

Creator-Centric Study of Digital Art Exhibitions on Interactive Public Displays

Hannu Kukka¹, Johanna Ylipulli¹, Jorge Goncalves², Timo Ojala¹, Matias Kukka¹, Mirja Syrjälä¹

¹ Center for Ubiquitous Computing, University of Oulu, Finland

firstname.lastname@oulu.fi

² University of Melbourne, Australia

firstname.lastname@unimelb.edu.au

ABSTRACT

We present a mixed-methods study aimed at assessing artists' experiences of a digital art exhibition service, called StreetGallery, on a network of interactive displays situated in public urban locations. We ground our analysis using survey responses and in-depth interviews of artists who have exhibited their art in StreetGallery over the years. Findings from these studies indicate that the artists highly value StreetGallery's open and egalitarian access to art, and its contribution towards fusing novel digital technologies and art in public urban spaces. We conclude that platforms such as StreetGallery have the potential to challenge traditional paradigms of art gallery practices and public urban spaces as a stage for consumption and commerce.

Author Keywords

Digital art; interactive public displays; longitudinal deployment; in-the-wild; qualitative research; urban computing

ACM Classification Keywords

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

INTRODUCTION

Contemporary urban spaces have become nearly inseparable from the various forms of technological elements embedded in them. Mobile phones, Global Positioning System (GPS) devices, various sensing and tracking systems, large digital surfaces, and ubiquitous wireless networks have given birth to hybrid spaces that closely follow the ideals of ubiquitous and pervasive computing, thoroughly structured by microprocessors and connectivity. This development has enabled artists to begin appropriating the myriad of technologies situated in these public spaces. The term 'locative media' was first introduced as the title of a

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MUM 2017, November 26–29, 2017, Stuttgart, Germany

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ACM ISBN 978-1-4503-5378-6/17/11...\$15.00

<https://doi.org/10.1145/3152832.3152835>

workshop in 2003, and later defined as “[a] response to the *de-corporealized, screen-based experience of net art, claiming the world beyond either gallery or computer screen as its territory*” [29]. An extension to locative media, *locative art* can be considered as a liberation from the pressure to define digital art with respect to its modes and places of presentation by moving art to the public space of the streets [9].

In this paper, we explore artists' experiences of exhibiting their digital art pieces on a network of interactive public displays operational in the city of Oulu, Finland since June 2009. The display network comprises of over a dozen¹ units situated in central indoor and outdoor locations in Oulu (Figure 1). The display network is described in detail in e.g. [20,23,24], but in brief the displays are multipurpose devices serving both commercial broadcast information as well as a host of interactive information and entertainment services to the residents and visitors of Oulu.



Figure 1. Public displays used for hosting StreetGallery.

This paper provides an in-depth analysis of one of these services, an interactive and free-of-charge gallery for professional and amateur artists to exhibit their work utilizing the eminent visual capabilities of 55” high-definition LCD-panels situated in key urban locations including the city's main library building, the local Cultural

¹ The exact number of display devices has fluctuated over the years, with new displays being added and temporary periods when some devices have been offline for various technical reasons

Centre, and several locations along the city's main shopping streets. The service, named *StreetGallery*, was among the first services to be implemented for the display network, and the inaugural exhibition was launched in July 2009. During the selected observation period of 75 months (July 2009 - September 2015), *StreetGallery* has hosted 66 exhibitions by individual artists and collectives, with several new exhibitions continuously in queue. At the time of writing (August 2016), new exhibitions have been booked far into year 2017, demonstrating the popularity of the gallery among the local artist community.

Shamma and Shaw [24] identify two groups of models for new media art, namely *creator-centric* and *experiencer-centric*. The former focuses on the construction of artifacts or experiences that seek to describe a space of possibilities for creators, to explore and to prescribe a method for undertaking that exploration. The latter focuses on the experience of the viewer as a piece of art reveals itself. In this paper, we focus mostly on the *creator-centric* view of *StreetGallery*, and study the experience of the artists who have adopted *StreetGallery* as an outlet for their creative works. Hence, the *experiencer-centric* view is intentionally left out of the scope of this paper, although we will discuss certain elements regarding usage to provide a more comprehensive grounding for discussion.

We will structure our exploration on this new ubiquitous presentation platform for arts through questionnaire responses from 17 artists, and in-depth interview data collected from 8 artists who have exhibited their works in *StreetGallery* over the years. We will also complement the discussion through analysis of quantitative usage data from the 75-month deployment in order to provide the reader with a better understanding of the audience reach made possible by the display network.

ARTS, TECHNOLOGY, AND THE CITY

Art as a physical object has undergone a significant paradigm shift in the 20th century. Dematerialized art is now exemplified by digital media, and what used to be a one-way relationship between the viewer and the piece has moved towards a more reciprocal relationship where the viewer becomes a part of the composition. Dinkla has previously drawn attention to the way digital media works against the fetishization of the art object, instead opening up "*alternative possibilities, perspectives, and frames of action for art that explore the new conditions of digital systems as society-building forces and that develop from them new forms of intimacy*" [9]. Utilizing the ubiquitous digital infrastructures in public urban spaces has enticed artists to respond to the technical possibilities of electronic mapping and positioning technologies, as well as location-aware, networked media by exploring new forms of experience between the art object and the augmented urban environments that become possible through these technologies [13]. Locative media and art hold the potential to turn the urban fabric into a canvas that promises to open up a playground for probing into the

multiplicities and subjectivities of technologically mediated urban life in the 21st century [12]. In this sense, locative art resonates with Deleuze and Guattari's concept of *territory*, which posits a blurring of the distinction between the mapping of physical space and the production of an artistic or cultural milieu where the artist creates a new way of seeing and occupying the world [8].

