

Sustaining Engagement at Public Shared Interfaces

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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 this way sustain engagement beyond the initial excitement. We introduce activities that require mental energy and ‘stretch’ users to learn skills of increasingly difficulty.

Keywords

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

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 as our case study (see Figure 1 and www.citywall.org). CityWall is a multi-touch public display on permanent installation in the Helsinki city centre since May 2007. According to our research the kinds of activities common at public displays are [2, 3, 4]:

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

In our study [4] which included manual coding of 8 days of authentic interaction, 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

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

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 interaction from the footage.

For durations of interaction, 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, and therefore there were some people who spent a longer time at the display. The general lengths however are not high as could be wished.

Therefore, 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.

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.

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. 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 [5]. 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 global issues around environmental awareness and the navigational interface will mimic the interlinked global nature of these issues. The information—in the form of text, images and videos from World Wildlife Foundation (WWF), includes a space-time dimension and reveals changes in local rainforests and habitats over time. In addition, with an attempt to provide more personal content, we plan to include a WWF measurement system for analyzing one’s ecological footprint. With this interface, multiple groups can access multiple ‘worlds of linked information’ at the wall at the same time.

We are working to meet the eight requirements of flow. We believe that goals related to concentration, challenge, skills, control, clear goals, feedback, immersion and social interaction can be met. 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 content (task 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 at CityWall. In the workshop, we will show videos of people interacting at CityWall—evidence of beginning approaches to flow requirements with the first 2D interfaces—and discuss and reflect on the viability of applying the flow model to touch-screen design.

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