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## Conference Workshop Proceedings

### Public and Situated Displays to Support Communities

Workshop held in conjunction with OZCHI 2008

9th December 2008, Cairns, Queensland, Australia

#### Workshop website

<http://wraydisplay.lancs.ac.uk/ozchi08/>

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- Christine Satchell, Queensland University of Technology, Australia
- Marcus Foth, Queensland University of Technology
- Ian MacColl, ACID and Queensland University of Technology, Australia

#### Accepted papers

- Display of Play. Michael Arnold
- The College Room as a Display Case. Michael Arnold and Catherine Howell
- Mud, Mobiles and a Large Interactive Display. Paul Coulton, Will Bamford and Reuben Edwards
- Media Façades Beyond Interaction. Peter Dalsgaard and Jonas Fritsch
- Situated Engagement at a Public Urban Display. Ann Morrison and Antti Salovaara
- Social Incentive & Eco-Visualization Displays: Toward Persuading Greater Change in Dormitory Communities. William Odom, James Pierce and David Roedl
- Nnub: A Display for Local Communications. Fiona Redhead and Margot Brereton
- Exploring the Use of Non-Digital Situated Displays in a Rural Community. Nick Taylor and Keith Cheverst
- Exploring the Display in Disaster Recovery. Connor Graham, Vincent O'Brien and Mark Rouncefield

# The Display of Play

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## ABSTRACT

In this contribution I propose that public displays to support community do not necessarily have to carry art, entertainment, sports, news, advertising, private communications, historical content, public interest information, community news, educational material, and other content that might be described as self-consciously worthy, but instead, might enable people to play with one another.

Three systems that support the display of co-operative play are described, and their features are compared. Two of these have been installed whilst the other is a proposal in search of funds.

## Categories and Subject Descriptors

H5.m. Information interfaces and presentation.

## General Terms

Human Factors.

## Keywords

Public screens, Public sphere, Communications Technology.

## 1. INTRODUCTION

Public displays that intend to lend support to community are sometimes earnest, even to the point of being po-faced. Monuments are an ancient form of community display, and almost every town in Australia boasts a bronze statue of a soldier standing atop a generally long list of the slain; almost every town and most suburbs display statues of dead councillors, their stern expressions reminding us that they were servants of the community.

Other public displays go more to community status than community spirit, and are sometimes imposing, to the point of being pretentious. Every city needs a public icon. Many new green-field and high-rise developments boast grandiose fountains, baroque entrance gates, expansive marble, and other monumental displays of community's exclusivity and sense of self worth.

Many public displays that intend to serve the community are

instrumental, and are more mundane than monumental. Noticeboards advertising items for private sale, jobs vacant in local businesses, handyman services, or player selection for the local team, may be seen in butcher shop windows, libraries, town halls and supermarkets, and serve to remind the locals that they are interconnected.

Educative displays are also popular. Centenaries, bi-centenaries and the like, are occasions to display historical photographs and documents in the library or town hall, and many communities have permanent displays of historical material. Many country towns and city parks display features of the local flora, fauna and geology, and each summer requires educative displays of fire-hazard conditions, water conservation techniques and other useful advice.

Public art has long been a popular way to provide a focal-point for community identity and spirit, though the choice of particular works is invariably controversial. Big objects are popular icons in some communities (Woombye's Big-pineapple, Gippsland's Big-worm), whereas other communities go for more high-brow sculptural pieces, work that invokes an indigenous heritage, or work that uses sculptural form to gesture to some notable characteristic of its locale.

A much more recent media-form is the 'urban screen' – a very large bill-board installation capable of displaying moving, high-resolution, full-colour images in daylight and at night time, using LED or LAMP technologies. Though typically used for advertising, they are also employed to broadcast sporting events, cultural activities, digital artworks, and public interest information, and are popular focal points for public events.

The contemporary move that is the subject of this workshop, the move to design and build public displays to serve local communities, also makes use of digital technologies (in the main), but as one might expect, these displays are much more local and situated in their *raison-d'être* and their reach than their big brothers in city centres. They typically rely on locals to provide content, and often entail a degree of interactivity. In other respects though, digital community displays draw upon traditional themes, and provide for content that is variously earnest, historical, instrumental, educative, artistic, or commercial.

By way of an alternative, the projects discussed in this paper suggest that public displays to support community be built around cooperative play.

## 2. PUBLIC DISPLAYS OF PLAY

### 2.1 Body Movies

Rafael Lozano-Hemmer's Body Movies is a performance art installation where the public are the performers as well as the

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viewers, and play is the object. The installation consists of a) a very large prepared wall in a public place, b) very bright spot-lights, and c) a series of projected images of local people. As Lozano-Hemmer envisaged the installation, the projected portraits would be washed out by the bright spot-lights until revealed by the shadows of passers by. The performance of the public was thus thought to be concerned with the revelation of the portraits of local people. But the more interesting aspect of the installation in action had little to do with revealing portraits, and a lot to do with spontaneous and cooperative shadow-play that the public was moved to engage in among themselves. The shadows cast by the spot-lights vary in size from 2 to 30 meters – depending on the person’s distance from the wall – and up to 50 or so people are able to play with their shadows collectively and individually.



**Figure 1. Lozano-Hemmer’s Body Movies. (Sourced from Google Images)**

Shadow puppet ‘giants’ play with shadow puppet ‘dolls’; shadow animals chase one another, and so on. People in public places, who may well be strangers to one another, are relating to one another in ways that are both playful and considered, and people are aware of themselves as a cooperative, as well as their embodied individuality.

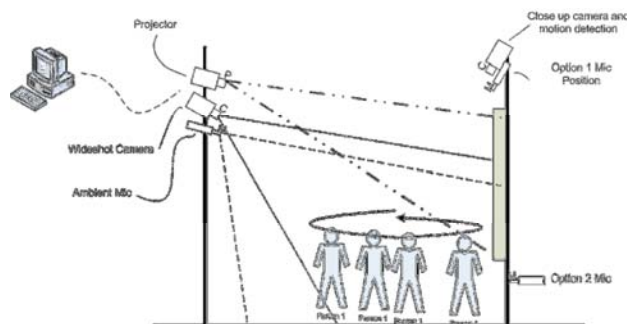
## 2.2 Street-life Portals

Street life portals are intended to create an “always on”, real-time visual and aural connection between one public place and another, through which individuals and the publics of each place may observe, communicate, play, and perform, with one another, and for one another.

This unfunded project proposes to place a relatively simple communications system in laneways or streets of paired towns, and simply leaves the portals in public hands for whatever performances that arise. It is thus pretty much a *tabula rasa*, or contentless infrastructure, and its usefulness and point of being are not entirely clear (which may be why it hasn’t attracted funding!). Nevertheless, a number of modes of operation and the performances mediated by those modes, are easy to envisage.

In one-on-one mode, spontaneous and playful use of the portal is triggered when a person happens to occupy a ‘hot-spot’ in say, Melbourne, and a person also occupies a hot-spot in say, Tianjin. Me, a person who just happens to be standing in the hot-spot in Melbourne, will see the image of You, a stranger

from another place, in my space. The situation is of course mirrored in Tianjin. You and Me may well wave to each other, blow a kiss, mirror- dance, make a rude gesture, or try to strike up a conversation. If the hotspots are not occupied, the portal may cut to a second mode of operation. In this second mode, the camera and microphones focus on a broader area of the street – say 10m-15m in length, perhaps marked out on the ground by inlaid brass strips, and at night, by lighting. Or perhaps not. In this mode the portal takes in whole numbers of people as they go about their daily business, and displays this 10-15m streetscape on a prepared wall in another city on a one-to-one scale, in real time. ‘Here’ and ‘There’ are made to coexist, and what makes here and there peculiar is evident. The situated sights and sounds of daily life in the street, in this place and that place, in this community and that community, are captured and communicated as life occurs within the focal area.



**Figure 2. The Street-life Portal. Illustration by Peter Benda.**

Half-whacked people may well emerge from city clubs, pubs and bars and make their way to a portal for a bit of crude banter. Some people will go out of their way to be racially abusive, and “flashers” may well be attracted to the potential of an international audience. But such is the nature of play in the public sphere, and such is the nature of the public, and it is in our interests that risks be taken and these spheres exist, and whilst the ordinary law of the land constrains people’s behaviour on the street in the usual way, the portal itself offers no further constraint. But on second thoughts, it may not be enough to provide a camera, a microphone and a screen to communicate with, without also providing something to communicate about. To further stimulate play, it might be fun to augment the system with say, a ‘virtual balloon’ sitting in the corner of the screen. We might use an arm-motion to hit the virtual balloon into the air, and might set about cooperating to keep it in the air. We have something between us to play with and to communicate about. Interactive game designers will no doubt come up with all sorts of hijinks when given large format live images, motion-sense cameras, internet connections, computers, and 50 or more participants on each side of the world.

An important point about this play is that it is a public display. In the street we are watching people communicating, watching people watching people, and watching people watching people communicating. Personal co-presence simultaneously creates co-present publics who are drawn to witnessing the live action and at the same time the screen action. The portal’s work in the simultaneous construction of multiple parallel publics, some here, some there, some watching the screen and others watching the players, provides a potentially rich field for the construction of a public that is known to itself as a public – as a collective

that recognises the points of difference between this place and that place, between Self and the Other, through being connected to the Other, for no particular reason.

### 2.3 The Telectroscope

The Telectroscope is a portal that was installed between London's South Bank and Brooklyn, New York, and was in use from late May to early June 2008. The installation was designed by the artist Paul St George and was sponsored by Tiscali, a British telecommunications company. The conceptual and physical 'framing' of the Telectroscope is very appealing. The story is told of Paul St George's inheritance of a long forgotten 19<sup>th</sup> century tunnel that was dug under the Atlantic through the Earth's crust by his Great Grandfather, Alexander Stanhope St George, inventor of the Telectroscope. Through the cunning placement of mirrors through the tunnel, Alexander enabled the people of New York and the people of London to see and hear one another, predating teleconferencing by more than a century! The story is well reinforced by the physical framing of the portal - a well constructed Jules Vern like device that marks the tunnel mouth and frames the screens physically and as a narrative.

People were charged one Pound to use "the tunnel" for a minute or so, and waited in the queue for over an hour to do so. According to the attendant this is typical, and many people did not doubt the truth of the story of the tunnel under the Atlantic. Their use of the tunnel was pointless, and as anticipated by the street-life portal project - people were pleased to wave to each other, blow a kiss, mirror-dance, make rude gestures, and try to strike up a conversation.



Figure 3. The Telectroscope, London. (Photograph by the author.)

My own attitude to framing the performance of the system in this way is ambivalent. The tunnel story is very appealing, and the fact that many people are prepared to believe it, or suspend disbelief, attests to its appeal. The physical construction is artful, and suits the narrative very well. On the other hand, the fact that the action is framed at all removes it from the streetscape and contextualises it as something different - in this

case, a commercial, retro-sci-fi entertainment. (Many sculptors have a similarly antagonistic attitude to the plinth - a structure that frames the sculpture and thus decontextualises it and marks it as alien). Rather than allowing 'there' to be a part of 'here', the Telectroscope's elaborate framing removes and separates the play from the street, and deliberately contextualises it as unordinary. To hear the story of this heroic Victorian-era engineering, to see the magnificent brass and iron tunnel mouth, to queue for the system, to pay to use the system, to be positioned in front of the frame for a defined period, all situates the experience as a self-conscious entertainment rather than a part of daily life in the community, on the street.

### 3. CONCLUSION

Body Movies and the Telectroscope draw attention to the sociotechnical machinery and performance as an artistic or entertainment artefact, and as an event. The Street-life Portal project is less interventionist in so much as, for the most part, it simply transmits sound and vision in a straightforward way, projected against a wall as an integral part of the streetscape. This minimalist approach seeks to hide the technological component of the sociotechnical, and focuses on the social interaction, the display of play, facilitated by unadorned image and sound, contextualised only by the local streetscape, not by a frame and a narrative that sets it apart.

Clearly though, all three concepts share important concerns. They are all concerned with play, spontaneity and improvisation as a means by which people might interact. They are all concerned to encourage interaction among strangers. They are all concerned to create a local spectacle and thus a local public. They are all concerned with public interaction and performance in public places that invigorate these public places. In these ways they all propose to use contemporary technologies to create displays in support of local community.

The catalyst is the simple presence of the public per se, the street, the crowd, the life, and the public interest is in one another - in the personal co-presence of 'You and Me', and a public co-presence of 'Others', and not in contrived content that delivers a public.

Public displays of play can and should take their place as common public infrastructure, and as public infrastructure they open up a new aspects of the public sphere to be put to whatever purpose the public desires, as an open-access, un-moderated channel of playful, personal, social and cultural exchange between communities, publics and peoples.

### 4. ACKNOWLEDGMENTS

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# The College Room as a Display Case

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## ABSTRACT

For the purposes of this paper the student room is read as a 'display case' for the presentation of the student's identity and lifeworld. Our method for examining the display is described, observations of the display are made and discussed, and implications for other displays are made clear.

## Categories and Subject Descriptors

H5.m. Information interfaces and presentation.

## General Terms

Human Factors.

## Keywords

Display, public display, student rooms.

## 1. INTRODUCTION

In some ways the typical student room in a University hall of residence or College is a strange place to live. The room's most notable point of difference is that it is an undifferentiated, multi-purpose space, not coincidentally like the monastic cell, the prison cell, or perhaps the single room European home of the middle ages, where the student works, sleeps, eats, hosts intimate friends, entertains visitors, seeks privacy and enjoys solitude. A second, related point of difference, is that the student room is both a private place (a bedroom and a study), and a social place (for receiving guests). The objects that occupy the room thus support both the private life and the social life of the student.