With the continuous technological augmentation of everyday urban environments, the urban computing research paradigm (e.g. [17,20]) has by necessity widened its focus from the early utilitarian software models aimed at making cities run more efficiently and providing the local government with real-time sensor data to aid in decision making processes. The lack of holistic, sustainable, human-centered visions for "smart cities" created what Townsend has called an "enormous intellectual vacuum" [28]. Attempts to fill this vacuum often start by underlining very fundamental questions about the nature of public space and the role new technology plays in it (e.g. [19,31,32]). The role of the city and especially the role of public places have always been extremely diverse: it has been a market place, meeting place, and a place for play, art, performances, protests and communication. This diversity of functions should be taken as a starting point when designing new urban technologies.

Artistic, playful experiments using new technologies have highlighted the possibility of reshaping urban life and the structure of the city, leading to "contested-aware cities" [28] and an "aesthetic of the hyperreal" [9] where individuals may experience space and time in the physical environment in new ways and draw inspiration both from the artistic process as well as the final artistic outcome [21]. This leads to public urban spaces becoming what Sheridan *et al.* call *playful arenas*, where technologically mediated performances "meld atoms and bits, performer and audience, fantasy and fact to create an intimate connection between our physical and virtual world and to effectively augment our notion of expectation" [25].

Artists have a tradition of using the streets of cities as sites for rebellion against academicism and traditionalism, using happenings, performances, and Situationist city explorations as ways to create equality, exchange opinions, exercise creativity, and avoid having to follow the strict rules imposed by "formal" art outlets such as galleries and museums [9]. This "guerilla art" (cf. [2]), as exemplified by the works of well-known graffiti artists like Banksy, has also taken advantage of the proliferation of new technologies. For example, Scheible and Ojala [22] presented an interactive art tool *MobiSpray* for creating ubiquitous ephemeral digital art using a portable projector and a mobile phone as a "virtual spray can" for reimagining the physical environment in an ephemeral manner.

Similarly, public displays and projections have previously been used for various art projects. The *Manhattan Story Mashup* project [30] utilized a very large screen at Times Square in New York City to visualize interactive stories

captured by over 180 people using camera phones around Manhattan. *MobiToss* [23] allowed users to capture a photograph or video clip on their mobile phone and “throw” the resulting image or video, possibly augmented with additional items such as labels or music, to a nearby public display for others to view. The *e-Campus* display system was used for as a platform for an art project in an arts center in the UK. Here, three projected public displays showed news footage and radio broadcasts from the war time era, interspersed with images captured of objects placed on an interactive tablet and video diary entries [26].

An example of a media façade installation with both artistic and civic engagement purposes is *Mégaphone* [10], which was intended to act as a digital “speakers’ corner.” The system consisted of a public microphone on a stand with speech recognition, loudspeakers and two media façades. During the deployment, keywords were extracted from the speech and projected to the media façades. This way, people could both contribute to the system through the microphone, as well as consume media from the system through the loudspeakers, as well as the keywords from the media façades. Similarly, *Aarhus by Light* was an 180 square meter interactive media façade aimed at engaging local citizens in new kinds of public behavior in order to explore new possibilities of digital media in urban life [3].

As the discussed prototypes illustrate, new ubiquitous technology has garnered strong interest from the artistic community. However, many of these prototypes tend to be very ephemeral in nature, meaning that they are quite often one-off deployments where a single artist or collective showcases their work during an event or as a performance. Conversely, the design goal of StreetGallery has, from the start, been to create a lasting platform for digital arts in public urban space. To the best of our knowledge, StreetGallery is the longest running situated art platform utilizing interactive public displays in public urban spaces in the world. This places us in a unique position to discuss StreetGallery as an invaluable addition to the cultural milieu of Oulu, and its’ perceived value to the artists who have adopted the gallery as part of their creative process.

THE DISPLAY NETWORK

StreetGallery is provided to the artist community completely free of charge. It is made available to the public through a network of interactive public displays situated at central urban locations. At the time of writing there are 14 displays in the network. A display has a 57” or 65” high-definition LCD panel equipped with capacitive touch screen foil. Six outdoor displays and two indoor displays are two-sided, so altogether there are 22 LCD panels around the city. While the technical operation of the displays is out of the scope of this paper, we briefly introduce them to position the StreetGallery service as a part of the larger service offering.

The displays follow a simple interaction model transitioning between *idle*, *subtle* and *interactive* states. When a display is

idle, the whole screen real-estate is dedicated to a broadcast channel showing a playlist of both commercial and noncommercial content. *Subtle* state is triggered when the cameras embedded in the display enclosure detect a human face looking directly at the screen, at which point a ‘page ear’ animation is shown with an invitation to approach and touch the display. When a person touches the screen, the display transitions to *interactive* state where the broadcast channel is resized to the top left quarter of the screen. The broadcast channel is kept visible at all times to ensure contracted visibility to commercial customers, whose payments create revenue for covering the operational expenses of the displays.

