and deploying it in a different place, as well as ambiguity of information by using it to display user generated stories instead of flight information. Observations during deployment have shown that the ambiguous placement of the installation was indeed a positive factor, that sparked interest and curiosity amongst passers-by. The ambiguity of information first baffled spectators but over time, continuous interest in the installation led people to realize that the content displayed was user generated. The authors thus argue that ambiguity can trigger curiosity and engagement in the right conditions, yet special attention is needed to avoid confusion of users [21].

## 5.11 Trust

In order to maintain participation, a public intervention needs to achieve a certain sense of trust. If citizens do not trust in an interface or the type of content it provides, their belief in its meaning decreases, which can negatively affect contributions. Based on the reviewed literature, 3 key aspects to preserve trust have been identified:

*Transparency:* [34] found that users hesitated to contribute data when they were not sure which organization was collecting it and in what ways it will be used. This indicates that participation could be increased when a public interface can be clearly associated to a specific organization or person that collects the data.

*Feedback:* Interviews with users of the public polling intervention PosterVote [16] revealed that participants were critical about the design as it only collected votes but did not provide direct feedback. This generated a sense of doubt of whether or not a contribution would actually have an impact. While Viewpoint [5], included

a real-time visualization of the polling results, the authors experienced mistrust amongst the community as they did not feel that policy-makers would initiate change based on their contributions. A consideration to improve participation in future interventions could be to establish a direct link between citizens needs and (planned) efforts from the interventionists side.

*Credibility*: concerns the displayed information as well as the process of data collection. [18] argue that any publicly displayed information should be correct and up to date. It should allow viewers to understand where the data is originating from and how it was generated. Further, [5] found that credibility directly relates to the interaction design of an interactive interface. For instance, their polling intervention, did not prevent multiple votes, which made the resulting data appear questionable and potentially demotivated citizen participation.

## **6 Discussion**

### **6.1 Ownership vs. Simplicity**

### **6.2 Playful vs. meaningful interaction**

## **7 Conclusion**

## **8 Limitations**

## **9 References**

[1] Golobič, M. and Marušič, I. Developing an Integrated Approach for Public Participation: A Case of Land-Use Planning in Slovenia. *Environment and Planning B: Planning and Design*, 34, 6 (2016), 993-1010.

[2] Arnstein, S. R. A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*, 35, 4 (1969), 216-224.

[3] Viña, S. Engaging People in the Public Space - ANIMATO a Design Intervention. In *Proceedings of the 11th Biennial Participatory Design Conference* (Sydney, Australia, 2010), [insert City of Publication],[insert 2010 of Publication].

[4] Schroeter, R. Engaging new digital locals with interactive urban screens to collaboratively improve the city

. In *Proceedings of the conference on Computer Supported Cooperative Work* (Seattle, Washington, USA, 2012), [insert City of Publication],[insert 2012 of Publication].

[5] Taylor, N., Marshall, J., Blum-Ross, A., Mills, J., Rogers, J., Egglestone, P., Frohlich, D., Wright, P. and Olivier, P. Viewpoint: Empowering Communities with Situated Voting

Devices. In *Proceedings of the CHI '12: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Austin, Texas, USA, 2012), [insert City of Publication],[insert 2012 of Publication].



