Magic Moments in situated mediascapes

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ABSTRACT
In this paper, we describe the situation and factors that lead to "Magic Moments" in mediascape experiences and discuss the implications for how to design these magic moments without them appearing contrived. The distinctive feature of mediascapes is their link to the physical environment and we introduce a framework for Experience Design and describe a set of design heuristics which should extend the field of HCI to encompass aspects of user experience, mobility, the outside environment and facets of the new medium. The findings are primarily based on analysis of public reaction to Riot! 1831, a mediascape in the form of an interactive drama which is based on the actual riots that took place in a public square in Bristol, England in 1831.

Categories and Subject Descriptors
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1. INTRODUCTION
The availability of affordable personal mobile devices with increased media capabilities combined with pervasive computing technologies and infrastructure such as GPS and wireless networks has enabled a new medium for creative expression to emerge based around locative media. The new medium creates a digital landscape which overlays the physical world, whereby every place can become a stage for a rich new experience. We call these experiences mediascapes, applications that run on mobile computing devices such as an iPAQ or mobile phone, which deliver or capture digital media in response to contextual cues such as location.

A diverse range of digital media experiences, created by artists and researchers have been developed [2,3,7] and in the cultural heritage domain augmented reality systems are emerging [1].

This paper draws on our experience to date in design and trials of located mediascapes. It highlights the factors and situations which have led to *magic moments;* those moments which are deemed to be both moving and memorable and thus are those that people really value. Our analysis of the factors that lead to these magic moments provide an initial set of heuristics for future mediascape design.

We will use one such mediascape, an interactive play called Riot! 1831, as a detailed example to illustrate the design process and methodology that we have used to develop and evaluate mediascapes. Set in Queens Square in Bristol, this experience is as if you were walking through an invisible riot. You are tuning into history, eavesdropping on a magic parallel world. It's full of surprises, it's funny, poignant, moving and it brings history alive. The mediascape works simply by knowing and responding to your movement and location. As you walk around the square with a GPS enabled iPAQ and headphones you trigger different audio regions which play according to predetermined logic designed by the content creators.

2. THE TRIAL
Riot! 1831 was made available to the general public in a three week long research trial. Over 700 people tried out the experience, resulting in 563 usable questionnaires, 531 trace file recordings of people's movements around the square, 30 semi-structured interviews and four in-depth ethnographic case studies.

On returning their equipment visitors were asked to rate six questions. Three questions asked how much they enjoyed it, how much history came alive and how immersed they felt. All three scored highly with mean ratings of 74.5, 73.7 and 73.3 respectively on a scale ranging from 0 (not at all) to 100 (very much). Much of the evidence in this paper is taken from the semi-structured interview data and analysis. Thirty interviews were conducted with people who had just completed the experience and said that they were willing to be interviewed. Fourteen of the interviewees were couples, five were men, eight were women and three were family groups.

We will now look in more detail at why people enjoyed Riot! 1831 using quotes from the structured interviews to illustrate our points. We will also examine the implications for future design.

3. MAGIC MOMENTS
The distinctive characteristic of mediascapes is their relation to the physical world, the process of walking through that digital layer and interacting with digital media which can take you into a parallel world that is one of the magical aspects of mediascapes.

3.1 Walking through a sea of voices
In Riot! 1831 the combination of a large number of different sound files and a constant background sound of a riot meant that the user was continuously "In" the riot.

Woman: I think the whole walking around its quite nice to walk around and you do get quite immersed in it.

Man: Yes because there are a lot of small things happening in the square at different times so walking round the square you pick those up

In contrast to some structured museum audio tours the experience was much more chaotic and the choice of where to go was completely up to the user. "*… this one there was no pointing, no button pressing it was all around you*"

Most people enjoyed the act of "strolling" and having their hands free "*I did find on a cold day like today it was nice to be able to put your hands in your pockets and not have to hold anything and just listen"*.

Those who became immersed in the experience were not troubled by the chaotic nature of the delivery, they did indeed feel as though they were walking through a sea of voices.

Those who responded with a low score for immersion wanted more structure and context. Factors such as problems with the technology that caused sound files to cut out were also cited as affecting the person's ablility to become immersed.