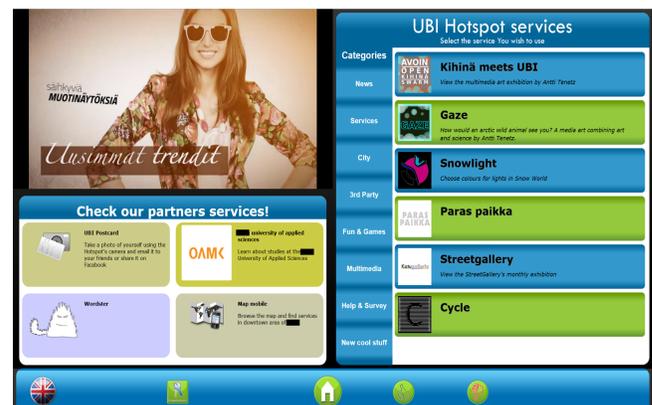


Figure 2. StreetGallery is found in the Multimedia category.

The right half of the screen is allocated for interactive services that are selectable through a categorized menu structure (Figure 2). At the time of writing, the displays offer 27 services in 8 categories, but the number of applications and categories has varied over the years. StreetGallery can be found in the ‘Multimedia’ category. The lower left quarter is allocated for a quick launch menu giving one click access to four services selected for promotion. StreetGallery was one of the promoted services from March 2014 until end of April 2015.

STREETGALLERY

When launched. StreetGallery occupies the right half of the screen. The artists are provided with a simple exhibition template specified by StreetGallery’s curator. The template specifies the basic structure of the exhibition as a cover image (Figure 4) followed by a sequence of actual exhibition images, together with simple navigation controls (previous/next image, start). The purpose of the template is to minimize the artist’s work in creating an exhibition and thus their need for any technical support from display owners and the curator. This simple exhibition template is fully customizable, however, and artists can “skin” the interface to suit their personal needs as they see fit. Of course, “skinning” the interface requires some web programming skills. Figure 3 shows an example of a “skinned” interface of an exhibition.

StreetGallery supports any media format or a mix of formats. The use of still images, video files, animation, audio, *etc.* is

left up to the artist compiling an exhibition. However, the use of audio is restricted on some displays located in places where it could be a disturbance, such as the main city library. Further, the ambient city noise from traffic, construction, *etc.* can make audio hard to hear in busy outdoor locations.



Figure 3. "Skinned" interface of an exhibition.

The curation of exhibitions is straightforward. Artists book an exhibition slot on StreetGallery in chronological order, and an exhibition slot typically covers one whole calendar month. However, some exceptions have been made at the request of artists who either want to display their works for a shorter period, or in case of sudden cancellations where the previous exhibition was extended. Due to high demand, individual artists have been limited to one exhibition per year. A couple of artists have returned for a second exhibition throughout the lifespan of StreetGallery. Finally, an exhibition has to fulfill simple quality requirements regarding content and functionality enforced by the curator.

StreetGallery has not been heavily promoted by the display owners, and acquiring new exhibitions has mainly relied on word-of-mouth amongst the local artist community. Soon after deployment in summer 2009, the main local newspaper included StreetGallery in its daily event calendar, and has published extensive articles of some exhibitions in its culture pages. Since the beginning of 2015, StreetGallery has had a dedicated companion website for browsing past exhibitions, as well as established a presence on popular social media platforms (Facebook, Twitter and Instagram). Main promotion for end users is shown on the displays, where StreetGallery has a continuously reserved spot in the playlist of the broadcast channel for showing an ad ("cover image") for the exhibition of the month (Figure 4), and the same ad is also distributed in social media. As mentioned earlier, StreetGallery was also included in the 'promoted

applications' section from 03/2014 until 04/2015. Artists can, of course, advertise their exhibitions in additional outlets should they so choose.



Figure 4. Examples of "cover images".

STREETGALLERY USAGE BY GENERAL PUBLIC

In this section we discuss StreetGallery usage on the displays. Data was collected from exhibition #1 starting on July 15, 2009 until the end of exhibition #66 in September 2015. This is an extensive data set containing real-world usage data from 75 months (~6 years) in authentic urban setting. During these years, new displays have been added to the network, malfunctioning or broken displays have been removed, and the locations of some displays have changed due to external conditions. For these reasons, we will not look at individual displays but rather focus on the display network as a whole.

During the 75 months of deployment, the StreetGallery application was launched altogether 18 598 times. Overall, each exhibition received on average 282 launches. The most successful exhibition (exhibition #1) received 1638 unique views, with exhibition #2 following closely with 1085 views. Of course, novelty effect can help explain these high numbers, as the display network was still very new and many people used them out of curiosity. Later on, view amounts settled around 200-300 views per exhibition, but with a lot of variation between exhibitions as expected. During the observed time period the number of total app launches (all available applications) across the displays was 636809. This means that StreetGallery was responsible for ~3% of total display usage. While this may seem modest, it should be pointed out that StreetGallery is just one among tens of services, and as an art application it is likely to appeal a

smaller subset of users when compared, for example, to games or news services. Figure 5 illustrates the total StreetGallery usage on the display network throughout the 75-month observation period.

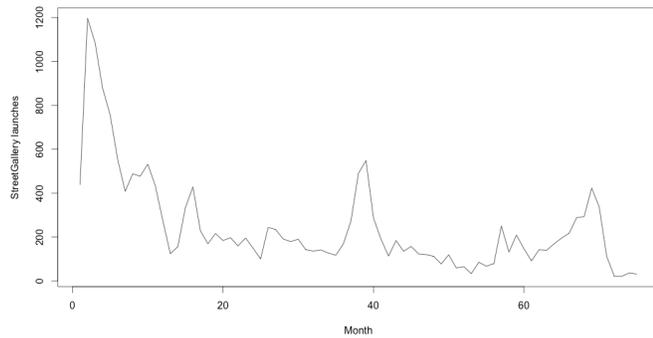


Figure 5. Monthly launches of StreetGallery on displays.