- [6] Lévesque, M., Bélanger, L. and Lewis, J. Cityspeak's Reconfiguration of Public Media Space. *Journal of the Mobile Digital Commons Network*, 1 (2006).
- [7] Nah, S., Namkoong, K., Chen, N.-T. N. and Hustedde, R. J. A communicative approach to community development: the effect of neighborhood storytelling network on civic participation. *Community Development*, 47, 1 (2015), 11-28.
- [8] Black, L. W. Deliberation, Storytelling, and Dialogic Moments. *Communication Theory*, 18, 1 (2008), 93-116.
- [9] Johnstone, S., Caldwell, G. A. and Rittenbruch, M. Defining the InstaBooth : Facilitating debate and content creation from situated users. In *Proceedings of the MEDIACITY 5 International Conference* (2015), [insert City of Publication],[insert 2015 of Publication].
- [10] Coenen, J., Houben, M. and Vande Moere, A. Citizen Dialogue Kit. In *Proceedings of the Companion Publication of the 2019 on Designing Interactive Systems Conference 2019 Companion - DIS '19 Companion*(2019), [insert City of Publication],[insert 2019 of Publication].
- [11] Møller, M. S., Olafsson, A. S., Vierikko, K., Sehested, K., Elands, B., Buijs, A. and van den Bosch, C. K. Participation through place-based e-tools: A valuable resource for urban green infrastructure governance? *Urban Forestry & Urban Greening*, 40 (2018), 245-253.
- [12] Koeman, L., Kalnikaitė, V., Rogers, Y. and Bird, J. What Chalk and Tape Can Tell Us: Lessons Learnt for Next Generation Urban Displays. In *Proceedings of the Proceedings of The International Symposium on Pervasive Displays - PerDis '14* (2014), [insert City of Publication],[insert 2014 of Publication].
- [13] Memarovic, N., Fatah gen Schieck, A., Schnädelbach, H. M., Kostopoulou, E., North, S. and Ye, L. Capture the Moment: "In the Wild" Longitudinal Case Study of Situated Snapshots Captured Through an Urban Screen in a Community Setting. In *Proceedings of the Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW '15* (2015), [insert City of Publication],[insert 2015 of Publication].
- [14] Frankjaer, R. Fostering Care and Peaceful Multispecies Coexistence with Agential Prototypes. In *Proceedings of the 23rd International Symposium on Electronic Arts* (Manizales, Colombia, 2017), [insert City of Publication],[insert 2017 of Publication].
- [15] Valkanova, N., Walter, R., Vande Moere, A. and Müller, J. MyPosition: sparking civic discourse by a public interactive poll visualization. In *Proceedings of the 17th*

*ACM conference on Computer supported cooperative work & social computing* (Baltimore, Maryland, USA, 2014), [insert City of Publication],[insert 2014 of Publication].

[16] Vlachokyriakos, V., Comber, R., Ladha, K., Taylor, N., Dunphy, P., McCorry, P. and Olivier, P. PosterVote: Expanding the Action Repertoire for Local

Political Activism. In *Proceedings of the Proceedings of the 2014 conference on Designing interactive systems - DIS '14* (2014), [insert City of Publication],[insert 2014 of Publication].

[17] Fritsch, J. and Brynskov, M. Between engagement and information:

Experimental urban media in the climate change debate. In *Proceedings of the 4th conference of Communities and Technologies* (Pennsylvania State University, 2009), [insert City of Publication],[insert 2009 of Publication].

[18] Claes, S. and Vande Moere, A. Street Infographics: Raising Awareness of Local Issues

through a Situated Urban Visualization. In *Proceedings of the Proceedings of the 2nd. ACM International Symposium on Pervasive Displays* (Mountain View, CA, USA, 2013), [insert City of Publication],[insert 2013 of Publication].

[19] Coenen, J., Nofal, E. and Vande Moere, A. How the Arrangement of Content and Location Impact the Use of Multiple Distributed Public Displays. In *Proceedings of the Proceedings of the 2019 on Designing Interactive Systems Conference - DIS '19* (2019), [insert City of Publication],[insert 2019 of Publication].

[20] Berger, A., Ambe, A. H., Soro, A., De Roeck, D. and Brereton, M. The Stories People Tell About The Home Through IoT Toolkits. In *Proceedings of the Proceedings of the 2019 on Designing Interactive Systems Conference - DIS '19* (2019), [insert City of Publication],[insert 2019 of Publication].

[21] Jorge, C., Nisi, V., Nunes, N., Innella, G., Caldeira, M. and Sousa, D. Ambiguity in Design: An Airport Split-Flap Display Storytelling Installation. In *Proceedings of the CHI* (Paris, France, 2013), [insert City of Publication],[insert 2013 of Publication].