It is not surprising then that the typical student room is cluttered with objects, many of which are on display, some purposefully so (e.g. a poster), and others displayed in so far as they are made to be ready to hand for whatever function they perform (e.g. an open book). Like the room itself, this display serves both the private life and the social life of the student.

The display does so in two ways. Firstly, displayed items provide semiotic points of self-reference that are ontological markers of identity, for constructing oneself and recognising oneself. They thus serve a private function—"This is me". Secondly, these markers are also recognizable by others—"This is who you are", and previous human factors research has explored the relevance of socio-historical display practices for

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contemporary museum and exhibition design [e.g. 1, 2]. Appropriating the metaphor of the 'display case' to address this example of a socially situated, location-specific visual display, the student room is read as a 'display case' for the lifeworld of the student, featuring objects that are selected and positioned for display, and objects that are simply on display.

The student room as a display case is thus an important site for establishing and maintaining these self-referential and self-shaping objects. (It is not the only site however; other important sites are the physical body, and online sites).

## 2. METHOD

In 2006 and 2007 a total of 35 students living in College accommodation at the University of Cambridge were selected from a larger number of volunteers (n>1000) on the basis of gender, degree and faculty. Using methods based on Csikszentmihalyi's Experience Sampling methodology [3] these students were invited to capture aspects of their daily lives using a research-pack containing a notebook, digital voice recorder, and disposable camera, together with the student's own mobile phone. Participants were prompted by SMS message 8-10 times during a 24-hour period, with the following questions: 'What's the time? Where are you? What are you doing? How do you feel about it?' The resulting photographs, diary entries, digital audio recordings, and digital video, provided a rich source of insights, impressions and reflections, and included among these are 66 annotated photographs of student rooms, which are the data informing this paper.

The discussion that follows is presented as a series of observations, each followed by interpretative comment. The observations pertain to the photographs taken by students, so the question of whether the observation is our construction, or is the student's, is mute. We are presented with an image that displays what the student has on display. We are presented with the objects that are displayed in the photograph, and we also have the photograph as a display of these objects. In this sense we are dealing with what Giddens has called a double-hermeneutic [4], making meaning through observations of observations, through displays of displays. The interpretations of these observations are perhaps more clearly ours, but are often informed by the student's annotation of the photograph, as well as the image captured in the photograph, and in this way the students have provided more than raw, unprocessed data.

## 3. DISCUSSION

*3.1 Images displayed in student rooms are typically clustered in some places rather than being evenly or randomly distributed on available surfaces.*

Some 'real estate' within the room is more valuable than other real estate, from the point of view of display. Given that

students spend long periods seated at their desk, orientated in a particular direction with a particular field of view, that field of view constitutes prime display space for objects oriented to self. The photographs indicate that this ‘work zone’ is dominated by the vertical computer screen, and by books and papers on the horizontal desk surface. The walls surrounding the computer screen are also within this zone and most objects displayed here are ostensibly work related—tables of figures, graphs, timetables, lists, hand-written notes and the like. But as explained in 3.2 below, the position of these materials may not be unambiguously instrumental, and work oriented instrumentality may not exhaust an explanation of their prominent display.

Although images of family and friends are not displayed in this prime real-estate as prominently one might expect, they do occur on the desk, by the computer, and by the telephone. This area is a ‘communication zone’ as well as a work zone. Students living in College constitute a community that is living in the absence of family and many friends, and when actually communicating with the persons pictured students can perhaps use the images to more readily visualize ‘presence’ of the absent person. Similarly, when working or multitasking in this area, the student can view the images and be reminded of recent communications and the possibility of communication as another way to reinforce relationships.

It is also useful to remember that the room is a public or social place as well as a private place, and that the ‘public’ that enters the room are student peers who themselves are also living in a social context where close family and many friends are absent. Images of intimates placed in ‘communications zones’ are thus also public displays of one’s current status as a person who has family and friends. I display the fact (or impression) that I am not alone.

Other significant areas for display are the more private zones within the room – the surfaces that are within the field of view from more intimate contexts, such as lying in bed, or whilst grooming. As one might expect, the images on display here are more clearly personal than decorative or work related, and the display of images in these intimate zones rather than in other zones may constitute a way to symbolically reinforce the intimacy of the relationship.

*3.2 Many of the images and ornaments on display (as opposed to the objects at hand) do not differentiate between the scholarly and the personal.*

That is, many images and ornaments for display appear to be both personal (emotive, affective) and at the same time work-oriented (images pertaining to field-work, for example). A distinction between a display that might be personal and emotive, and a display that might be instrumental and purely work-oriented, is not clear. In a similar sense objects such as books and papers that are on display because they are at hand are not necessarily work-oriented in a discretely instrumental sense; they may well be intensely personal possessions in so much as they evoke emotional responses, contribute to the constitution of subjectivity, and to the stabilization of identity. For example, the display of a book, a graph in a math student’s room, or a map in a biology student’s room, functions as an *instrument* of work, a public *declaration* of identity, a private *affirmation* of identity, and an *aesthetic object* of beauty.

The *Bildungsroman* of progression through university education is centrally concerned with the development of young adult identity, characterized by the initiation of multiple new and shifting social and personal relationships. This educational discourse of progression and identity formation goes beyond training, and successfully shapes the student’s self-identity, subjectivity and *Weltanschauung*. The images and objects on display, and the photographs of the images and objects on display, indicate that Self and Work are not alienated. The student is not a person who *does* scholarly work, the student *is* a scholar, or at least, is building their subjectivity, their identity, as a scholar.

*3.3 In all photographs but one, a computer screen occupies a prominent position on the desk, and consequently in the room – in so much as the screen is visible from all points of the room.*

The constraints of the room’s architecture, furniture, and ergonomics, pretty much compel this. Space within student room is cramped, posing *a priori* constraints on students’ use of the space. The prominent positioning of the computer screen for public and private viewing is in this sense a given, beyond the practical control of the student. However, the prominent positioning of the screen (in the photograph and in the room) is also a decision that might be otherwise. All photographs but one show that the students use a laptop rather than a desktop, and a laptop screen might easily be closed (shown in one photo), or put away altogether. Our research shows that the computer and of course its screen, occupies an important position in the lives of the students—in the metaphorical sense of the word ‘position’, and literally, as reflected in its prominent position in space. Structural constraints and agency are therefore both at work in framing the screen front and centre in this way.

In a comparative cultures context it is also notable that the screens on display are largely unadorned. There is no evidence of the “Asian-Cute” phenomena [5], where mobile phones, laptops, and screens (and many other things) are feminised, infantilised, personalised or humanised through extensive applications of accessories (miniature dolls, stickers, plastic covers etc.) Despite their prominent position in the ambience of the living space, or perhaps because of this position, it is the screen content that is on display, not the screen as an object in itself.

*3.4 The photographs show that the computer screen is invariably surrounded by paper media.*

Open books, note-pads, tables of figures, partially completed essays and so forth, are all on display—in the photograph for us, in the room for the student, and for visitors to the room. This is partly a consequence of the constraints of the room’s architecture, but is also a consequence of agency. Constraints can be overcome – it is possible to tidy books and papers away, to only have them in view when they are actually in use—but with one exception, this is not done. Work on display is of course also at hand, and being at hand has a practical advantage. But important for our interest is that work at hand is also on display, and display goes beyond instrumental practicalities. Displayed work is also a personal signifier and mnemonic (that I have read up to here, that I need to do this next), and in the context of the private-public nature of the student room, is at the same time a public signifier of who I am, and what I am, and what I’m doing. Photographing scholarly

work tools that are both to hand and on display, adds another layer to this public display of work, and makes the self-identification of the organiser of the display available not only to the room's visitors, but also to the researchers.

*3.5 Numerous photos display a situation in which food is eaten at the work desk, with the computer running, and books and paper also to hand.*

Eleven photographs illustrate plates of food in the work zone, many comments refer to food, and almost all comments accompanying the relevant photographs refer to some aspect of work. The photos suggest that the college room is not suitable for food preparation, or even eating, yet it is routinely used for these purposes. But this structural orientation towards working while eating can be resisted—by say, eating on the bed, or on one's lap, or on the common, or in Hall, and one suspects that students frequently choose not to, or at least, choose to take photographs illustrating that they choose not to. The photos and the comments suggest that eating in rooms, however constrained, still represent an enjoyable and refreshing break, whether taken in the room in parallel with a work task, or whether taken as an opportunity to leave the desk and have a quick break. It may also be said that eating while working, as a component of multitasking, represents a convivial, even playful, response to work pressures.

The work requirements for students at a research-intensive university are in a sense open-ended, and when the weight of great expectations (from students themselves, from parents, and from academic mentors), meets with a competitive peer culture, the expectation is that long hours are worked, few breaks are taken, and those that are, are taken strategically and instrumentally, in order to better support the work effort. In these circumstances one does not always take a meal break, and one displays the fact that one does not always take a meal break.

*3.6 Almost all images are displayed by being fixed directly to walls or to other furniture, rather than being framed.*

This lack of formality may well be typical of students and young people in general, but may also reflect an attitude to the transience or permanence of the image's subject. A frame may represent a more fixed, 'firm' relationship (affirming or reifying the existence of the relationship) and may therefore be seen as more appropriate for the representation of certain types of relationship and/or event than others (e.g. immediate family, husband/wife, long-term boyfriend/girlfriend; engagements, weddings, graduations, landmark birthday or other celebrations). The current prevalence of digital cameras may enhance this (dual abundance/evanescence of the digital image). Framed images have clearly attracted an investment from the student, or perhaps from the student's intimates, that has not been made in unframed images, and the only two framed examples among the data were family portraits.

In contrast, it is tempting to say that unframed images represent a relatively small investment and concomitant commitment to the image and its content. Indeed, some images and paper displays are clearly transient—ripped from a magazine, stuck to a wall with a single piece of blue-tack, or overlapping other

images—but others are carefully composed, seem to be thoughtfully positioned and neatly fixed in place, in a way that does suggest an emotional investment has been made in the display.

*3.7 Objects as well as images are prominently displayed.*

Knick-knacks such as carvings, figurines, decorative bowls and like also seem popular in the work zone, many of them no doubt being redolent of home, some perhaps souvenirs from childhood and travels. If these ornaments are in fact reminders of other times and other places, it is interesting that they appear more frequently in the work zone than photographic *images* of other times and places. In a culture that is image-saturated, where the capture of digital images is mundane, the display of an object would appear to trump the display of an image. It is also evident that some rooms are very messy whereas others are neat to the point of austerity, displaying different expressions of personality, and indicating that responses to the challenges of inhabiting the space are widely varied. There would appear not to be a single best solution to living in a cramped, undifferentiated space, and no best way of displaying objects or positioning them to hand.

## 4. CONCLUSION

A number of claims are subsumed in the observations made in this paper. A) That all objects placed in view are displayed, not just those that are consciously framed for display. B) That in the context of a space that is both private and public, the display serves private and public needs. C) That chief among these private needs is identity construction and self-affirmation, and chief among these public needs is identity declaration.

The student room is a very particular display case, but we contend that these claims are relevant considerations for displays in general, and especially displays destined for residential settings.

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# Mud, Mobiles and a Large Interactive Display

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## ABSTRACT

In this paper we discuss the interactive installation, 'TxT Book Roskilde', which appeared as part of the Roskilde Festival in 2007. The installation consisted of a user-generated collaborative story projected on to the side of one of the event marquees to which festival goers could contribute via their mobile phones. This type of event invariably presents a number of challenges both in terms of design and deployment of the installation and in this paper a number of the major issues are discussed together with the experience at the festival which inevitably included a great deal of mud as Roskilde Festival 2007 was officially the wettest ever!

## Categories

H5.m. Information interfaces and presentation.

## General Terms

Design, Experimentation, Human Factors.

## Keywords

Mobile, Story, Interactive, Festival, Public Display.

## 1. INTRODUCTION

Whilst there has been a lot of interesting research into the use of displays used within well formed and relatively stable communities [4] there is less known about their use within large short lasting communities such as those formed at large music festivals which exhibit greater similarities with use of displays in bars and nightclubs for specific events such as interactive art installations [3] or games [5]. In this paper we present the design, installation, and observations of the user experience of a large interactive display project created for the Roskilde Festival in 2007 designed to support community activities within the Spoken Word tent which was a venue designated for poetry events.

The Roskilde Festival is held south of Roskilde in Denmark and is one of the four biggest annual rock music festivals in Europe attracting approximately 110,000 people in 2007. It was originally created in 1971 by two high school students and attracted approximately 10,000 people. The festival was taken over in 1972 by the Roskilde Foundation and has continued to grow attracting approximately 110,000 people in 2007. Unlike many music festivals it is run as a non-profit organisation for the development and support of music, culture, and humanism.

The installation was based on the design of a novel mobile game design [1] produced as part of a research project investigating mobile gaming and viral distribution. The project was inspired by the 1920s Surrealist technique of Exquisite

Corpse for creating accidental poetry and the Victorian Parlour game of Consequences. Users contribute to an evolving user generated story by sending a 160 character entry from their mobile phone which follows (if they so choose) the entry from the previous user as shown in Figure 1. The Roskilde installation differed in operation from the original game in a number of ways in terms of the experience presented to the users rather than the technical solution. The most significant aspect being that in the game participation was spread virally to friends via a Short Message Service (SMS) message and participants were only able to see the last message on their mobile with the complete story created as an artefact on the web for post participation viewing. Whereas at Roskilde the experience was based around a simultaneous participation and consumption model that had previously been explored in a geo-tagged photo mash-up event in the UK [2].