As seen in Figure 6, early exhibitions gathered a large number of viewers, likely due to novelty of the display network itself. As novelty effect receded, the audience reach per exhibition settled to a steady but smaller number. Most exhibitions were available for 1 calendar month, starting on the 1st of that month. However, there were some exceptions, with a few exhibitions lasting 1.5 or 2 calendar months.

The boxplot in Figure 7 shows the 66 exhibitions arranged chronologically, along with descriptive usage statistics normalized by dividing the total number of app launches with the number of StreetGallery launches as suggested in [19]. This provides a fairer comparison between exhibitions as it takes into account the overall usage of the display network and the fact that some exhibitions were available for more days.

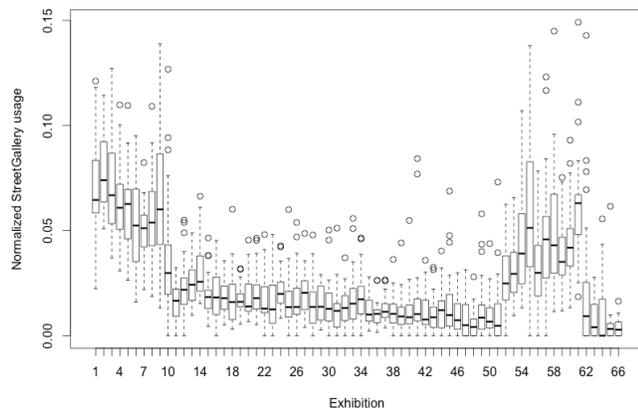


Figure 6. Boxplot of relative usage per exhibition

Beyond the previously mentioned novelty effect, when StreetGallery was included in the “promoted applications” section on the displays, relative usage spiked again (exhibitions 52 to 61). The “promoted applications” section has its own scheduler that places applications in rotation and we had little control over when StreetGallery would be promoted. During this time, likely due to higher visibility, StreetGallery had similar relative usage to the early

exhibitions. In summary, we present these results to showcase that the StreetGallery application was able to generate interest amongst the general public. However, the main focus of our analysis is on the artists’ creator-centric perspective reported in the following sections.

QUESTIONNAIRE STUDY

We designed a questionnaire to gauge the experiences and opinions of artists who had exhibited their works in StreetGallery. The online questionnaire, containing demographic information and 17 statements on a 5-point Likert scale was sent via email to all individual artists or contact persons of collectives. We received a total of 17 complete questionnaires (female N=9, male N=8). Respondents were asked to classify themselves as either ‘professional’ or ‘amateur’ artist. Four respondents classified themselves as amateurs, and the remaining 13 as professionals.

Statement	Mean all (SD)	Mean amateur (SD)	Mean pro (SD)
S1: Public urban spaces are well suited for exhibiting art	4.71 (.59)	4.75 (.5)	4.69 (.63)
S2: SG is a good way to bring art into public spaces	4.47 (.51)	4.50 (.57)	4.46 (.51)
S3: Using digital displays to bring art into public urban spaces helps advance the general public's familiarity with art	4.24 (.83)	4.25 (.96)	4.23 (.83)
S4: SG helps artists reach new audiences for their work	4.47 (.72)	4.50 (.58)	4.46 (.78)
S5: An exhibition in SG has the potential to reach a wider audience than an exhibition in a more traditional art gallery	3.53 (1.2)	4.25 (.96)	3.31 (1.18)
S6: An exhibition in SG has the potential to reach a wider audience than an online exhibition	2.76 (1.2)	2.75 (1.5)	2.77 (1.09)
S8: StreetGallery is a credible outlet for displaying art	3.29 (1.1)	4.00 (1.4)	3.08 (.95)
S15: The exhibition in StreetGallery is a valuable addition to my artist CV	3.12 (1.1)	2.50 (1.29)	3.31 (1.03)
S16: Having an exhibition in StreetGallery was overall a positive experience	4.47 (.62)	4.50 (.58)	4.46 (.66)

Table 1. Selected questionnaire statements and descriptive statistics

Table 1 shows selected questionnaire statements (translated into English) and basic descriptive statistics. The artists were generally positive regarding their experience in having an exhibition in StreetGallery, with statement S16 scoring an overall mean of 4.47. The artists also thought that public urban spaces are well suited for art (S1, M=4.71), that StreetGallery is a good way of bringing art into these spaces

(S2, M=4.47), and that utilizing the display network to showcase art is a good way of making the general public more knowledgeable about art (S3, M=4.24). Artists also agreed that StreetGallery helps artists reach new audiences for their work (S4, M=4.47). However, professionals and amateurs were split regarding statement S5, with amateurs being more positive about StreetGallery reaching a wider audience than an exhibition in a more traditional gallery (amateurs M=4.25, professionals M=3.31). Both agreed that online exhibitions on well-known art sites are likely to reach a wider audience than StreetGallery (S6, M=2.76). Amateurs felt more positive about StreetGallery as a credible outlet for art than professionals (S8, amateurs M=4.00, professionals M=3.08). Interestingly, however, professionals thought that an exhibition in StreetGallery was a more valuable addition to their CV (S15, amateurs M=2.50, professionals M=3.31). When asked whether the artists would be ready to do another exhibition in StreetGallery, 12 (70%) responded yes, none responded no, and 5 (30%) answered “Don’t know”.