We have observed that immersion is a transient state that can be fleeting or can last for several minutes. The circumstances that move people between immersive and non-immersive states are therefore an important consideration for future designs [4]. For example in Riot! the use of a background loop of a general riot sound was an important factor in keeping people in the experience.

3.2 Physical and virtual collisions

Another kind of magic moment occurs at those points of unexpected connection between physical and virtual worlds, for example when you hear a description of lovers on a bench and then you notice some in front of you, or you hear a seagull cry in the headphones and then one flies past.

In Riot! 1831 these times occur when the mapping between the virtual world, that the user is imagining in their head, matches with some artifact like a building, bench, statue or tree in the physical world. "*At one point I got the feeling I recognised a name that was mentioned "Miss Vigors" is it? And of course we were very close to the mansion house or the custom house and then a couple of doors down there was the door Ms Vigors - that was indicated on the map and then I realised ahh this is what this thing was all about - if you are close to a spot in the square then you would get the story related to those individuals*."

When the intrusion in the physical world has resonance with the virtual world then the experience is heightened and the user can easily remain absorbed or become re-immersed in the virtual world. When the intrusion jars with what is being heard in the virtual world then it will pull people out of the experience and thus it is harder to become re-absorbed or immersed. "*I felt I was in a world of my own and when someone rushed over to me and told me walk in the middle of the square he made me jump and I thought who's this strange person because I felt I was in another world*."

In general people are receptive to making more of an experience by trying to make these connections between the physical world they are walking through and the virtual world that they are simultaneously experiencing. At these moments the senses are heightened to the coincidence of the event and it feels almost supernatural, as if events in the virtual world have somehow moved across into the physical world. The challenge for future designs is how to heighten the likelihood of these natural coincidences without making them feel contrived. Whereas a pure coincidence happens by chance we need to design for co-incidence; that is creating events which we know will happen synchronously in the real and virtual worlds. Knowledge of the environment and the kind of events that tend to occur naturally will be critical. For example if you know that seagulls can often be seen waiting for scraps at lunchtimes or that certain games like Frisbee are often played in the square when it is sunny and dry then descriptions of these kind of events can be woven into a mediascape. Knowledge of the type of fashions and commonly seen apparel can also be used so that for example if mention is made in the mediascape of "a lady in a red coat" and then one happens to walk by this would cause one of these magic moments.

3.3 Synaesthetic confusion

The feeling of confusion caused when you do not know whether a sound is real or part of the mediascape was often mentioned. *"I heard on my left I actually thought something was moving over here so I was looking but there was nothing happening."* Although it is more disturbing and weird rather than pleasant and relaxing, the sensation is still memorable and therefore counts as a magic moment. "*when we were walking round the other side and the charge was on a skateboard went past and it just sounded like bullets! (Laughs) It was a bit strange*" Many experiences, notably thrill rides or horror movies, rely on causing fear or discomfort in the audience. Mediascapes have a similar potential, their ability to change your senses so that you are not sure what is real and what is virtual is very powerful. "*I stood in a cannon which was really loud and scared me*". The boy who felt that he had actually stood on an exploding cannon recounted the experience several times to his friends and family as well as to his teacher and class mates in a school lesson.

Good future designs should build up awareness of the virtual environment and create a state of receptiveness in the user so that the frightening or atmospheric sequences will have the most impact. Part of this can be achieved through the choice of the atmospheric effects and the quality of the sound. The rest will be through the skillful placement of regions and narrative structure. In Riot! 1831 the narratives were recorded in a studio and the effects were added afterwards. Simple use of stereo worked extremely well and everyone remarked on how good the sounds were.

3.4 Looking at the world with new eyes

The location of the play in the square where the actual historical events have taken place was important. It seemed to have more resonance and to matter more to people who were from Bristol. People began to look at a series of familiar markers in the landscape with different eyes, the square was in this sense defamiliarised [5]. For Shkovsky, defamiliarisation is one of the most important functions of a work of art, art makes us look again at the taken for granted, at our everyday assumptions. *"I work in the building over there, so next time I look out the building I am not going to look out in the same way"*

Even for non native Bristolians the experience not only brought history to life but changed how they viewed the square. This is how a European visitor to Bristol viewed the experience *"Oh its good because otherwise you walk here and you say oh a very nice square a statue and you would sit on a bench and take a picture*

and then you would move on. Whereas that is not the case now. You see that it is filled with history."