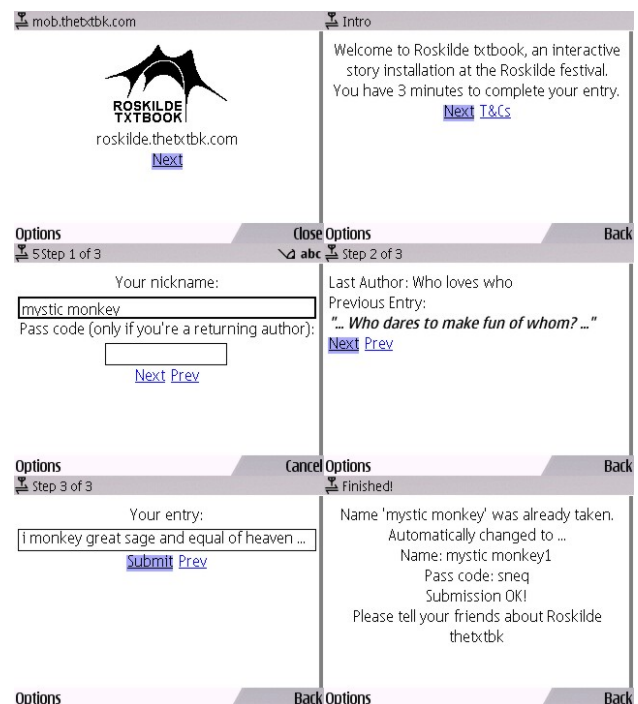


Figure 1. User TxT Book entry from mobile.

The project and this paper are characterised by its multi-disciplinary nature as it utilised ethnographic practices to inform the 'user experience' design and the mobile and web development. The following sections discuss the design rationale and technological solution for the mobile and the display before a short discussion and plans for future work.

## 2. SYSTEM DESIGN

### 2.1 Mobile

The original game design was conceived such that it would not require the installation of a mobile client application and although originally conceived around SMS messages, the game

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mechanic couldn't be achieved without the user incurring costs from sending multiple SMS [1]. Therefore a Wireless Application Protocol (WAP) service was developed to achieve the required mechanic with minimal cost to the users but maintaining the ability for users to spread the service to their friends via SMS. Note that a WAP based solution effectively freed the design from the 160 character limitation of standard SMS [1]. To ensure that the collaborative story had the possibility of maintaining some form of narrative flow, only a single entry at a time was allowed and users had a maximum time of 3 minutes to complete their entry, highlighted in Figure 1, before the system times them out and releases the site for the next entry. In the original game this was only indicated on the user's mobile as per the screenshot on left of Figure 2 but as the TxT Book Roskilde was designed for simultaneous participation and consumption this was also indicated on the display as per Figure 2.

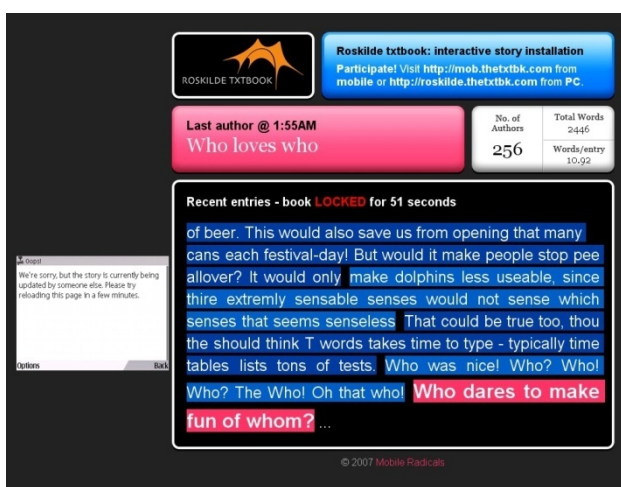


Figure 2. User lockout indicated on the mobile and display

## 2.2 Public Display

The public display was structured and functioned in a similar manner to the original website [1]. The main difference being the colour scheme chosen which was not only changed to reflect the annual Roskilde Festival theme but also to reflect the particular nature of the display.

It was decided, in conjunction with festival organisers, that rather than using a conventional screen, the image should be reverse projected from within the Spoken Word tent using a large projector as shown in Figure 3. In the lower image you can see the display viewed from the inside of the tent and where the blackout covering had been removed to allow the image to be projected directly onto the canvas body. The rationale for this was that the display would engage people outside who were both passing the tent but also those who may be hanging around outside drinking and socialising.

The lower image of Figure 3 also illustrates the requirement for the colour choices, as the original site colour was predominantly white, with each entry represented in subtle changes of colour through the spectrum this would have been difficult to read when projected onto the tent canvas and therefore a scheme which was predominantly black with high contrast was devised. It is also worth noting that although the tent is white on the inside it was in fact green on the outside as shown in Figure 4.



Figure 3. TxT Book Roskilde display installation.

In 2007 the Festival ran from the 1<sup>st</sup> until the 8<sup>th</sup> of July, although the first five days were designated for warm-up and camping with the events at the Spoken Word organised for the 5-8<sup>th</sup>.

One of the design features originally planned was that the system would not allow multiple entries from the same person so IP addresses were monitored and subsequent entries from same addresses was blocked. However, because of the way the mobile operators in Denmark were allocating IP addresses we could have all users on the same network having the same IP address so this feature was removed after the problem was discovered during set-up on the 2<sup>nd</sup>.

## 3. EVENT EXPERIENCE

Amongst attendees, discussion of the Roskilde Festival 2007 invariably starts with the weather as it was the wettest year in the history of the festival. Almost 100 mm (3.9 in) of rain fell during the festival, which was more than double the amount of rain that fell during the previous wettest festival in 1997. Furthermore, half the entire amount of rain came on Thursday the 5<sup>th</sup> which saw rain from early morning until approximately midnight. This meant that large lakes formed in the camping and festival areas as illustrated in Figure 4.

Given these extreme conditions it is perhaps not unexpected that the weather and subsequent measures taken to ensure the festival site remained open impacted on the installation.



**Figure 4.** Rain created lakes and mud and users interacting with display

The following table shows the details of the number of entries to the display in the approximately 4 hour period (10 pm until 2 am) the display was active over six days. Overall there were 222 authors writing 2446 words with an average of approximately 11 words per entry.

**Table 1. TxT Book entries during Roskilde Festival 2007.**

Festival day	Number of entries
3 <sup>rd</sup> July	36
4 <sup>th</sup> July	52
5 <sup>th</sup> July	27
6 <sup>th</sup> July	53
7 <sup>th</sup> July	43
8 <sup>th</sup> July	13

It's interesting to note that the entries were starting to build from the event warm-up but the rain on the 5<sup>th</sup> is most likely to have caused the drop-off on that day. The display did attract attention for periods on the 6<sup>th</sup> as Figure 4 and the number of entries show but again this was affected by intermittent storms.

Whilst we were pleased that we managed to complete the project in spite of the awful conditions and attracting some attention we were disappointed not to attract greater numbers of users. We believe this was due not only the weather but also the method chosen for interacting with the display. Our observations of user behaviour highlighted that the requirement of having to access the URL to make the entry created a much greater barrier too many less technologically savvy users than say simply interacting via an SMS.

One final point to note is that only a small number of entries were actually written in Danish and all the rest were in English. This no doubt reflects the multi-national nature of the event but also the fact the information on the display was written in English.

#### 4. CONCLUSION

Perhaps one rather obvious result of this project was to highlight that creating projects for events such as the Roskilde

Festival present a different set of challenges and opportunities for using public displays in less established communities. Further it showed and that even the best pre event organisation cannot foresee overcome every potential problem and those systems must be flexible enough to accommodate change.

One aspect that did emerge was that for high engagement with short lived communities the key is undoubtedly ease of use and despite the increase in technological enhancement of phones the SMS message is still the most likely means of allowing most potential users to participate. Therefore in the follow up version of the system we are planning to use an SMS short code to allow users to send phrases directly to the display via SMS by removing the requirement for them to view the last message of the previous users. Although the result will undoubtedly have less narrative structure to enhance the user experience we will choose an image from Flickr® that has been tagged with a word from the users entries and then blend multiple images for subsequent entries form a visual narrative.

Overall, and despite the weather, the positive responses from both the organisers and participants leads us to believe this model of combined production and consumption of a digital artefact through mobile phones and an interactive display can be seen as a positive intervention to engage committees who form at such events and can enhance the overall experience and as such is a subject worthy of greater study.

#### 5. ACKNOWLEDGMENTS

Our thanks to Nokia for the provision of software and hardware to the Mobile Radicals research group which was used in the implementation of this project. We would also like to thank Jakob Eg Larsen and Kristian Kristensen of the Technical University of Denmark and the organisers of the Roskilde Festival 2007 for their assistance in the installation of the project.

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# Media Façades beyond interaction

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## ABSTRACT

As part of the research project Digital Urban Living [www.digitalurbanliving.dk], we have taken part in the design of two large-scale installations that employ interactive technologies to facilitate participation and foster social interactions in public, urban settings. We present the two cases, *Aarhus by Light* and *Projected Poetry*, and discuss the future trajectory of our work in this field, as well as some of our findings regarding the challenges of designing large-scale public interactive installations. In doing so, we specifically highlight the possibilities in relation to designing for affective experience and engaging interaction that advocate for a long-term interactive experience.

## General Terms

Design, Experimentation

## Keywords

Urban screens, public displays, media façades, urban interactions, affective experience, engaging interaction, interaction design

## 1. INTRODUCTION

HCI researchers have recently turned their attention to the expanding use of digital technologies in realms of human activity beyond the workplace, including the home, entertainment, the school, museums etc. Urban life, with its social and cultural practices, differs from other aspects of human life, and has different kinds of spatial and material circumstances, which poses new challenges for interaction designers. Malcolm McCullough [9] has in his account of the intersection between architecture and interaction design drawn to attention the importance of addressing the situatedness of urban computing and has as part of that purpose compiled a tentative list of thirty situational types (e.g. watching, idling, cruising, attending, gazing) indicating the complexity and

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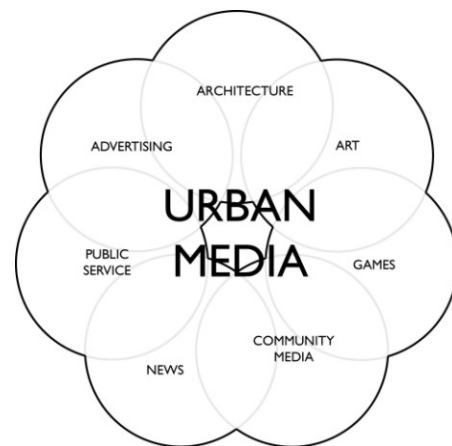


Figure 1. Genres of urban media.

particularity of the urban setting. Adam Greenfield and Mark Shepard [7] have also explored the terrain of urban computing with a particular concern for the local and context sensitive aspects of what they call ambient informatics in contrast to urban computing. In this position paper, we focus on one particular kind of urban computing, media façades, which is the general term for incorporating displays as an integrated part of a building's façade.

Within the domain of media façades a number of genres may be identified (see Figure 1) of which advertising together with news is by far the most common in terms of number of installations around the world while at the same time being the oldest and most influential type of media to be integrated into buildings. The buildings surrounding Piccadilly Circus and Times Square are some of the archetype examples of commercial advertising used as a media facade and Victory Park in Dallas, Texas, is a new large media façade consisting of eleven large-scale outdoor LED video screens used for commercial as well as art purposes [<http://www.mediaarchitecture.org/victory-park-dallas/>].

Architecture has throughout history been constantly on the lookout for new ways of renewing itself with new expressions and use of new materials. Use of mechanical devices are among ways of dynamically altering the facade expression as seen on Institut du Monde Arabe in Paris [<http://www.imarabe.org/>], where iris-like shutters automatically open or close to adjust to the lighting conditions. Art is the genre where artists are the driving forces behind the creation of the media façade, like in the case of Body Movies, an installation by artist Rafael Lozano-Hemmer [<http://www.medienkunstnetz.de/works/body->

movies/]. Games are often used along with other genres such as art or community media. Blinkenlights [1] is a classical example of such an installation where artists placed lamps behind each window in a building in Berlin and used the pixel matrix as a screen for playing pong and displaying low-resolution animations. Community Media is the media façade version of online communities as explored as part of BBC big screens all over Britain. Public Service is driven by the need to provide information to citizens in urban areas, for instance in terms of bus schedules, weather forecasts or traffic info. News is like advertising in some sense the original media façades as in moving message display signs dating back to before the age of digital technology. The number of public news screens is constantly increasing, and seem to keep on doing so in years to come.

## 2. DESIGN CASES: TWO MEDIA FAÇADES IN AARHUS

Using media façades as a subcategory of urban computing our research focus revolve around coming to grip with sense-making and social mediation as part of identifying key characteristics of interaction with media façades in an urban setting. Our approach strongly relies on design research through design [5,11] by conducting real-life design interventions where we have taken advantage of our engagement in specific design practices in order to explore aspects of urban computing affiliated with the center for Digital Urban Living, Aarhus University. The specific cases that provide the fuel for our discussion are Aarhus By Light and Projected Poetry.

### 2.1 Aarhus By Light

Aarhus by Light (2007, [www.aarhusbylight.dk](http://www.aarhusbylight.dk)) was a social experiment with an interactive media façade at the Concert Hall Aarhus in Denmark. In the 180 square meters large façade lived small computer-animated creatures of light. When you approached the concert hall, you entered their world, which was also a part of the city. On the central path leading visitors towards the concert hall were three illuminated zones, each covered with carpets in bright colours (pink, blue, and yellow). In these zones, camera tracking translated the visitors' presence and movements into digital silhouettes on the façade, and through the silhouettes, visitors could caress, push, lift and move the small creatures. The creatures would wave back, fight, sleep, climb, jump, kiss, and occasionally leave and come back, thereby creating a relation to the visitor which is not only physical and embodied but also affective and emotional.