The questionnaire also contained 5 free-text questions (questions and quotes all translated into English): **Q1:** Describe a typical StreetGallery user; **Q2:** For whom and for what purpose do you think StreetGallery is meant for?; **Q3:** What are StreetGallery’s main strengths and weaknesses? **Q4:** How could StreetGallery be improved?; **Q5:** What motivated you to do an exhibition in StreetGallery in the first place? Regarding Q1, the artists described their envisioned end-user as young, interested in new technology, interested in art, and with time to kill while hanging out at downtown. “Probably an artist or an arts student, someone who goes to art exhibitions and is interested in culture. Maybe some friends or random people who are motivated to have a look by this person”. (R4). “Either a tourist or a teenager killing time... Or a resident with spare time” (R6). “Young, curious, with good technical skills who isn’t scared to touch a digital screen” (R9). These views are probably connected to the design of display devices; in a previous study mapping the perspectives of the experts responsible for the design, the typical user was depicted in the same way. Thus, the displays are designed in a way that makes them attractive especially for young, tech-savvy residents [27].

As for Q2, artists mainly agreed that StreetGallery is for bringing fresh new art into sometimes bleak urban spaces, and is meant for a very heterogeneous group of people. “Perhaps [StreetGallery] can bring a smidgen of beauty, or something unfamiliar, to the urban environment, which isn’t necessarily that beautiful” (R2). “I think StreetGallery is meant for a very wide group of people, regardless of age or gender!” (R6). “[It is] meant for making art visible for everyone. [StreetGallery] might not attract “big names”, but this can be an advantage in that it helps bring out fresh new talent.” (R8).

Question 3 probed the central strengths and weaknesses of StreetGallery. The artists were eager at pointing out the positive qualities of the service, such as low cost, potentially

high visibility and the ability to reach new audiences: “This is a great project and one that I hope will continue on for a long time. [StreetGallery] gives everyone a chance to showcase their work for a long period (1 month)” (R11). They also identified central weaknesses that mainly related to the display devices and not necessarily directly to the StreetGallery application, such as intermittent technical failures of the displays. Furthermore, difficulties the artists identified included viewing outdoor screens in challenging and changing arctic conditions: “Outdoor displays are challenging because they’re difficult to view in direct sunlight during the summer and also unpleasant to use in cold temperatures during winters” (R6). Furthermore, the fact that the entire screen could not be dedicated to StreetGallery due to the aforementioned requirement to keep the broadcast channel visible at all times was considered a weakness by many: “Also the ½ screen makes the art seem small” (R6).

The survey data did not reveal many concrete ideas for how to improve StreetGallery (Q4). Most respondents again focused on the display devices and not the service itself. They hoped the service would be easier to find and suggested it could have more information on the artist such as interviews. Some suggestions revolved around increasing the reciprocity of the service and enhancing the viewing experience: “Some kind of guestbook functionality, benches in front of the displays” (R3). “Showing videos with audio would take the experience to another level” (R9).

Finally, the artists mainly named simplicity, low cost, wide audience reach, and egalitarian access to art as their main motivations for doing an exhibition in StreetGallery (Q5). Doing an exhibition was considered very easy and the low cost was valued high as usually exhibitions in galleries are very expensive for the artist: “Setting up the exhibition was made very easy, unlike the huge hassle in art galleries” (R12). Furthermore, the egalitarian access to art was mentioned several times: “I like the idea that art comes to regular people and is not hidden away in a gallery or something, somewhere you have to explicitly go. Because only people who are already interested in art do this, I think” (R2). “On the displays art is available for everyone, even people who don’t visit art galleries” (R3). In addition, StreetGallery is available for both amateurs and professional artists - in other words, the artist does not have to be famous to do an exhibition. This was also considered as an advantage of the service: “This was my first exhibition, and StreetGallery seemed like an easy place to start” (R8).

SEMI-STRUCTURED INTERVIEWS

The semi-structured theme interviews were conducted in 2014 with eight artists (3 female) who also had participated in the survey. Five of the interviewees can be classified as professional artists and three as amateurs. They had exhibited their artworks in Street gallery between the years 2010-2014. The aim of these interviews was to gain more in-depth understanding on artists’ experiences and perceptions

concerning StreetGallery and also more broadly, on the possibilities of digital public art. All interviews were recorded and transcribed. Analysis of the interview material is based on iterative readings, including the classifying, systemizing, and structuring of the data into emerging themes. Organizing the material enables the comparison of participant perspectives and the discovery of common themes and meanings the interviewed artists assign to this new, very public outlet for their work [4,7]. The aim has been to understand the phenomena both as lived experience and as a part of larger socio-cultural frames, an approach typical, for example, to cultural anthropology [11].

The artists had slightly differing perceptions about the purpose of their exhibition in StreetGallery. These can be divided in two main themes: 1) *marketing their art* and/or 2) *providing an experience through their art*. For some, especially professional artists, StreetGallery was mainly a marketing channel. They wanted more visibility for their work; one participant, for example, stated that he wanted to “*showcase his exhibition in every possible way*”. These perceptions can be seen as connected to the commercialization of urban public space. Its role as a stage for commercial interests is nowadays emphasized (e.g. [33]) and artists need to market and sell their artworks as well. They thought that the added visibility of art can make people more interested in their work, and potentially also convince them to visit ‘traditional galleries’. Others stated that the exhibition in StreetGallery was not for marketing purposes only, but to provide an “*exceptional experience*”, or to “*tell a story*”. These latter accounts are aligned with the previously presented ideas on how new forms of digital art can reshape public space [9,21]. One of the artists envisioned how the sounds of the streets and changing lighting conditions make seeing the exhibition a unique experience, tied to surrounding conditions; work of art becomes entangled with the environment.