One of the main factors that brought on this sense of history coming to life was the fact that this was the actual square in which the riots took place. This authenticity was clearly important to bringing on this sense of wonder. *"Yeh theres one thing to read about something and see pictures but when you actually hear the pain and the anguish and a bit of the gore that went along with it, it makes you think well this actually happened."*

In addition to the sense of history people just enjoyed spending time in the square, having an excuse to linger and take notice of the surroundings.

3.5 Traversing the square

It was not uncommon for people to spend over an hour in the square, listening to the experience. Over the course of the 21 days the weather was extremely variable. On sunny days the square would be full of people playing football, frisbee and just sitting on the grass which made it harder to walk round the whole square. On very wet days the grass was too sodden and wet to explore fully. In Queens Square there are distinct paths that cross the square and most people tended to stick to them. When designing the layout of regions and choosing which sound files to play it is important to take into account the most common routes around the square and the changeable conditions.

Figure 1. Queens Square and an example circular traversal

People had to choose their own route around the square which as one man reflects is quite unusual "*Well you are used to a set route there are always arrows, even if you go to IKEA they route you round"*. From studying the trace files we identified four main categories of traversal. A random walk where no clear pattern or structure was evident and then three structured categories paths, circles and police march. Paths are structured from the physical layout whereas circles and police march were user-invented structures. Examples of each are shown below. It was noted that approximately 50% of the visitors traversed the square in a random manner whilst the other 50% showed some kind structure to their traversal, mainly that of walking on the paths.

In a circular traversal usually the outer perimeter is circled and then the person spirals inside walking around in increasingly smaller circles (figure 1a). The police march traversal uses a criss-cross pattern that can be either horizontal or vertical from one side of the square to the other.

3.6 Social Bonding

To experience Riot! 1831 it was necessary to wear headphones. The headphones that we lent out were quite large and covered the whole ear, although they did not completely block out peripheral sounds. Obviously the use of headphones cuts down the ease with which people could communicate with one another. However it did not mean that the experience was totally unsocial. The headphones and the back pack provided a form of identification by which participants could notice each other. Some described this as being in a form of club because it was a loose bond between people you might encounter in the square who otherwise would be complete strangers. "*Yeh we were bumping into other people and they were smiling and saying oh try over there and that kind of thing. You know you are speaking to people you wouldn't necessarily speak to and that kind of thing. Or necessarily interact with.*"

People who walked around together with separate packs would often assume that if they were near each other then they would be hearing the same thing. The random logic meant that this would rarely be the case and it sometimes took users a while to realize this.

Visitors could choose whether to each have their own backpack or share one with someone else. If they chose to share then one person would wear the backpack and a headphone splitter was used to enable two sets of headphones to plug into the same device. This meant that the pair were physically tethered together and would hear exactly the same thing at exactly the same time. This made the experience quite different. A magic moment can occur when the shared context evokes a gesture or feeling of social bonding giving a shared private moment within a public space.

Son: We would like smile at each other when something happens
Father: Yes and no-one else was aware that we were hearing the same thing because there was no one standing beside us so that was quite nice I thought.

4. DESIGN IMPLICATIONS

Unlike classic HCI methodologies Experience Design of mediascapes need not start with a user need or user studies. This is not to say that knowledge of the users is not a vital part of the process it is just not always the start point. For example in the design of the Riot! 1831 mediascape the start point was the context or environment which determined the subject matter, application and interaction design. An overview of the framework that we have developed for Experience Design is shown in Figure 2.

The framework is not a linear or cascade design model, it is meant to be cyclical and non linear and each section interacts and has impact on the others. The inner circle is a prototype, test and refine loop and our approach is to combine iterative development and testing with analysis and evaluation of the context, content, interaction design and user studies. As our models and design for each quadrant deepens we validate those designs and ideas by testing prototypes. Many great concepts that we have discussed and designed in meetings fail when they are actually tried out in the environment and it is only really through testing in the actual environment that the failures can be discovered and refinements to the design can be made.