Figure 2. Aarhus By Light

During a two-month period, thousands of citizens walked past the installation. A great part of them engaged in investigating, socializing and acting out in front of the media façade. Regardless of age and gender, people were intrigued by the unfamiliar, yet seemingly understandable, representation of themselves on the screen. This resulted in lots of strange and unusual behaviour while interacting with the façade, marking a departure from traditional codes of urban behaviour.

### 2.2 Projected Poetry

Projected Poetry is a projected public installation set in the centre of Aarhus, Denmark. The installation is to be part of AARHUSCO2030, a 2009 initiative that aims to raise awareness about carbon emissions in Aarhus. The over-all objective of the initiative is to promote carbon emission neutrality by the year 2030. Projected Poetry uses the façade of a prominent cultural institution, Ridehuset, as a display by means of projection technology. On the façade, a number of words relating to carbon emissions and climate issues float around above the heads of passers-by. Some of the words are emphasized to form a statement about carbon emissions. As people approach or walk past, the words pulsate and reach out to them. If a person stops, the word above grows and is turned into a speech bubble. This word can now be dragged to a different part of the façade. In this way, people can create and manipulate sentences relating to climate and carbon emission. The concept borrows from fridge magnets that can be arranged to form statements and sentences.

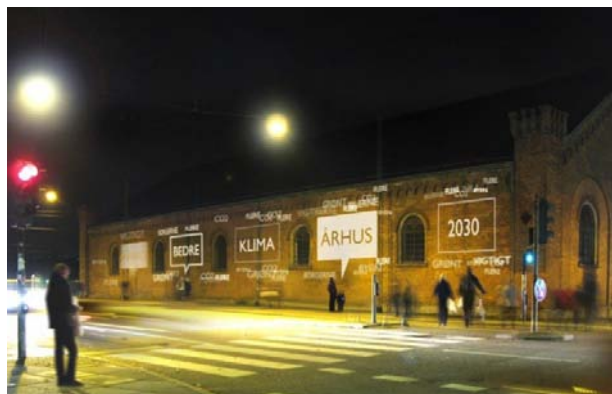


Figure 3. Projected Poetry

Inside Ridehuset, a number of installations are set up to facilitate discussions about climate issues. The Projected Poetry is designed to reflect this use of Ridehuset as a forum for public debate. As such, the aims of the Projected Poetry are thus 1) to catch the attention of the public, 2) to communicate the climate theme, and 3) to convey the understanding that AARHUSCO2030 is about fostering dialogue, debate and public participation with regards to how to address the carbon emission challenges facing the city.

### 2.3 Findings and perspectives

Although the two media façades are related in the underlying research themes and assumptions, we believe they begin to draw the picture of a future research trajectory, which we will now try to elaborate. Aarhus By Light was successful in attracting people to engage in the interaction with the creatures presented on the façade in a walk-up-and-use and short-term

interaction style. The installation did foster social interaction but mostly in uncovering and playing around with the basic technical functionality of the interactive installation as a whole. Aarhus By Light spurred an extensive range of interaction styles on both individual and social levels; and it is clear from interviews and observations of the installation, that it has been successful in staging interactions in urban space that have brought people together and changed their perception of the physical surroundings from passive to active. However, when it comes to more long-lasting effects or engaging experiences, the picture is unclear. We are confident that people have in many respects experienced a “here-and-now” playful interaction fulfilment; however, in the following we would like to open up for a more nuanced view on the potentials of urban interaction design.

Concerning the Projected Poetry, we are trying to heighten the engagement of the interactive experience to last longer than the immediate interaction. While still using much of the basic functionality to spur the initial interaction, the content presented on the Projected Poetry is designed to more fully engage people in not only exploring the interactive possibilities, but in encouraging them to give their own opinion and reflect on the consequences of the climate changes we are witnessing today. We see this movement from pure attraction by interaction, to more profound and long-lasting engagement through the interaction as a research trajectory that we would like to further explore in our future work in Digital Urban Living. Here, we aim at bringing together different research cases in providing interactive installations trying out qualitatively new forms of interaction and content-production. We come from the discipline of interaction design; however, we do believe it is important to stress, that there is more to the design of media façades than the immediate interaction. In the next section we would like to further highlight this point of view in relation to future projects to come in the realm of Digital Urban Living.

### 3. FUTURE WORK

The Digital Urban Living project addresses a diverse array of issues, tensions and potentials. In the following, we shall outline two specific concerns, which are of particular interest for us in our future involvement in the project, namely *affective experience* and *engaging interactions*.

#### 3.1 Affective experience

To describe the perceptive, emotional and cognitive elements of the possible urban interactions spurred by media façades, we find an inspiration in cultural theory and digital aesthetics and the concept of *affect*. Affect is described as the level of experience where our non-conscious bodily experience meets our conscious cognitive experience of ourselves and the world [10]. Affect denotes a sensual and dynamic dimension of experience where our exo-referential experience (perception) is coupled with our endo-referential experience (passion, proprioception, viscerality) in what we term the affective dimension of experience [10]. The concept of affect is therefore useful in working with design of interactive technologies, since it offers a vocabulary to more precisely analyse our perceptual activity in urban space on a micro-level.

On a macro-level, the concept of affect offers a way to understand how human practice in the world is determined by a person's ability to affect the world and a person's ability to be affected by the world [4]. Affect is a lived, dynamic and experiential tendency that in a given situation translates into cognitive and emotional experience of the world founded in an inter-subjective cultural and social dimension [2]. The affective dimension of experience is not individual (in the meaning of being the property of an individual (unlike the perceptive capabilities); it is a virtual space of possible experiential reactions to a given situation, some of which are actualized, some of which remain possible but real in their virtuality [10].

To the future design of media façades, the concept of affect offers a way to describe the synesthetic experiential conditions always present when interacting with these installations. It can be used to further experiment with input technologies on a micro-level creating new interaction forms e.g through kinesthetic interaction. On a macro-level, the concept of affect explores the correlation between a person's ability to think and feel and the body's ability to act in the world. Thus, designing for affective experiences always entails considering how a particular installation might spur long-lasting effects on a cultural and social level by giving the individual user the means to change his, her or others' conception of a given situation. Projected Poetry is a step in this direction, and in the future it would be interesting to work with scenarios where users themselves have the possibility to contribute to the content of the wall (e.g. by SMS or other input technologies). Another scenario would allow the wall to display how much CO<sub>2</sub> a given user was producing at the moment, making it possible for him/her to lower that amount (e.g. by deciding to use collective transportation, by supporting wind mill energy etc.). Both of these scenarios are examples of how the immediate interaction might be both reinforced and prolonged altering the affective experience of the installation altogether. The digital infrastructure offered by the media façades shapes “...both the affective experience of being in the city and the choices we make there.” [7]. And the affective experience is both in the immediate interaction as on a longer-lasting perceptual and cognitive level. In the realm of Digital Urban Living, we hope to be able to experiment both with the interaction forms as well as the socio-cultural content and impact of the media façades.

#### 3.2 Engaging Interaction

Another salient theme in the Digital Urban Living project is to explore the notion of *engaging interaction*. We propose that pragmatist philosophy, particularly that of John Dewey, offers an interesting perspective on exploring and experimenting with the ways in which situated interactive systems and installations may engage users in participation and inquiry. Deweyan pragmatism, or instrumentalism as it is also known, posits that the ‘truth’ and value of our theories and conceptualizations of the world must be evaluated by their consequences in practice, i.e. to which extent they help us experience, understand and transform our surroundings. It is a dialogical perspective that promotes experimental inquiry into the situations in which we are placed through reciprocal action and reflection. “We only think when we are confronted with problems” writes Dewey [Dewey, 1938], and problems spur a process of inquiry in which we try to transform an ambiguous or challenging situations into something stable and meaningful. In this process of inquiry, technology can act both as a constitutive of our

experience *and* as instrument for altering future experience by experimenting with and transforming the situation. This process is dependent on both mental and embodied action, it in fact conceives of the two as inseparable in understanding our experience of and in the world.

On the basis of these key notions, we seek to explore in our projects how new situated technologies may function as means of engaging users in urban settings and create meaningful encounters and experiences. As a concrete example, Projected Poetry may be construed simultaneously as an object of inquiry that invites material-semiotic experimentation and exploration in its own right (it is a new and alien intervention into the cityscape, after all), as well as a tool for inquiry and sense-making with regards to problematic situations beyond the immediate fascination of and interaction with the installation in terms of relating to, reflecting upon, communicating, and socially debating carbon emission issues.

### 3.3 Summing up

In our opinion, affective experience and engaged interaction are two perspectives that both offer important insights into the future design of media facades in an urban context triggering a long-term engagement in terms of production of content and contextual impact. Future projects will further explore the trajectory presented in this paper, hopefully to move beyond the immediate interaction to encompass the whole situation of use.

## 4. ACKNOWLEDGMENTS

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# Sustaining Engagement at a Public Urban Display

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## ABSTRACT

One of the challenges in developing public displays for urban settings is that the seductiveness for passers-by can quickly wear off. People often spend only a short time at the displays, and then rarely return. Two reasons might contribute to this: the content in the display, and the possibilities for interaction with the display, either solo or in groups. In this paper, we seek to understand how to better manage content and interactions and in this way sustain engagement beyond the initial excitement. We introduce activities that require mental energy and ‘stretch’ users to learn skills of increasingly difficulty. We also add content pertinent to the dwellers of the urban environment, a difficult audience to build community with.

## Keywords

Situated public displays, urban environments, multi-user interfaces, engagement, *flow*, interaction techniques, situated content, community.

## 1. INTRODUCTION

Many displays in urban settings are developed to add life to a space and to allow reflection and serendipitous interaction between people. However, often interactions are short—too short to evoke reflection, and it is still to be shown if strangers really engage in interaction with each other.

In this paper we discuss several aspects of a multi-touch environment using CityWall ([www.citywall.org](http://www.citywall.org)) and in particular its first version (Figure 1) as our case study. CityWall is a multi-touch public display on permanent installation in a shop window at the Helsinki city centre since May 2007. The version discussed here retrieves and shows Flickr images tagged with “helsinki” in its display, allowing passers-by to stop and review what has taken place in their home town. Images are displayed at the top of the screen (A) and they can be resized and moved around with simple touch-based gestures. Scrollable timeline (B) allows users to navigate to different days and times of interest.

From the very beginning, interactions at the wall have been recorded for research purposes. This has been based on two methods: 1) logging each touch at the wall in a text file, and 2) using an audio-enabled web camera, fixed to the shop window’s sunshade, to record video footage about the interactions. Based on our qualitative interaction analysis, the kinds of users’ activities common at public displays are [3, 4, 5]:

- *Trying the basic interaction techniques.* Using the timeline in the bottom of the screen and rotating, enlarging, shrinking,

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Figure 1. CityWall user interface: the content area (A), scrollable timeline (B) and picture content (C).

sliding, and throwing the images between individuals and groups.

- *Performative environment.* In a group of people, users often adopt different roles, and take turns at being in one or even all of these roles—depending on circumstances. Roles include apprentices, clowns, spectators and teachers. Teachers show others how to use CityWall and may bring their friends to the wall at a later time.

The continuous videotaping of interactions has allowed us to study the interactions also quantitatively. In one study [5] we took 8 days of video footage into a closer analysis, counting—among other metrics—the numbers of users (1199), durations of interaction, social formations (group sizes and situations with multiple user groups) and their mutual interactions (e.g., do the users from different groups talk to each other).

In this dataset, as many as 82% of use episodes (sequences of uninterrupted use) had more than one user. The display thus served as a site for social interaction, however mostly among the people of the same group rather than strangers, only 4.8% of all episodes having people from different groups engaged in conversation. Interpreting interaction as purely conversation is naturally a simplification. However, this was a means for gauging a conservative estimate of actual amount of social interaction between strangers.

The observed durations of interaction motivate well the problems addressed in this paper. The median lengths of episodes having 1, 2 or 3 users were 39, 60, and 63 seconds, respectively. Average lengths (61, 101 and 95 seconds) were a bit higher meaning that there were some, but not very many, people who spent a longer time at the display. Combined with our qualitative understanding about the nature of interaction at the display, these figures have made us reflect how to change the interaction at the display. The findings from the study suggest that most of the interaction can be described as fleeting explorations of touch-based interaction, with no clear evidence of attention paid to the actual content at the wall, neither in solo nor together with other people. Users certainly enjoy also this kind of interaction, but only a small percentage of people really engage in deeper interaction at the display.



Thus, in a nutshell, the problem is that the initial design goals—evoking reflection and supporting interaction between people—are not fully met. Our approach in this paper is to devise ways to understand and address this problem.

## 2. DIFFICULTIES IN PUBLIC DISPLAY DESIGN

Naturally, ease of use from the very start is an essential requisite for public displays, as the display must be understandable from the first moments. According to our evaluation on CityWall, this goal has been achieved well, but with a cost to the following issues:

- Treating the whole display as a single interaction space means that one user's actions sometimes have effects on the actions of another user. For example, resizing an image to a very large size might overlap another user's focus of interaction, and moving the timeline (see Figure 1) means disruptions for others because all the photos in the content then start moving left or right accordingly.
- There is no memory of past interactions, no functionality to comment images on screen and no means to identify a returning user. Because of this, all the conversations and stories evoked at the wall are lost. Neither is there a way to link related 'photographic conversations', i.e. photos that are posted as a response to photos already there. These factors in turn decrease interest to return later to the wall.
- Images taken by other people have limited relevance to a user unless there is a personal connection to the places or activities depicted. We also found that the participants were mainly passing tourists, and not local residents. Our aim is to initiate discussions of events that directly impact the lives of the residents of Helsinki who pass by CityWall on a daily basis.

These limitations arise from having designed an intuitive interface where novice users can easily approach and 'master' the interaction techniques. We hypothesize that there are not enough opportunities for learning in the current version of CityWall. There is a need to extend the scope of the interactions beyond this early learning curve. As well we aim to find ways to provoke contributions of text and images—passionate discussions even—by providing initial content relevant to an urban community in an interface that entices participation.