The interviewed artists appeared to have some conflicting opinions about StreetGallery. On one hand, they highlighted its positive features and especially appreciated the fact that it is *easily accessible* for everybody – both for artists and city residents. This theme also came up in the survey analyzed in the previous section. The artists emphasized the difficulties and constraints of doing an exhibition in a ‘traditional’ art gallery. It was described as costly, burdensome and requiring loads of organizing. One interviewee described it as a “*really infuriating and irritating necessity*”. In addition, recognized galleries will not easily allow newcomers – or even established artists – to display their works. Art galleries were also considered quite elitist in the sense that only certain kind of people visit them; one participant, a professional artist, summarized that “*only my relatives and people who are forced to do so will visit the ‘real’ gallery*”. Furthermore, in Finland the artist usually pays the gallery a fee for each exhibition; this peculiar practice results in the artist bearing the financial risk alone [1]. In many other countries, where art markets are bigger, the gallery and the artist usually split

the retail sale price of a work of art. For example, one artist commented that “*I was really surprised I was allowed to use public space for free, and for exhibiting my personal artworks*”. Thus, *the openness* of StreetGallery was valued very high.

On the other hand, the artists felt that all the potential StreetGallery encompasses as a completely public, digital and interactive medium was not fully utilized. Compared to the survey, the interviewed artists presented more detailed critique. All of them mentioned that the *size of the images was small*. Some of the more marketing-oriented artists were not as displeased about this, as they thought any and all visibility is good. Some were more disappointed and wondered whether they had had too high expectations about the exhibition in the first place. They stated the size of the images made the exhibition seem quite modest. Almost all of them had expected some *feedback* from the audience, and the lack of it made them wonder if anybody even saw their artwork. Many artists also considered their exhibition as *difficult to find* because the displays offer many different services in multiple categories.

The interviewed artists’ ideas for how to improve StreetGallery revolved around these aspects. All of them supported the idea of larger screen real estate, preferably so that the art pieces would cover the entire screen. They also discussed more sophisticated interaction techniques such as enabling zooming or rotating the pictures. Compared to ‘traditional exhibitions’, these would make the exhibition more special and emphasize its interactive and digital nature (cf. [9]). Of course, all these features could be made available by the artists themselves, as all exhibitions are fully customizable. However, the interviews showed that this option was not very clearly communicated to the artists, or they lacked the technical skills to implement such features themselves. The artists also hoped that StreetGallery would be marketed more by the service administrators to attract higher numbers of visitors. In summary, the artists appreciated the idea of StreetGallery, but thought it could be “so much more”.

Finally, artists were asked to discuss ideas and visions they have about the intersection of art, digital technologies and public spaces in general. The two themes that arose from this were related to general desire for more art in public spaces, in every form, and the high potential of digital technologies to provide cost-efficient ways to create impressive public art. Artists felt that the combination of public urban spaces and emerging digital technologies can free art from the traditional restrictions imposed by walls, frames, or galleries. To this end, artists often brought up the potential of large-scale projections as a great way of showcasing art in an ephemeral and low-cost manner. Large size was again considered as a central facet of digital public art because material costs do not restrict the size of projections. Two of the interviewed artists had, after StreetGallery, showcased their art in a large-size digital screen (5.1 x 3.2 meters)

owned by commercial actors and installed recently at the city center of Oulu; third artist said she would have wanted to have an exhibition on large digital billboards outside city center. From this we can conclude that size is a fundamental topic as digital technologies offer an easy way to make art respond or resonate with the scale of the built environment – with buildings, bridges and other structures of the city. Digital public art can also be seen as an alternative for omnipresent digital advertisements that visually dominate the city space.

DISCUSSION

StreetGallery was designed as an enduring artifact that can help blur the distinction between the contemporary mapping of public urban space as a site for mainly commerce and transit, and that of ephemeral art and beauty. Digital urban screens and media façades, which have become pervasive in modern cities, can be seen as belonging to the aesthetic continuum formed, for example, by architectural ornament and cathedrals with their colorful glass windows [15]. StreetGallery follows this age-old tradition and practice of bringing art and beauty to urban public places by providing the local artist community with a highly visible and egalitarian outlet for showcasing their works outside the confines of traditional art galleries, thus fusing the concept of art gallery with public urban space and new ubiquitous technology. Utilizing these emerging urban technologies also for aesthetic and artistic endeavors is important, as commercial functions of public urban space and its visual elements are strongly emphasized in modern cities. The goal of StreetGallery is to add diversity and highlight other possible functions of urban spaces and places by creating an enduring platform for arts by utilizing the new highly visible technological component introduced into the cityscape, *i.e.* the network of large, interactive public displays.

The central aim of this paper was to explore StreetGallery from the *creator-centric* perspective. For this purpose, we conducted a survey study and in-depth interviews with the goal of understanding the experience of the artists who had utilized StreetGallery to exhibit their art. Analysis of the interviews was based on the notion that artists' views are shaped by their personal lifeworld and shared socio-cultural frames. Socio-cultural frames refer here to “shared webs of significance” which make peoples' actions meaningful; thus, in order to understand an experience or an action, it must be contextualized [11]. Results from the analysis indicate that in order to understand artists' perspectives concerning StreetGallery, their experiences must be situated within the following frameworks: 1) *gallery practices/visual art markets in Finland* and 2) *the street/city understood as a commercial public space*. We explore these frameworks and StreetGallery's relationship with them below. Furthermore, we will discuss how StreetGallery could potentially reform these frameworks.