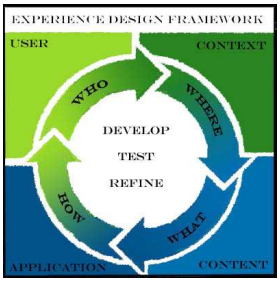

Figure 2. Experience Design Framework

We will now summarize the design implications that have been discussed in this paper.

- Continuous sound through the use of a background loop can keep the mood of the mediascape but the design and choice of background loop is vital to avoid becoming too obviously repetitive.
- Being able to walk relatively unencumbered through a safe outdoor space is pleasurable. People liked to be able to put their hands in their pockets.
- Coincidences between events in the virtual world and the physical world are memorable. Intimate knowledge of the environment, the kind of people, regular events, animals and weather conditions that you are likely to encounter can help in the design of mediascape content so that natural coincidences are made more likely.
- Design for immersion recognizes the need to smoothly move the user in and out of immersive states without jarring them and pulling them out of the virtual context too inappropriately.
- Synaesthetic confusion can be a deliberate design choice and can be achieved by mimicking sounds in the mediascape that happened in the real world.
- For history based mediascapes exposing authenticity is a powerful emotive mechanism to make people feel a connection to the past.
- People will use the most obvious navigational structures in the environment like paths, tracks or signs. Weather significantly affects the kind of people and events that occur in a space and the likelihood that people will walk on grass or away from paths.
- There is opportunity for social bonding during the mediascape experience. A natural affinity between other participants is formed and those who share the experience through the use of the headphone splitter become a private pair, sharing a world that no one else can hear.

5. CONCLUSION

The new medium of situated mediascapes shows great potential. Evidence from the trials that we have conducted thus far indicates that the kind of experiences that can be delivered over the new medium are enjoyable and engaging. They have the potential to help people look anew at their environment and see the world in a different way. It can provide pleasurable, frightening and fun experiences.

We have identified those "magic moments" that are commonly reported in the mediascape experience. These have been

- The phenomenon of walking through a sea of voices
- Unexpected connections between the physical and virtual worlds
- The synaesthetic confusion caused when you are not sure if a sound is real or virtual
- Seeing the world with new eyes
- Sharing a private moment in a public space

This paper has been a first step to provide design heuristics for mediascape authors and producers who want to recreate these kinds of magic moments in future mediascapes. We have focused in detail on the results of one particular field trial and mediascape, Riot! 1831, but the guidelines can be applied to many different genres of mediascape.

The current version of the development framework, which produced Riot! 1831, has been released for free public download for non commercial use and is available from the Mobile Bristol web site [3] for anyone to experiment with. We hope that a community of practice will arise around the use of the platform so that we can develop the language, design practice and insights gained through using the new medium.

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7. REFERENCES

[1] ARCHEOGUIDE website:http://archeoguide.intranet.gr

[2] Benford, S., Rowland, D., Flintham, M., Drozd, A., Hull, R., Reid, J., Morrison, J., Facer, K. Life on the Edge: Supporting Collaboration in Location-Based Experiences. *CHI 2005*

[3] Hull, R., Reid, J., Geelhoed, E *Delivering Compelling Experiences through Wearable* IEEE Pervasive Computing, 2002. **1**(4): p. 56-61

[4] Mobile Bristol http://www.mobilebristol.com

[5] Reid, J., Geelhoed, E., Hull, R., Cater, K., Clayton, B. Parallel Worlds: Immersion in location-based experiences in *Proceedings of CHI* 2005

[6] Shkovsky, V. 1986. Art as Technique in *Contemporary Literary Criticism. Modernism Through Poststructuralism.* Edited and with Introductions by Robert Con Davis. Longman Press, New York and London: 56

[7] Williams, M., Facer, K., Fleuriot, C., Reid, J. & Hull, R. *Mobile Bristol: A New Sense of Place in Ubicomp'02*. 2002