## 3. DESIGNING EVER-INCREASING CHALLENGES

We look to the work of Csikszentmihalyi [1] on flow and optimal engagement to continue this discussion and develop the work. Flow is described as an auto telic state, where people lose track of time and any self-consciousness surrounding their activity, as they become so involved in an activity that nothing else matters. When people complete the kind of activity which has put them into the flow state, they feel much better about themselves, and life generally. Activities may range from e.g. mountain climbing, to singing, to painting. There are a multitude of activities that the work of Csikszentmihalyi [1] has shown can produce this state in individuals. In the flow model, the requirements identified for tasks and achieving optimal engagement are that 1) the task that can be completed, 2) the person is able to concentrate on the task, 3) that concentration is possible because the task has clear goals; 4) that concentration is possible because the task provides immediate feedback; 5) that the person is able to exercise a sense of control over actions; 6) the task provides a deep but effortless involvement that removes awareness of the frustrations of everyday life; 7) that the concern for self disappears, but sense of self emerges stronger afterwards; and 8) that the sense of the duration of time

is altered. The combination of these elements causes a sense of deep enjoyment so rewarding that people feel that expending a great deal of energy is worthwhile simply to be able to feel it [1].

The original eight requirements have lately been adapted to understanding flow in gaming [6]. In our work, we are using a similar approach to improve user experience on large touch displays. Our aim is to ensure that the same requirements are included as core values in our design considerations, and design increasing challenges as an integral part of the interaction and content of CityWall.

In the flow model, we find that a match between both the person's skills and the challenges associated with the task are precursors to a flow experience, with both required to be within a certain level (not too simple, not too hard). Most flow experiences occur with activities that are goal-directed, bounded by clearly defined rules, and require mental energy and appropriate skills. We ask, how can we then apply these core values to the design of interactive tasks at CityWall—providing opportunities for learning something new each time a person interacts—with a view to facilitating flow experiences for our participants?

## 4. WHAT MIGHT THESE CHALLENGES BE?

As a means to achieve this, and one that is currently under development, we plan to extend the current interaction paradigm. For now, gesture—a bodily action—meets with a flat 2D screen. The interaction is flattened: limited, as is access to and navigation through in-depth levels of information. As a response, we are designing a 3D navigation for content structure and system. In order to access the information, participants will also need to learn how to navigate the system—as well as being able to learn through interacting with the content itself. Over time with continuing use participants can increase their skill levels. Their interaction can be scaffolded so that small but incremental learning steps are supported. This will allow increasingly more sophisticated interactions with ever-more complex information. The content will deal with local urban issues of environmental awareness relevant to the regular community who pass by CityWall. The navigational interface will mimic the interlinked global nature of these issues. The information—in the form of text, images and videos from Finnish Environment Institute SYKE shows examples of the benefits and nuisances of urban nature. At the time of the opening (8<sup>th</sup> October, 2008), the Wall presents images, videos, descriptions and discussions on how nature in Helsinki benefits and disturbs dwellers. A single tree, for instance, can be both a useful physical shelter, an appreciated element in the urban landscape, a source for an irritating pollinosis and a danger for traffic. Many of the changes in the benefits and nuisances of nature are, at least partly, dependent on human activities. The settling of rabbits as permanent residents to Helsinki, for instance, follows partly from global warming that allows released pet rabbits to survive winters in urban green areas.

The exhibition aims to evoke discussion e.g. on what nuisances people should just adapt themselves to, what nuisances they should fight or control, how different nuisances can be prevented and how the benefits of nature can be improved. We aim to find out what benefits and uses people contribute and how an interaction-based multitouch input display works as a type of community chat tool to enable discussion on topical environmental issues. By enabling SMS, MMS, email, tagging images on Flickr, allowing comments on Flickr (the comments are displayed on the hind-side of the commented-upon images), we are extending the ways in which the citizens can input into issues that affect them—an extended version of *Letters to the*

*Editor.* We have seen already much discussion on for example, the rabbits issue, in the local broadsheets, and have added examples of these to the wall to invigorate discussion. In local newspapers immediacy is restricted and this electronic system allows for more ad-hoc and spontaneous inputs. We are also developing a scrabble-style alphabet with tiles that can be arranged as words and dragged onto images, so people can comment on events and images directly on the wall. It is important to note we have deliberately not included a standard keyboard as we are avoiding computer UI-type interfaces as much as possible. Our aim is to extend the interaction paradigms, not just make larger screens to do the same kind of things upon. In this infrastructure there are now ways to comment upon images on screen and eventually to link related ‘photographic conversations’, i.e. photos that are posted as a response to photos already there, as well as the comment-style conversations we see already on sites such as Flickr. The intention is that this will also integrate comments made with the alphabet, SMSs, and emails etc.

The interaction model requires users input in with single tap, double tap, hold finger to the screen, use of three fingers, as well as that participants learn novel gestures to navigate content. Multiple timelines and multiple ‘worlds-of-content’ are available to many players simultaneously (see Figure 2). We are still in development phase and are currently conducting informal laboratory tests. Feedback to date suggests the current interaction schemas are less intuitive, but once learnt they are more engaging. Information on how to interact will be included as part of the content and ‘play’ of the interface itself.



**Figure 2. CityWall, smaller version in the development lab, allows multiple timelines and multiple contents to be accessed by multiple users simultaneously.**

Three-dimensional interfaces are largely recognised as being more immersive and supporting ‘as if real’, or ‘being there’ experiences [2]; concepts found within presence research. In future field studies we will include standardised presence questions to ascertain if for example, people suspend their disbelief and spatially orientate within the virtual space at the wall. We will also include standardised flow questions to gauge if people for example, lose a sense of the outside world, of time, if they felt extended, if tasks were too easy or too hard. We have conducted similar questionnaires within a triangulation of methods

approach with other mixed reality works and found the results very informative.

With the addition of local content and changing the interaction paradigm we are working to integrate the eight requirements of flow into our CityWall display. We believe that goals related to concentration, challenge, skills, control, clear goals, feedback, immersion and social interaction can be met, if we keep extensively iterating our design. Successful interaction will require mental energy and appropriate skills. We believe that by addressing not only how the participants can interact with the content, but also by adding in-depth and situated relevant content and ensuring tasks are not too simple, nor too difficult, we can extend the experience for our participants and engage them in a more meaningful and sustained manner for longer periods of time. We wish that the enticing interface not only entices but also prolongs and sustains engagement so that our ‘players’ lose their sense of time while playing and learning and becoming involved in a sense of community at CityWall. In the workshop, we will show videos of people interacting at CityWall—evidence of beginning approaches to flow requirements with the first 3D interfaces—and discuss and reflect on the viability of applying the flow model to the design, content and evaluation of the use of a multitouch-public display situated in downtown Helsinki.

## 5. ACKNOWLEDGMENTS

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# Social Incentive & Eco-Visualization Displays: Toward Persuading Greater Change in Dormitory Communities

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## ABSTRACT

In this workshop paper, we describe the design, implementation, and early results of an *eco-visualization* of Indiana University Bloomington campus dormitory energy and water consumption. We (i) present initial results of our ongoing study examining the role eco-visualizations might play in impacting dormitory communities' behavior, (ii) discuss what these findings suggest with respect to how situated displays could help improve community uptake in future work and (iii) describe an emerging conceptual design direction with an eye toward the intersection of situated displays and social incentive.

## Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Design, Human Factors

## Keywords

Eco-Visualization, Situated Displays, Interaction Design

## 1. INTRODUCTION

The intersection of human-computer interaction and environmental sustainability represents a nascent and growing area of interest in the HCI community [e.g. 1, 2, 3, 5]. Moreover, the combined application of situated visualizations and pervasive computing technology presents a compelling context to persuade individuals and communities to intentionally act in more sustainable ways [3]. This design space is particularly well suited to support exploration into *eco-visualization* (EV), which we have elsewhere described as “*any kind of interactive device targeted at revealing energy use in order to promote more sustainable behaviors or foster positive attitudes towards sustainable practices*” [5]. The notion of eco-visualization strongly owes to the work of artist and designer Tiffany Holmes [2], as well as many others [5]. Essentially, EVs shift focus away from frequently hidden engineering solutions toward the design of graphical interfaces and systems to actively persuade participants to reduce their consumption through dynamic—and often engaging—feedback.

Our ongoing project focuses specifically on exploring the role that eco-visualizations of energy and water consumption in Indiana University Bloomington (IUB) campus dormitories could play in

motivating student dorm residents to reduce their resource consumption. Campus dormitories are pervasive structures across most major university campuses and consume considerable amounts of energy and water [4]. In such buildings, student residents often have a high degree of control over their own consumption, however dormitory dwellers typically do not pay directly for their utilities bills and may have less incentive to conserve than a residential occupants who directly pays for their own consumption. Thus, university dormitories present an interesting context to investigate non-financial motivations to conserve in a space where residents have high control over their own consumption and owners have high control over the possible situated display design interventions introduced in the building.

We designed, developed, and implemented a dynamic visualization interface that was deployed in a campus-wide conservation competition (titled the *Energy Challenge*, see <http://energychallenge.indiana.edu>). The immediate goal of this project was to transform student behaviors during the competition, in addition to facilitating changes in participants' long-term behaviors and attitudes toward resource consumption. While initial results from the Energy Challenge competition were notable and encouraging, contextual user research suggested that integration of new design concepts more strongly stressing the social dimensions of student dormitory life could help increase and sustain use among our population; potentially persuading greater behavioral change and a larger total reduction. In what immediately follows, we (i) describe the initial Energy Challenge concept and outcome, (ii) discuss an emerging conceptual design direction for situated displays aimed at more explicitly targeting social dimensions of student dormitory populations, and (iii) conclude with a workshop contribution statement.

## 2. BACKGROUND

### 2.1 The Energy Challenge 2008

The Energy Challenge took place from March 20<sup>th</sup> to April 17<sup>th</sup>, 2008. Students in 10 dormitories on the IUB campus took part in the competition to conserve electricity and water; and the winning dorms received cash prizes and celebratory cookouts. The competition resulted in an estimated combined avoidance of 33,008 kilowatt hours (KWh) of electricity and 724,322 gallons of water compared to baseline consumption of the previous three years. Participants received feedback primarily through the Energy Challenge website (which visualized data from an utilities information database), however there are plans to implement this EV through situated displays more pervasively throughout campus for the 2009 competition. Additionally updates were sent to participants via a facebook group and email.

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## 2.2 User Research

We initially conducted several contextual interviews with undergraduate residents of dormitories across the IUB campus. Key insights arising from our interactions with students included (i) dormitory rooms are often cluttered with electronic devices, (ii) residents are largely unaware of how much energy particular devices and behaviors consume, and (iii) students did not know how to reduce their energy consumption beyond the most common strategies. While some students voiced concern over environmental degradation, participants appeared to be largely unmotivated to change their behavior based on environmental consequences alone. Our observations indicated that students' consumption behaviors are strongly influenced by their peers. Social motivation surfaced as a key component required to ensure our competition's success. According to a student we interviewed, "...if all the girls on my floor really wanted to win, I'd try to save energy; otherwise, I probably wouldn't do anything differently." This suggests our visualization must include a social dimension to obtain a critical mass of participants and facilitate widespread conservation.

## 3. Energy Challenge 08 EV Display

Based on initial user research, we developed two major design components for our EV display (Figure 1).

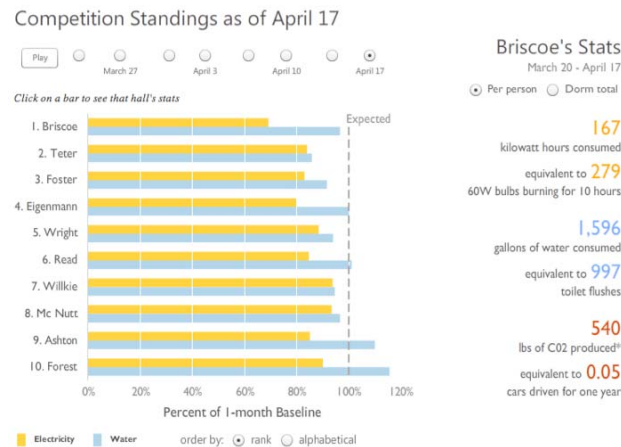


Figure 1. The dynamic Energy Challenge 08 EV display.

The competition standings view communicates the current winning dormitory (i.e. using the least amount of electricity and water) and by how much. The goal of this view is to motivate and facilitate conservation through competition. We explored several different ways of communicating competition standings, ranging from a simple "Top 10" list, to a set of bar charts showing the percentiles of each dormitory's respective standing, which was measured as a percentage of a 1-month baseline. The detailed consumption information view communicates the amount of energy and water being consumed, as well as the environmental impacts of this consumption. The goal of this display view is to motivate conservation behavior by encouraging and facilitating reflection on consumption and its consequences. To communicate detailed consumption information, we listed

several different figures to right of the competitions standings. These figures include more abstract quantities (dollars, kilowatt hours, and pounds of CO<sub>2</sub>) and more concrete quantities (number of trees to offset CO<sub>2</sub> emitted, number of cars worth of CO<sub>2</sub> emitted), which are expressed in terms of per person or per building.

## 3.1 Evaluation & Interviews

Following the implementation of our EV display, we conducted a series of interviews and concept evaluations with IUB students. Our participants' responses suggested several key insights related to designing potentially more effective EV displays for student dormitory communities, namely:

- *Concrete consequences*—figures such as number of trees to offset CO<sub>2</sub> emissions are more meaningful when they are large, aggregate figures (e.g. per building, campus). However, even if they provoke reflection, their potential to motivate action is still questionable, particularly without prescriptive suggestions for actions or social motivation.