StreetGallery as a “Breath of Fresh Air”

Analysis of the interview data showed that artists tend to conceptualize StreetGallery as something of an exception to the current field of art galleries and gallery practices. Within the confines of contemporary art institution, galleries are still firmly positioned as central stages for artists to gain visibility and publicity, and to sell their work. In order to build a career as a professional (or as a recognized amateur), an artist simply must exhibit his/her work. The interplay between artists and galleries has been explored in literature, and often practices in this field differ based on national context [16]. Jyrämä and Äyväre [16] approach the current visual art market from the perspective of a network structure, and summarize the roles of the artists and galleries in the following way: *The artist is the provider of products, and, in a way, the heart of the activities. The main task of the gallery manager [...] is to bring together the buyers and the artists or artworks. The gallery also engages in legitimizing its artists through relationships with institutional actors such as museums and art critics and by building artists' careers through relationships with other galleries.*

The artists who either responded to the questionnaire or were interviewed all agreed that the display network provides a compelling way of bringing art out of the ‘traditional’ galleries, which were seen as ‘elitist’ or ‘unapproachable’, and into the streets where people are given a very egalitarian access to art regardless of social or economic status. Further, having an exhibition in StreetGallery can help artists reach new audiences for their work and make the general public more knowledgeable about art overall. This, in turn, can help mitigate the rather difficult situation most artists find themselves in: according to recent study [5], artists in Finland have less income than their colleagues in neighboring countries, and the grant system is generally weaker. The limited income, combined with local gallery practices (high gallery rent), places artists in a more precarious position than in many other countries. The fact that exhibitions in StreetGallery are completely free of charge for both the artist and the audience was frequently brought up as a highly positive aspect in both the questionnaire study and in the interviews. Overall, StreetGallery was considered as an important platform and a fresh way to exhibit art and reach new audiences.

Art galleries and other outlets for visual art are also hierarchically structured according to their (perceived) reputation and status. This system creates such groupings as *elite galleries*, *quality galleries*, and *other galleries*. Gallery's reputation and perceived legitimization is linked to whether other actors consider it “serious”, as *making a contribution to the advancement of art* [16]. Within this classification, StreetGallery was clearly seen as *other gallery*, and it was relatively unknown among artists. All artists participating in the study expressed hopes that StreetGallery would be marketed more to potentially increase its standing, and in the questionnaire study amateur artists had the tendency to view StreetGallery as more

credible than professionals. This goes to show that artists who have already established themselves as professionals in the field still regard art galleries as the main outlet for their art. Some artists, however, were clearly against the prevailing gallery system and especially they found StreetGallery to be like a breath of fresh air and almost a form of rebellion against existing structures that were seen as constricting.

Arts and the Commercial City

Contemporary city entails a variety of meanings and acts as a stage for differing actions, but arguably one of the strongest urban paradigms is consumerism [6]. Zukin defines cities as “landscapes of consumption” [33]; urban consumerism is connected to consumer goods such as clothes but also to leisure, travel and culture. Towards this end, contemporary cities are visually dominated by advertisements that are increasingly digital – screens, billboards and projections are substituting more traditional signage such as printed posters or billboards. Perhaps not surprisingly, then, some of the interviewed artists framed their exhibition in StreetGallery as marketing. Their main motivation for doing an exhibition was to gain increased visibility for their work, similarly to other providers of products who use the urban public space and its digital platforms for marketing purposes. However, other artists did not view StreetGallery as a marketing tool but as a platform for telling stories and providing new experiences. Of course, these views are not in contradiction with one another. StreetGallery as a platform can be seen as a bridge between advertising and art, and people and the artist. The same can of course be said about traditional art galleries as well, but as the interviewed artists noted, StreetGallery has the potential to reach audiences who do not normally visit galleries or actively seek out art to consume.

On the other hand, advertisement and art are also competing for space and visibility in urban space. Interestingly, this struggle was manifested in the actual design of the StreetGallery interface: Due to the contractual issues with the advertisers, the interface is shown only on the right half of the screen. The fact that only part of the display was reserved for the artworks was a disappointment for many artists who hoped their exhibition would be as impressive as possible. However, utilizing the entire visual capacity of the displays for showing art might carry certain unexpected connotations. Previous studies have indicated that people find using large public display distressing if the display in question showcases ads that people do not want to become associated with.

In a study by Ylipulli et al. [32] city residents likened using a public display to a public performance and the screen’s visible content was seen as affecting their public image. This performative perspective opens up interesting new questions concerning StreetGallery: how would users experience browsing very large artworks? This question could be explored in the future in a study focusing on experiences of the StreetGallery users. Similarly, the given exhibition

template proved to be something of a double edged sword. While artists appreciated the low-barrier nature and ease of deployment provided by the template, they also felt restricted by it. Even though the option to “skin” and design exhibitions in whichever way they wanted was always available, it was perhaps not advertised enough to the artists as only a few took advantage of this possibility. On the other hand, from the gallery’s curation point of view, managing custom exhibitions requires more effort than exhibitions that follow the given template. A clear future direction is to find a middle ground between customization and basic functionality.

LESSONS LEARNED

Here, we will attempt to summarize main lessons learned and challenges derived from the longitudinal deployment of StreetGallery on a network of interactive public displays, and the results from the study presented in this paper.