[22] Wagner, I., Basile, M., Ehrenstrasser, L., Maquil, V., Terrin, J.-J. and Wagner, M. *Supporting Community Engagement in the City:*

*Urban Planning in the MR-Tent.* City, 2009.

[23] Friedmann, J. and Horn, M. StallTalk: Graffiti, Toilets, and

Anonymous Location Based Micro

Blogging. In *Proceedings of the CHI* (Paris, France, 2013), [insert City of Publication],[insert 2013 of Publication].

- [24] Caldwell, G. A., Guaralda, M., Donovan, J. and Rittenbruch, M. The InstaBooth: Making Common Ground for Media Architectural Design. In *Proceedings of the Proceedings of the 3rd Conference on Media Architecture Biennale - MAB (2016)*, [insert City of Publication],[insert 2016 of Publication].
- [25] Sargeant, B., Dwyer, J. and Mueller, F. F. The Storytelling Machine: A Playful Participatory Automated System Featuring Crowd-Sourced Story Content. In *Proceedings of the Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts - CHI PLAY '18 Extended Abstracts (2018)*, [insert City of Publication],[insert 2018 of Publication].
- [26] Crivellaro, C., Taylor, A., Vlachokyriakos, V., Comber, R., Nissen, B. and Wright, P. Re-Making Places: HCI, 'Community Building' and Change. In *Proceedings of the Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16 (2016)*, [insert City of Publication],[insert 2016 of Publication].
- [27] Hosio, S., Kostakos, V. and Kukka, H. From School Food to Skate Parks in a few Clicks: Using Public Displays to Bootstrap Civic Engagement of the Young. In *Proceedings of the International Conference on Pervasive Computing (2012)*, [insert City of Publication],[insert 2012 of Publication].
- [28] Coenen, T., Mechant, P., Laureyssens, T., Claeys, L. and Criel, J. ZWERM: stimulating urban neighborhood self-organization through gamification. In *Proceedings of the International conference Using ICT, Social Media and Mobile Technologies to Foster Self-Organisation in Urban and Neighbourhood Governance (2013)*, [insert City of Publication],[insert 2013 of Publication].
- [29] Wouters, N., Downs, J., Harrop, M., Cox, T., Oliveira, E., Webber, S., Vetere, F. and Vande Moere, A. Uncovering the Honeypot Effect. In *Proceedings of the Proceedings of the 2016 ACM Conference on Designing Interactive Systems - DIS '16 (2016)*, [insert City of Publication],[insert 2016 of Publication].
- [30] Rodriguez, M., Andrade, Á., González, M. L. and Morán, A. Disseminating and Sharing Information Through Time-Aware Public Displays. In *Proceedings of (2007)*, [insert City of Publication],[insert 2007 of Publication].
- [31] Michielsen, D., Dalle, T., Usai, M., Romero, R. and Pak, B. Learning Participatory Urban Research Towards a Network of Collective Ingenuity (OURB). In *Proceedings of the ShoCK!-Sharing Computational Knowledge!-Proceedings of the 35th eCAADe Conference (2017)*, [insert City of Publication],[insert 2017 of Publication].
- [32] Brignull, H. and Rogers, Y. Enticing People to Interact with Large Public Displays in Public Spaces. In *Proceedings of the In Proceedings of IFIP TC13 International*

*Conference on Human-Computer Interaction (Interact*

'03) (Mumbai, India, 2003), [insert City of Publication],[insert 2003 of Publication].

[33] Gaver, W. W., Beaver, J. and Benford, S. Ambiguity as a Resource for Design. In *Proceedings of the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Lauderdale, USA, 2003), [insert City of Publication],[insert 2003 of Publication].

[34] Hosio, S., Alorwu, A., van Berkel, N., López, M. B., Seetharaman, M., Oppenlaender, J. and Goncalves, J. Fueling AI with public displays? In *Proceedings of the Proceedings of the 8th ACM International Symposium on Pervasive Displays* (2019), [insert City of Publication],[insert 2019 of Publication].