- *Abstract quantities*—(e.g. KWh, pounds of CO<sub>2</sub>) are more meaningful when presented on a per person basis, where they appeared to make people feel like their actions are having an impact. With large numbers, people felt hopeless to effect change.

- *Numbers and statistics are generally not motivating*—narratives or data-driven photographic visualizations may be more meaningful.

- *Relevant Instructive Information*—even if people are surprised by their consumption impact, they are unlikely to take actions if they do not know what to do; offering people the ability to calculate estimated savings from a variety of energy-saving behavior suggestions could provide more engaging alternatives.

In terms of motivating conservation behavior, it appears that leveraging social motivation and competition should take first priority, along with providing concrete suggestions for conservation behaviors. The social networking group created for the competition using Facebook accumulated approximately 150 members over the course of the competition—and noteworthy interactions did emerge. Nonetheless, even considering it is unlikely all 10,000 students living in IUB dormitories were frequent users of Facebook, this rate of adoption remains low. Among other things, this may suggest more pervasive design interventions, such as situated displays more strongly targeting our population's social dimensions are necessary. Moreover, in response to the survey question "What issues, if any, prevented you from participating more fully in the Energy Challenge", 44.2% of respondents (n=49) selected "No one else was competing so there didn't seem to be a point." While significant amounts of students did in fact participate, these patterns of interaction need to be made visible in ways meaningful to participants and relevant to their social context. Essentially, without strong social incentive, it seems unlikely that students will even take

the time to investigate our detailed consumption view, no matter how interesting and informative it may be.

#### 4. Social Incentive & Dormitory Communities

We have developed additional concepts pertaining to each of the aforementioned design insights, however incorporating social incentive in the design of future EVs appeared particularly promising to persuade greater behavioral change in dormitory communities. As noted, many students felt that they would only be willing to participate in the conservation competition if their peers were also motivated. Our EV display encourages social motivation to the extent that it facilitates competition to conserve by providing clear indicators of the competition standings and feedback on consumption. However, the power of social incentive can further be leveraged to raise awareness and encourage conservation behavior; and will likely be most effectively implemented in situated displays *apropos* of the high frequency of social spaces and contexts characterizing student dormitory life.

##### 4.1 Student Pledge Wall Situated Display

One design concept we are developing in this conceptual direction is the *student pledge wall* (figure 2). The idea of this design is to complement our initial EV with the ability for students to pledge conservation behaviors selected from a pre-defined list. The pledges will be shown on situated displays in key social areas, such as lobby dormitories, and pledge data will also be used to dynamically calculate projected savings and competition standings.

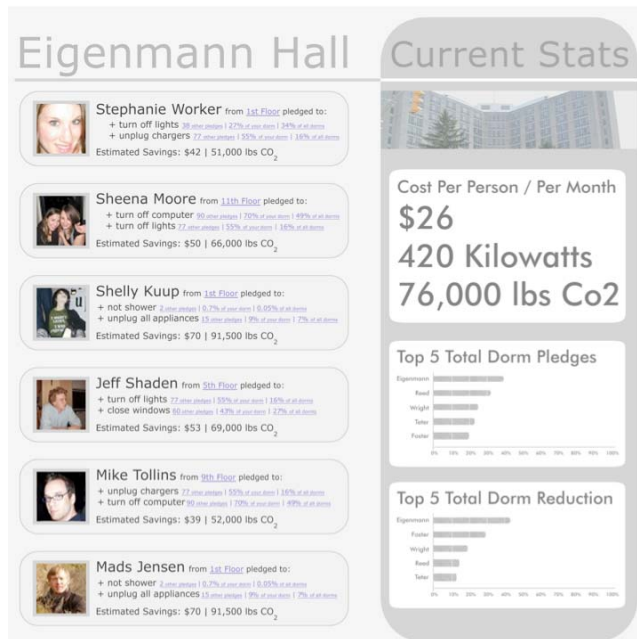


Figure 2. This early prototype of the pledge wall illustrates the combination of social networking with consumption feedback.

By allowing students to make pledges, the hope is they will feel more empowered to enact change and also become more engaged in the competition. The public display serves as a persistent reminder to students to keep their pledges and also

provides an informal medium for students to receive credit for their contributions. We also plan to experiment with using dynamic quantitative graphs to illustrate the comparative relationship between *projected* impact of pledged behaviors and the *actual* ongoing tabulated reduction. This technique could reveal deeper insights into underlying motivations behind communities' commitment to change with respect to particular behaviors and their actual actions. Moreover, this information could lead to new design techniques and strategies to effectively impact this disconnection. By publically displaying student pledges in key social spaces of each dormitory building, students may be more likely to engage in and sustain participation in the competition.

#### 5. Conclusion

While the field of eco-visualization is becoming increasingly diverse, at present the dominant approach to designing EVs is to create consumption monitors that clearly present—often quantitatively—consumption patterns. While past studies have indicated that this approach can lead to decreased consumption [e.g. 4], we believe that other approaches, such as those employing situated displays, may lead to more engaging experiences and further reductions in consumption.

In this workshop, we hope to contribute reflections on (i) challenges faced in designing the Energy Challenge EV, (ii) feedback obtained from our target population, and (iii) new design concepts on the horizon. In particular we aim to discuss the intersection of social incentive-oriented EVs and situated displays as a means to persuade greater resource conservation in student dormitory communities; ultimately in the service of construction of future design interventions to facilitate more sustainable behaviors and interactions.

#### 5. ACKNOWLEDGMENTS

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# Nnub: A Display for Local Communications

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## ABSTRACT

Designing technologies to support community communication in local place-based communities is a considerable challenge. This paper outlines research that aims to foster participation and grow the use of local communication services by making them as useful as possible. The initial design of a public display visible to the community in a community hub is discussed, in addition to the challenges of appropriating the built environment for public use, and soliciting community information for public use.

## Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Design

## Keywords

Community Informatics, Situated Displays, Participatory Design, Social Networking, Social Software

## 1. INTRODUCTION

Our research aims to understand how urban residents communicate in reference to local interests and how to design Information and Communication Technology (ICT) to support these local place-based community communications.

There is great potential for personal, public and mobile computing devices to support timely communication, creative expression and information sharing in place-based communities. Such networks could also support dynamic data collection and visualization with respect to resource use, traffic, community events, creative arts, etc.

Yet, so far place-based use of the Internet seems under explored. The enduring methods of communication in our local communities are printed local newspapers that retain editorial control of contributions, physical noticeboards, face-to-face meetings and contact via phone, flyers, newsletters and email. Local community web sites and other communication initiatives

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often wither due a lack of contributions, particularly when hot issues subside and local champions burn out. It seems likely that we do not yet understand sufficiently the nature, motivations, and interaction design needed in place-based communities in order to establish sustainable and dense webs of communication. A crucial issue for place-based environments appears to be who owns the means for putting messages in places that are easily visible to the rest of the community and what means do the public have to appropriate public displays and signage.

## 2. BACKGROUND

Our initial research questioned how people communicate in reference to local interests and focused on Moggill, an outer suburb of the City of Brisbane, which is experiencing both the opportunities and the challenges of growth.

With a need to communicate about the developments in the area we found that people who were motivated to take action largely participated in private-strategic activity [2]. This activity was shared amongst a group of people working together as a Community of Practice (CoP) [3] and although they often needed to convey messages to the broader local community, ideas were formulated in private communications among trusted members. Email was used extensively for these private-strategic communications. Public messages were emailed to the wider association, distributed on flyers and public meetings were held.

Analysis of the collected data revealed that in this case local resident private-strategic activities evolve CoP that ultimately suffer from passive membership due to an expectation that only experienced and active members are capable of successful action. The success of local organizations usually depends upon the efforts of a committed few. To compound this problem, active member withdrawal from local CoP activities due to burnout results in loss of the knowledge associated with the individual.

In Moggill, while several organisations do publish web content about their local activities and interests, efforts to network the content are not apparent. Community Networks such as that in Blacksburg Electronic Village and Seattle Community Network appear to be the exception rather than the rule, relying upon community champions for their sustained development.

Our experiences led us to wonder whether different forms of communication media could lead to a denser web of easily accessible community communications sustained through spontaneous community contributions rather than the efforts of champions or the mechanisms of the local press that are subject to editorial control and various fees. This led to the design of a digital community noticeboard on display at the Moggill General Store.

### 3. COMMUNITY NOTICEBOARD DESIGN

The Moggill General store and local state primary school are located opposite each other and together create a community hub that people use for everyday activities such as collecting children, and for community events such as public meetings and school fetes. The city council bus service also stops near to the Moggill store and school. Schools and shops are significant hubs for both daily and longer-term local community activity. The Parents and Citizens Association of the local school has undertaken the task of raising funds for a community hall.

The digital noticeboard is situated in the Moggill store to allow rapid perusal of community content in a place that is passed by many local people frequently. The general store is frequented by the school community, nearby residents and tradesmen working on local development among others. The clientele consists of many people with varying interests in the local community, and varying ICT knowledge and access, who pass by in their everyday routines.

The design intention of the public display is to increase the awareness of local activity and give presence in the built environment to messages targeted to a local audience. It aims to engage residents with simple interactions that afford collection of local community content for public display and as reference for discussion with both local and non-local people. Anyone can post a notice.

The interface of the display is interactive and is modelled on the appearance of a physical noticeboard. The name of the community digital noticeboard is "Nnub". The Australian Oxford Dictionary defines a nub as a point of gist (of matter or story), and Nnub could be considered a neighbourhood nub where the point or gist of the neighbourhood is captured in text and images uploaded by local people. Neighbourhood nub has been abbreviated to Nnub.



Figure 2. Nnub touch screen interface

Notices and photos (output) are displayed to people at the store on a large screen monitor with touch screen functionality. The public display allows browsing (no searching) through categories of notices and photos, and is the most likely introduction local people will have to Nnub. Categories for the notices mimic the categories of the store's non-digital noticeboard. A simple web interface allows any user to search and browse notices and photos, and registered users to upload, edit, and comment posts. A desktop computer is installed at the

shop to provide web interface access and examples of use to people without computer access or knowledge. The research team administers moderation of submitted postings, solely to screen for posting of pornography and profanity.



Figure 1. Nnub at the Moggill General Store

### 4. METHOD

Although the idea for the display was derived from community consultation, an iterative participatory development approach similar to Rapid Agile Iterative Development (RAID) approach of Heyer et al. [1] used to design digital social networking applications has been adopted.

Using this method, a basic prototype is deployed and then iterated by examining use and obtaining ideas and feedback from its user community. The prototype grows as it supports a growing community network that is using the prototype. The kinds of user issues faced shifts as the prototyped is developed and the user community grows.

Although the approach does have an element of technology push about it, there is little commitment to the form of the technology and designs are seen as provocations in order to inform what kinds of media can effectively support broader community communication through only small investments on the part of participants, and the potential benefit of making a connection through reading or posting a notice. It is known that champions will engage, but the question remains, can a broader section of the community be engaged and supported in daily communication activities such as posting notices, such that a communication medium develops a heavier usage pattern that also supports transient activities and sustained community development initiatives. This is an open question at present.

### 5. FURTHER RESEARCH

Our research is raising the question of whether it is possible to develop lightweight generic Web 2.0 applications such as digital noticeboards that can serve to meet or augment the communication and publicity needs of local organizations, reducing the need for sustained effort from community organisations to attend to communication strategies. This is a tall order and it is unlikely that such a strategy will meet all community association needs. However, it is clear that participatory social networking software, noticeboard style interfaces, wikis, and photo sharing offer opportunities for more

lightweight distributed methods of community engagement and that public displays can render such activity visible.

At present public messages that have presence in the built environment such as billboards, signage for shops and the mere presence of monumental buildings are almost exclusively sending messages to people from business, government and media organizations. Increasingly, television is broadcast in cafés and other public spaces such as airport terminals. Use of media that successfully broadcasts or publishes in public space is expensive, and targeting the message to attract the attention of particular audiences demands rates that are only possible for business, government and media organizations to fund.

Since services require resources in order to grow and maintain them, the next step in growth of networked noticeboards would potentially involve working out issues such as business models, public/private ownership, and open sourcing. At each step the ability of people to participate in the design and to secure rights to use is at stake. The attempt to appropriate public space for community use is less a matter of known design process and more a matter of strategic engagement with local business leaders and political leaders who have aligned interests and who can benefit from and support the project. It seems to follow that the most inclusive models will be those that maximise participation in the use of services and maximise the

connections made between people. The role of the participatory designer becomes one of fostering appropriate engagements and championing and guarding core values that underlie the design philosophy, in this case, democratic civic engagement.

## 6. ACKNOWLEDGEMENTS

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# Exploring the Use of Non-Digital Situated Displays in a Rural Community

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## ABSTRACT

Public, situated displays of information are truly ubiquitous, found in all walks of life providing a wide range of information—but not necessarily in digital form. In this paper we present a survey of non-digital situated display usage in a small, rural community in North West England, with the intention of exploring how community display practices might be improved by digital technology.

## 1. INTRODUCTION

Information is ubiquitous, and while digital situated displays may yet have some distance to cover before they can fully reach their potential, existing non-digital noticeboards and information displays surround us in the workplace, social spaces and even the home. These displays of information may be used on a daily basis, providing a wide range of information and forms of interaction, which are often so ubiquitous as to be transparent.

Over the last two years, we have worked with a small rural community in Wray, North West England, developing and deploying a public photo display [5] in an effort to understand the ways in which public displays can help to support notions of community, and the user-centred techniques which we can use when designing these displays. From the outset, feedback collected from residents has frequently spoken of a desire for a broader range of content, including various forms of community information which might commonly be found on noticeboards, such as advertisements, timetables and newsletters. For this reason, we are particularly interested in the ways that existing public displays, especially noticeboards, are utilised within the community.