A crowded ecosystem makes art installations difficult. As the public displays host a large number of applications, all available through a menu structure, simply finding the StreetGallery service becomes a challenge. The problems related to multi-application ecosystems on public displays have been discussed previously in e.g. [14,18] and similarly to findings in these papers, we found that placing the service in a shortcut menu dramatically increased its popularity. Further, having a reserved slot in the broadcast channel for showing the cover image of the current exhibition helped publicize the service to an extent. From an artist’s point of view, of course, having to ‘hide’ StreetGallery in a menu is far from optimal, and all interviewed artists expressed hopes that the service could be made more visible. Further, the requirement to have the broadcast channel visible at all times was perceived as limiting, as artists would naturally want their works to be displayed on the entire screen. From a design perspective, utilizing dedicated displays for art-related applications would of course be ideal. However, with multi-purpose displays designing for application discoverability becomes key, and implementing advertisement schemes that allow for full-screen content should be explored.

Providing an exhibition template is a double-edged sword. The simple template provided to artists for creating slideshow –type exhibitions was perceived to work well in lowering the barrier for entry and making the platform available also to artists with limited technical skills. On the other hand, the template can encourage artists to rely on the template instead of creating their own personalized exhibitions. Even though the option to use mixed media and to create custom skinned exhibitions was always available, very few artists actually took advantage of this. An editor software that would allow artists to create customized exhibitions, perhaps with several ready-made templates to choose from, would likely encourage more artists to personalize their exhibitions and allow them to better take

advantage of the various capabilities provided by new technology.

Public art galleries can be liberating, but they are not necessarily perceived as ‘serious’ outlets for art. The interview study highlighted tensions between artists and the established system of museums and art galleries. Artists were frustrated with the bureaucracy and financial risk required to showcase their works in galleries. Therefore, the open and free nature of StreetGallery was very welcome to them. Some artists likened StreetGallery to a breath of fresh air, and saw it almost as a form of rebellion against the prevailing system. Professional artists, who had a long history of exhibiting their works in galleries, however, still tended to view StreetGallery as more of a promotional tool than a credible gallery in itself. One possible way of increasing the reputation of these kinds of non-traditional galleries would be to run special exhibitions by well-known artists from time to time, who could also be compensated for their effort. This would, of course, require recruiting such artists and convincing them to create an exhibition using the platform. On the other hand, however, providing this kind of preferential treatment to some could also damage the gallery’s reputation as democratic, free-of-charge, and open to everyone. These qualities were often highlighted by the study participants as some of the most positive aspects of the service.

Tailoring art according to context was not utilized. The large network of public displays situated in various urban spaces and places would enable artists to tailor their exhibitions to take advantage of the unique context of each display. However, no artists have taken advantage of this possibility. Even though some interviewed artists talked about creating unique experiences through the interplay of art and the surrounding urban space, in practice this was not implemented in the exhibitions. This might be due to the sheer number of displays available in the network: manually creating over a dozen unique exhibitions, tailored to take advantage of each display’s context, is a lot of work. This is something that could be addressed in the editor tool discussed previously: if the tool provided an option to create various versions of the exhibition, and let the user decide which version is available where, then perhaps more artists would take advantage of this functionality. This would also provide the viewers with a much richer experience, as they could go from display to display and experience the art in a unique way at each location.

CONCLUSIONS AND FUTURE WORK

StreetGallery and other similar platforms contain the potential to challenge traditional paradigms of art gallery practices. New technologies embedded into our everyday lived environments can help transform the perception of public urban space as a stage for consumption and commerce. StreetGallery provides artists with an alternate, highly public and open space to exhibit their work and by doing so, to also tell stories and provide new, unique

experiences. This was brought up in the interviews, where artists highlighted StreetGallery’s potential to provide an “*exceptional experience*”, or to “*tell a story*”, by *e.g.* using the changing urban auditory landscape and street illumination to create a moment in time that interplays with the artwork on the screen and creates a fleeting experience, as envisioned by one artist. In this way, StreetGallery can also emphasize playful and imaginative elements of urban environments. However, given the intensive amount of work required to tailor exhibitions to each display, artists have not yet taken advantage of the option.

Artists contributing to this study offered valuable feedback on how the service could be improved to fully utilize StreetGallery’s potential. These ideas included, for example, more sophisticated interaction techniques and feedback mechanism to make the exhibition more reciprocal. While the option to “skin” exhibitions and implement any type of interaction mechanism exists, the artists were either not fully aware of this possibility or did not fully comprehend the possibilities awarded by customization. For this reason, we have begun work on providing a more intuitive WYSIWYG editor that the artists can utilize while planning and designing their exhibition in collaboration with the StreetGallery administrators. Further, artists commented that StreetGallery should be easier to find in the menu structure of the displays. In a crowded ecosystem with multiple apps competing for the user’s attention, simply promoting one app over the others is not feasible. To address this shortcoming, we are currently in the process of increasing StreetGallery’s visibility on online social and local media platforms. Finally, several artists requested a feature that would allow them to include a longer biography and other personal information. This feature has already been implemented and the StreetGallery interface now contains a dedicated area for this information. Finally, we are also planning to investigate citizen’s perspective of these types of open, public and free art galleries.

Limitations

We acknowledge that the number of artists who participated in both the questionnaire study and the interviews is relatively low, given the overall high number of exhibitions hosted in StreetGallery over the years. Further, we acknowledge that collecting data from the artists at only one point in time during the deployment is not ideal. However, we have shared the results of this study with the curators and have agreed to help develop the next iteration of the service with features discussed previously.

ACKNOWLEDGEMENTS

This work has been supported by the UBI HIB project (268397) funded by the Academy of Finland, and the Open Innovation Platform of Six City Strategy project (A70202) funded by the ERDF and the City of Oulu.

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