However, the use of information displays is often governed by various codes of conduct, both written and unwritten, which may be extremely specific to a particular environment. For example, Lancaster University's campus has a number of large, locked noticeboards dedicated to particular services, such as the student cinema or housing office, many smaller boards managed by the students' union, and hundreds of flyers and posters taped



Figure 1. A noticeboard in Wray.

to pillars along its central walkway, governed by a 'poster code' which dictates appropriate behaviour, in addition to unwritten understandings, such as when it is permissible to cover up an older poster. While this may be an extreme example of regulation surrounding information displays, it is clear that any designer of digital noticeboard systems for use in communities must have some appreciation of these codes of conduct.

In this paper, we present the formative stages of our effort to understand the use of public displays in communities, in which we explore the existing use of noticeboards in Wray and their strengths and weaknesses when compared to possible digital alternatives, similar to prototype noticeboard systems developed for use in the workplace [1,2,3]. Through discussions with residents and a detailed survey of noticeboards in the village across two trips, we examine how these displays are used and the implications of these usage patterns on digital display design.

## 2. COMMUNITY DISPLAYS IN WRAY

### 2.1 Overview

There are numerous information displays in Wray, from noticeboards to road signs, fulfilling a variety of different purposes and with greatly varying levels of formality, maintenance and security. Most obvious are the designated noticeboards located outside the village hall (Figure 1), post office, church and local café, and inside the post office. These noticeboards host a wide range of content, from advertisements to official notices, representing the main method for general residents to post information publicly.

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Proceedings available online at:  
<http://wraydisplay.lancs.ac.uk/ozchi08>



Figure 2. Noticeboard advertisements.

Beyond these noticeboards, there are a surprising number of information displays which are so transparent that they are taken for granted during day-to-day interactions—the plethora of road signs and other pieces of highly location-specific information displayed in any village or town. For example, the village has several bus stops, each with a timetable—while these may seem mundane, bus services in a rural community may be infrequent and yet those without their own transport may be entirely reliant on these services to reach shops and other facilities, making this information particularly important.

## 2.2 Content

Community information comes in many forms, and this is reflected by the variety of content displayed around the village. The most numerous of these by far appeared to be advertisements. Typically these advertised small, local businesses (including beauty therapists, driving lessons, tuition, contractors etc.), as well as items for sale by residents and advertisements for small jobs. It seems logical that these smaller businesses will utilise local noticeboards rather than more expensive advertising methods, and that the community would wish to support them over larger companies.

Both upcoming village events and historical information are displayed prominently in the community. For example, during one visit, several noticeboards displayed advertisements for the annual produce show and the upcoming appearance of a touring performance group, while an engraved metal sign on one building declares: “Built in 1704, this former Quaker Meeting House is now used as Wray Methodist Sunday School”, and both the village hall and local pub display historical photos. This emphasis on current events and historical information is reminiscent of our past findings that residents were particularly interested in historical photos of the village and photos of recent events [5].

In addition to this content, various displays also show information about local services, maps, wildlife and activities, as well as information about health services and charities which may be of interest to residents. This is often highly localised, not only to the local area, but also to the vicinity of the display: the display outside the church is exclusively for church information, a series of displays near footpaths outside the village show information about walks and wildlife, and the post office counter and is surrounded by numerous posters and flyers advertising services they offer.

## 2.3 Permanency

The permanency of information displays varies greatly, as one would expect based on the varying degrees to which different information remains current. Information displays thus range from permanent fixtures which are intended to remain indefinitely, through to very temporary signs for specific, short-term events which might be valid for hours or days, with an entire spectrum of information in between which may remain valid for weeks or months.

During our fieldwork, we saw warning signs and apology notices around roadworks and signage advertising a special event that morning at the village school at the very temporary limits of this spectrum, and signs built directly into the brickwork of buildings representing the most permanent. Between these two extremes, photos of displays taken on various visits across two years show both a great amount of variation in adverts on noticeboards, but also more permanent notices which seem not to have changed during our work.

## 2.4 Access Control

Several of the village’s noticeboards, particularly those outside, have glass doors, primarily for protection from the elements, but also as an effective form of access control. Although doors outside the village hall are unlocked, allowing public access, the noticeboard outside the post office is reserved for local council use and remains locked. Interestingly, the church noticeboard’s doors are unlocked, though content seems to be exclusively church-related; this suggests a certain amount of trust in residents to behave appropriately, and a degree of respect for these unwritten codes of conduct from community members.

## 2.5 The Effect of Technology

While noticeboards and other information displays themselves may not be digital, they are not unaffected by modern technology, and many show clear signs of the impact technology has had. Many notices have been created using desktop publishing applications and many, even those which are handwritten or homemade, contain email or website addresses.

We were particularly drawn to an item on the nature noticeboard, where an email printout regarding local wildlife sightings had been posted directly on the board (Figure 3), mirroring existing prototype systems which allow web content

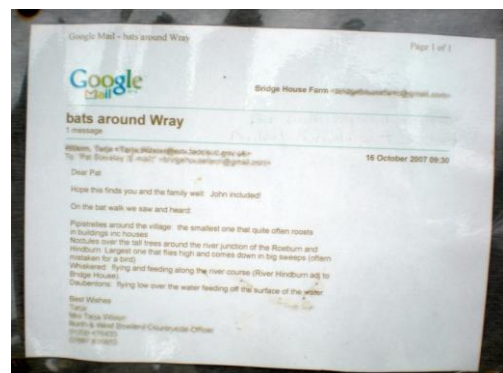


Figure 3. An email printout on a noticeboard.



**Figure 4. An drinks refrigerator appropriated as a noticeboard.**

to be posted on public displays. It is also worth noting that the contact details of the recipient (a local resident) and sender (a local government official) were included in the email.

### 3. NON-DIGITAL VS DIGITAL

Our aim with this work has not only been to gain an understanding of displays in the village, but also to highlight issues with existing displays and how they might be addressed by a digital solution, but also the strengths of simple information displays which might be lost.

‘Stale’ content seems to be a considerable problem for non-digital displays. Frequently, it appears that notices are left on displays long after their expiry date, with the effect of ‘cluttering’ the display and making new items less noticeable, while also potentially becoming confusing or even outright deceptive. One particular item on the village hall noticeboards caught our eye: a faded flyer advertising the original deployment of our photo display two years ago in August 2006, including its original (and now incorrect) location in the village hall, alongside a further flyer inviting participants to complete our web survey from August 2007. This item and many others were also ambiguously dated, referring only to the date and month. While this is perfectly understandable given the intended lifespan of flyers, there is clear potential for confusion when unintentionally left for longer periods of time. A digital solution to this issue might allow expiry dates to be set on notices, and even increase the visibility of notices as important dates approach, while applying indexicality [4] to determine an appropriate level of detail.

During discussions with residents, problems with ‘outsiders’ posting items on noticeboards were also raised. In one instance, a window cleaner from outside the village had posted his own advertisement over the top of one belonging to a local window cleaner, which was seen as inappropriate. In a digital system, we can imagine some form of moderation which would either prevent such unwanted content from being posted, or at least quickly remove it.

However, while non-digital displays may have issues which could potentially be addressed by technology, it is important to

note their many advantages. We cannot overstate the obvious ease of use presented by paper flyers, the affordability of large displays, and their durability in a public or outdoor environment. If a digital display is considerably harder to use, it is likely that residents will simply opt to post a paper notice rather than use the digital system. Additionally, paper flyers and posters can be displayed almost anywhere, allowing any surface which seems to afford noticeability as an information display to be easily appropriated. In the village post office, for example, the side of a branded drinks refrigerator has been used as a noticeboard rather than a less visible board around the corner (Figure 4), obscuring the logo and obstructing its ability to function as an advertising device. It is difficult to see how this level of flexibility and ease of use could be replicated in a digital system with today’s technology and designing to support such flexibility and appropriation is a key challenge.

### 4. SUMMARY AND FUTURE WORK

Our brief formative study has shown the wide range of ways that information displays are used, even within a single small community, and the relative strengths and weaknesses of these displays when compared to potential digital solutions. We intend to continue working with Wray towards the design of a digital noticeboard deployment which might augment these existing information displays.

However, it is becoming clear that careful thought needs to be given to the social conventions surrounding notices in the community, and the difficulties of use which might pose a barrier for any digital system. With deeper analysis of existing displays and further discussion with residents, we hope to continue to develop a greater understanding of these subtleties.

### 5. ACKNOWLEDGMENTS

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# Exploring the Display in Disaster Recovery

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## ABSTRACT

This paper considers how people close to the earthquake in Sichuan in May this year engaged with different kinds of displays immediately afterwards – their home computer, mobile phones, public noticeboards, the television. We present examples of such interaction and describe instances of content presented on them. We then consider the potential role of and design issues with displays in the longer term in the context of one earthquake-affected community.

## Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Design, Human Factors

## Keywords

Natural disasters, ordinary technologies, displays, community

## 1. INTRODUCTION

The earthquake in Sichuan, China that occurred on May 12, 2008 killed over 69,000 people and injured over 370,000<sup>1</sup>. The event also marked an astounding recovery effort on the part of the Chinese people with the government spending US\$441 billion dollars on relief and reconstruction and sending 50,000 troops and armed police to the most badly affected areas<sup>2</sup>. The earthquake marked unprecedented access by journalists to affected areas<sup>3</sup>, at least for a time, to report on this effort. Chinese television and radio stations continually broadcast news of the disaster and user-generated content – such as video captured at the time of the earthquake, reports of individuals' heart-wrenching experiences and anti-government opinions – littered the Internet via online newspapers (e.g. the search "Sichuan earthquake" returns 644 documents on the China Daily site), YouTube video clips (e.g. the same search of the YouTube site returns approximately 3,700 hits<sup>4</sup>) and personal blogs (the same search retrieves 28,844 using Google's 'blog search' function) – some blogs even referred to predictions that the earthquake would occur<sup>5</sup>.

Touching and upsetting stories emerge from such terrible events. One newspaper story reported on a mother found buried in a position to protect her child with the message on the screen of her mobile phone: "my dear baby, if you can survive this, please remember that I love you."<sup>6</sup> A YouTube video reported on a family who had lost their only son through the earthquake<sup>7</sup>. Such stories not only point to the ubiquity of ordinary technologies and their ability to record and report on tragic events – through a text message in the first example and video in the second – but also the willingness to embellish news stories (the veracity of the first story has been questioned<sup>8</sup>) and engage in self-indulgent voyeurism with little significant or lasting outcome for the individuals and community concerned.

Such events place a huge strain is placed on public infrastructure (e.g. mobile phone networks, the Internet, roads), both in terms of physical damage and heightened use. For example, rural areas close to the earthquake could not be reached for several days after the earthquake via the mobile phone network<sup>9</sup>. Remote areas could not be reached by road due to damage<sup>10</sup>. Coordination among and mobilisation of relief agencies also presents enduring problems. In HCI and CSCW some work has focused on these, short-term aspects of recovery – namely coordinating relief efforts and mobilising people (e.g. Palen and Liu, 2007; Johnson, 2005). Government policy and initiative tends to focus on the rebuilding and maintaining of public infrastructure – for instance the US\$146 billion targeted for relief efforts will fund "health, education and other basic services" as well as "housing construction, industrial development, environmental protection and big-ticket infrastructure projects"<sup>11</sup>.

These are all very real, pressing and legitimate concerns that form essential background for the main body of this paper's focus on displays and community and direct our attention to the importance of different genres of 'broadcast' and 'user-generated' public information being available immediately after such a traumatic event via different channels. Here we wish to adopt the analytical view that these 'different channels' are intimately connected to the notion of a display and argue for the importance of considering a notion of 'community' when

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<sup>1</sup>[http://en.wikipedia.org/wiki/2008\\_Sichuan\\_earthquake](http://en.wikipedia.org/wiki/2008_Sichuan_earthquake)

<sup>2</sup>[http://en.wikipedia.org/wiki/2008\\_Sichuan\\_earthquake](http://en.wikipedia.org/wiki/2008_Sichuan_earthquake)

<sup>3</sup><http://articles.latimes.com/2008/jun/05/world/fg-rollback5>

<sup>4</sup>[http://www.youtube.com/results?search\\_query=sichuan+earthquake&search\\_type=&aq=2&oq=sich](http://www.youtube.com/results?search_query=sichuan+earthquake&search_type=&aq=2&oq=sich)

<sup>5</sup><http://www.caijing.com.cn/2008-05-19/100063293.html>

<sup>6</sup>[http://shanghaiist.com/2008/05/19/heroic\\_tales\\_of.php](http://shanghaiist.com/2008/05/19/heroic_tales_of.php)

<sup>7</sup><http://www.youtube.com/watch?v=nmmgWoENFIY>

<sup>8</sup><http://www.zonaeuropa.com/200805b.brief.htm#020>

<sup>9</sup><http://english.people.com.cn/90001/6409078.html>

<sup>10</sup><http://estate.chinanews.com.cn/sh/news/2008/05-12/1246756.shtml>

<sup>11</sup><http://chinadigitaltimes.net/2008/11/china-to-spend-us-146-billion-on-quake-reconstruction/>

considering the emotional consequences of such a disaster as well as issues with long-term recovery.

## 2. DISPLAYS AND COMMUNITY

There is a burgeoning literature on displays and community (e.g. Greenberg et al., 2001; Taylor et al., 2007; Foth et al, 2008). In this paper we wish to draw on and apply Bowers and Rodden's (1993) discussion of "exploding the interface" and Mynatt et al's (1997, 1998) discussion of networked communities.

Bowers and Rodden's (ibid) argue that the notion of the interface is "intimately tied" to notions of "separation" (e.g. between 'the user' and 'the computer'), "attribution" (e.g. of particular properties to 'the user' and 'the computer'), "problematization" (e.g. issues with the interaction between 'the user' and 'the computer') and "localisation" (e.g. the "site" where problems need to be solved). They also argue that: "*Interfaces are the provisional and temporary sites where these<sup>12</sup> trajectories collide and problems get articulated.*" They conclude concerning this view of the interface that: "If this means 'exploding' the interface into many fragmentary sites where 'interfacing' goes on, then so be it." The key point here is that we cannot assume they important divisions invoked by the term 'interface' (e.g. people vs computers) but need to question these 'separations' etc.

Mynatt et al (ibid) describe 5 basic characteristics of networked communities – that they are mediated through technology, persistent, involve multiple interaction styles and that they support real-time interaction and authorship from multiple users. They also describe three further characteristics that "support the evolution of networked communities into socially cohesive spaces": a sense of shared space with agreed boundaries, social organization and particular affordances; the management of the traversal through the real and the virtual via identity and representation, relationships and reshaping activities and; the inevitable evolution of the community through technosociality, learning, history and change. As demonstrated by Taylor et al. (2007), 'the interface' can play an important role in sustaining and developing a community – in their case a village community in the North of England.

In a similar fashion to Bowers and Rodden (ibid) this paper adopts the perspective that different displays are sites where particular work gets done and particular things are worked out. As with their definition of 'interface' our use 'display' does not assume particular properties, relationships, problems and localities. Instead we examine and exemplify different forms of displays – mobile phones, the television, work and home computers and public noticeboards – used in the aftermath of the Sichuan earthquake. We present examples of these different displays, grounded in evidence from fieldwork and our own experience. Our intention is to explore the current and potential use of displays in the possible development of different aspects of a (networked) community responding to tumultuous events in the long-term.

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<sup>12</sup>They are referring to "technical, organisational, procedural, social, political and even emotional" issues here.

## 3. APPROACH

This paper is grounded in one of the author's experiences of being involved in a close family member's response to the news of earthquake in Sichuan and then visiting Chengdu city 6 weeks after it happened (23<sup>rd</sup>, 24<sup>th</sup>, 25<sup>th</sup>, 30<sup>th</sup> June) and areas badly affected by the earthquake around the same time (26-27<sup>th</sup> June) and then again on 26<sup>th</sup> and 29<sup>th</sup> October. During the visit to Chengdu the author interviewed 3 people concerning their experiences. Over the two days visiting areas outside Chengdu that had been badly affected by the earthquake the author visited a small town community, three temporary schools, one temple and a church community. During the second visit in October the author visited the small town community affected by the earthquake twice to probe the effects of the earthquake. The final visit to this community on 29<sup>th</sup> October involved discussing video clips that two members of the community had captured via a mobile phone and a digital camera. The interviews and visits resulted in photographs and video clips.

## 4. EXPLORING THE DISPLAY

In order to investigate the role and use of the display around the time of the earthquake we use extracts from interviews and observations in earthquake-affected regions.

### 4.1 Television

Figure 1 below shows temporary accommodation erected in a small settlement associated with a fertilizer factory outside Mianzhu – a city of over half a million people about 30 km from the epicentre of the earthquake. One of the authors interviewed some people in a makeshift room shared by all family members, asking them about their experiences.



Figure 1. Temporary living areas in Mianzhu

Author: *And the television has the television been available here?*

Translator: *Yes, in the evening. They have a TV here. [Figure 2]*

Author: *So...did you watch the television a lot during the time of the earthquake?*

Translator: *Yes, normally television news, definitely will watch it.*

Author: *...So did you watch it to keep up-to-date with the...*

Translator: *Yes, they need to know all the informations and also need to know how they get through this period.*



**Figure 2. The family’s television in the makeshift room**

In Chengdu city a couple described how they kept up-to-date with the latest news on the earthquake:

Translator: *When they came back home they switched on the TV and also the broadcasting, the radio...He [the man] couldn't sleep and almost 24 hours he was on TV and just, he uses everything together as, as much as possible.*

Thus the broadcast media – television and radio – were essential to these people for getting essential information about the earthquake.

#### 4.2 Internet

Internet access in the settlement in Mianzhu was limited – it could only be accessed through a computer in the factory office. An author asked the couple in the city about Internet access during the aftermath of the earthquake:

Author: *So for example...did he use the Internet to find particular information that wasn't coming through the television?*

Translator: *Yes he would do that.*

Translator: *Of course they discussed over the phone and on the Net...with friends far away they used email. Blog is very slow a lot of people wouldn't choose it. So the fastest way is the telephone calls.*

A writer whose family lived in Mianzhu described how people used blogs to express opinions about the earthquake. He described one instance where a blog posting had criticised a poem written by a government-sponsored poet and how this posting had been blocked.

#### 4.3 Mobile phones

The writer in Chengdu described how he could not contact his family for several days because the mobile phone network was not operational. The family living in temporary accommodation in Mianzhu confirmed this:

Translator: *It [their mobile phone] didn't work at that time but the next day it was getting better.*

The couple in Chengdu confirmed this again when the author interviewing them asked them about what they did after the initial shock of the earthquake:

Author: *When things settled down what was the first thing you reached for, what was the first form of communication you tried to use?*

Translator: *Mobile phone. But that didn't work.*

The man in the couple then described how: *“It was extremely important for him to stay in touch with what happened...”*. He noted how:

*“...when the earthquake happened only his mobile phone could work so he...and his head of the company...he happened to be in Beijing at that time and he called him from Beijing...his boss was able to tell him about this because they didn't know where the earthquake happened...It's because they couldn't call each other – they didn't have any information.”*

This incident, slightly bizarrely, shows how a person further from the epicentre of the earthquake (in this case his the man's boss) had more detailed information about the incident than those actually experiencing it, the immediacy of mobile phone communication and its importance for contacting others.

#### 4.4 Public notices

There are many examples of public notices playing a role in the field data collected. These varied from banners encouraging people (see Figure 3 below) on the roadside and in public places, to information about local police forces (Figure 4) to public health information (Figure 6) to regular community noticeboards advertising items for sale (Figure 7) and listing people.



**Figure 3. Roadside banner on the way to the earthquake-affected area**

The banner roadside in Figure 3 reads: *“Ling Long tyre enterprise whole-heartedly supports the rescue effort in the earthquake area. Resist the earthquake, rescue people. United together we become a great wall.”*



**Figure 4. Information outside a temporary police station**

The information boards in Figure 4, outside the ‘Branch office of the public security bureau’ (or police station), display information such as key personnel involved in the area. This

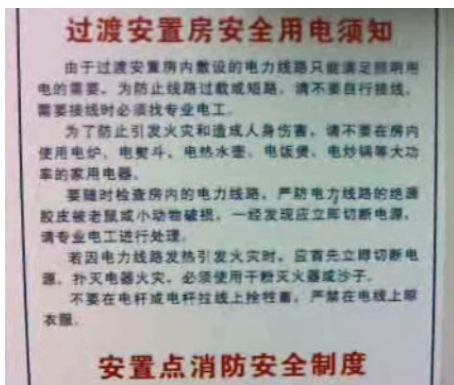
police station was situated in a large area of temporary housing created in the aftermath of the earthquake to house people whose homes were unsafe or destroyed.

The sheer size of the temporary housing area is indicated by the need to create a map of the area (Figure 5) and post in on a large board next to the ‘new town’.



**Figure 5. Map of the temporary town in Mianzhu city**

There was also public health information placed on notices within the temporary housing area itself. Figure 6 displays information concerning how to use electricity and prevent fire.



**Figure 6. Public health and safety information in the temporary town**

The last three figures are images taken from video captured by a member of the settlement outside Mianzhu.



**Figure 7. Noticeboard in settlement outside Mianzhu**

Figure 7 shows a noticeboard entitled: “Basic moral code for every citizen” with various virtues listed below it – these are the

permanent characters in while. On the noticeboard itself and on an adjacent board were notices advertising items for sale and lists of people’s names.

## 5. DISCUSSION

The field data from the Mianzhu settlement and the city of Chengdu points to multifarious displays indeed being located at ‘fragmentary sites’ each providing different levels of immediacy – the instantaneity of the mobile phone against the sluggishness of a blog – and affordances – blogs as channels for opinions against the television as a channel for information – supporting different kinds of work – the “information work” (Strauss et al., 1985) done by static displays against the “sentimental work” (ibid) and “contact work” performed by mobile phones. All these displays are indeed “provisional” (Bowers and Rodden, 1993) – in the sense that the relevant separations, attributions, problematisations and localisations change and evolve. An important separation here is between variously connected peripheral, dislocated members of a community affected by the earthquake and those who are ‘core’ and ‘local’. The ‘variously connected’ include those with a tight coupling with the community – the city writer trying to find out if his family are safe – and people with an avid interest in the details of the earthquake – the city couple – and the various displays that ‘reach in’ and that support ‘reaching out’ change their role as a result.

What the perspective that we have adopted here directs us to is issues of interlacing different media channels, different forms and genres of content and the expressiveness of different media channels and how particular ICTs (and displays) might play a role in supporting the various communities affected by the disaster in the longer term. These kinds of concerns extend beyond ‘formal’, short-term “information work” and “articulation work” associated with disaster relief, rescue and remedy (e.g. Palen and Liu, 2007) towards longer-term, continuing recovery, grieving and remembering.

The settlement outside Mianzhu represents a community whose peripheral members maintain contact through mobile phone calls and which is persistent and enduring despite the changes enforced through the earthquake. A key difference between Chengdu and the settlement outside Mianzhu is that physical situated displays had an important role in the rural community while this was not evident in the city. What we can observe is the ‘retreat’ of the display into personal space in the city (e.g. computers in the home) and away from public areas. Another important difference is the degree to which different people “reached out” (Grudin, 1990) via various displays to the communities affected by the disaster as opposed to the disaster “reaching in” (Bowers and Rodden, 1993) to the homes of people via television, radio and the Internet.

Considering how and why this community might become a “networked community” through leveraging the different displays already in place presents both challenges and opportunities. Challenges concern justification given the enormity of other needs, the robustness of public and private infrastructure and exactly how ‘interlacing’ might work, the forms of media content that might be appropriate and the levels of expressiveness they support.

Drawing on Mynatt et al’s (1997, 1998) key notions of boundaries, relationships and change we see two potential ways of meaningfully and purposefully engaging this community

through different interaction styles, and multiple authorship of content in the activities of a “networked community” thereby potentially engaging peripheral, distributed members in ongoing interactions across the ‘real’ and the ‘virtual’. Our concern is to distinguish proposed display content from the video segments and the heart-wrenching content alluded to in YouTube above and instead ground the potential designs in the particular community studied. We also wish to address the practical action of ongoing recovery within the community, as opposed to the need for sentimental stimulation by outsiders. In doing so we aim for any displays to ‘reach into’ the community and ‘reach out to’ peripheral members instead of merely ‘reaching out to’ the anonymous.

## 5.1 Digital memorials

The photographs and video collected by those affected by the earthquake presents a unique opportunity to remember the earthquake, its place in the settlement’s history and the change it caused. Figure 8 below<sup>13</sup> shows parents holding photographs of their dead children at a memorial service at primary school in Fuxing, Mianzhu that collapsed after the earthquake killing 128 children. Parents laid photos of their children on top of the debris that marked the remains of the school<sup>14</sup>.



**Figure 8. Parents holding photographs of their dead children**

A digital display of photos contributed by family members at a particular site may serve the purpose of reshaping the community as well as simply supporting the remembering of loved ones. The act of sending a photo to the display, via Bluetooth for example, may both be a realistically costed means of remembering (Maunder et al., 2008) and form part of a ritualised act of remembering and grieving. Graham and Rouncefield (2008) have argued that the act of sharing family photos in Chinese homes forms part of the remembering family and friends and can be understood better in terms of the long-standing Chinese tradition of ancestor worship. However, this work describes private, intimate displays of photos and ‘going public’ would likely involve negotiating some sensitivities.

## 5.2 Video segments

Visual recordings provide the opportunity to embed the research subject and participants in context (Rosenstein, 2002). Video

recordings are particularly useful where people express communication and emotion principally through nonverbal cues and actions (Rosenstein, 2002). Self-captured video, made available through displays and across devices, has the potential to communicate information, address health issues (O’Brien, 2008) and highlight difficulties in the community. As they seek out and select phenomena to include in their video recordings participants engage in an active reflection upon their lived experiences observing and framing their experiences through the video lens. This reflection is not limited to the capture and editing phases of video making but extends to the post viewing engagement with audiences during situated community screenings. Conversational interviews with the video authors provide opportunities for researchers to engage in a more dynamic research relationship that can help to erode the ‘invisible wall’ between researcher and participant encouraging the emergence of a negotiated ‘fluid wall’ that characterises participatory visual research activities (Shrum et al., 2005).

Video engages with the flow of everyday life providing an insight in to the non-verbal, emotional and physical context of everyday lives. The recorded audio soundtracks enhances the visual record and deepens our engagement with the social world further, encouraging a more critically textured sociology that is both sensual and dynamic (Rosenstein, 2002). The presence, or absence, of people, their image or sounds can draw attention to the intangible ‘atmosphere’ of the disaster: the sense of emptiness, loss, grief; the challenge to the normality of noise and persistent social interaction that characterised everyday life prior to the disaster. The display of video materials represents more than a simple viewing of past events. It encourages a personal and collective emotional response from the viewing audience that can stimulate community debate and action. While video, as a tool cannot eradicate the problems that communities face the problems can certainly be shared, stated and exposed through the capture and display of the video materials (White, 2003).

## 6. CONCLUSION

We have briefly considered people’s experience of the Sichuan earthquake through focusing on different displays and their existing and potential role in a particular community. We argue for the need to address long-term recovery and the ensuing “sentimental work” (Strauss et al, 1985) in display design through the use of different media.

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