Designing for Audience Engagement

Workshop proceedings NordiCHI 2012, 14-17 October, Copenhagen, Denmark

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Published by: ECA - The University of Edinburgh

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Edinburgh, Midlothian
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ISBN: 978-0-9575148-0-5

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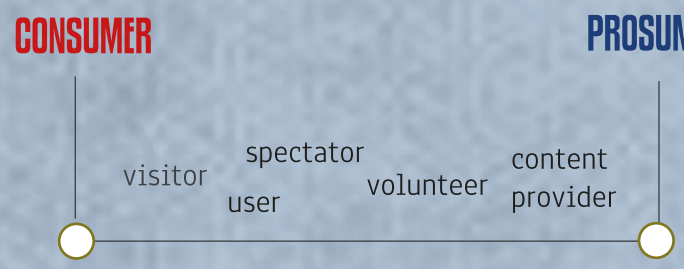

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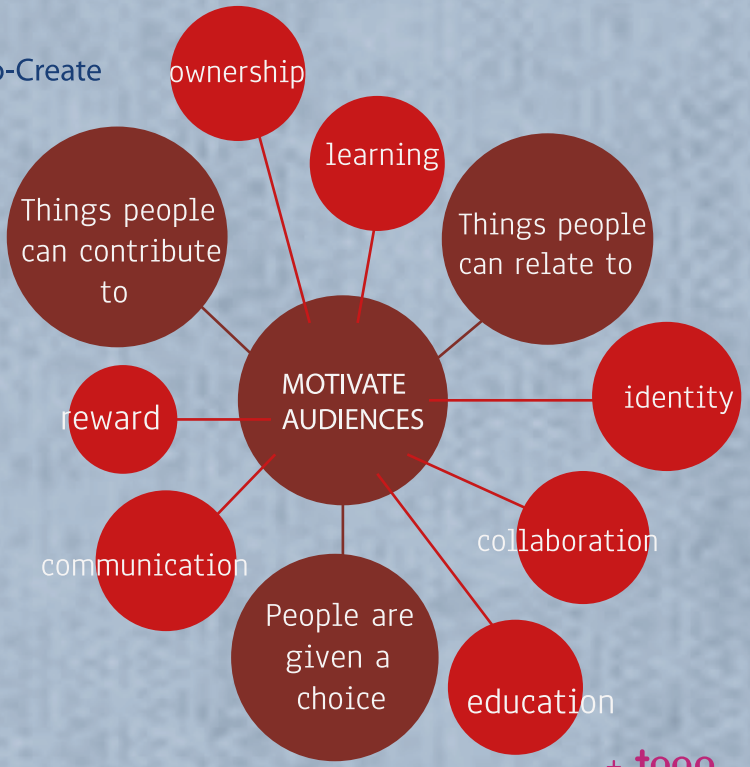

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Preface

Who is your audience? In the age of social media it's becoming even more important to understand and engage with audiences in the creative sector — performing, visual arts, video games, film, interactive narrative etc. As more and more interactive technologies are employed to involve the audiences in all steps of the creation process, from audience journeys to models of co-creation, the value of the design process itself has become central to achieving audience engagement. However, knowledge of methods and process for designing and evaluating audience engagement remains fragmented and incomplete.

Acknowledging this lack of a coherent framework, this first workshop on Designing for Audience Engagement took an interdisciplinary approach to identify design strategies for audience engagement. The authors' contributions cover a broad spectrum of audience types and related industries.

What are audiences for? Before stating the discussion about audience engagement it is necessary to understand the different types of audiences and their relationship to their respective industries. The first paper by Coyne addresses this need.

Salgado discusses breakdowns in participation focusing on the museum community and Yiannoutsou et al present practical examples of engaging museum audience through game design.

McMeel and Nasibova discuss the participation of audience in performances, and Dima describes an example of a theatre audience journey through mobile phone-mediated storytelling. Wright focuses on the variety of playful engagement through mobile phone apps.

Derboven et al propose design guidelines for limited engagement and Morandell et al present their case study of engaging elderly people through theatre. Evaluation of engagement is an important dimension that is still at a novel stage of research. Monsen presents a mixed method of evaluating audience responses.

The outcomes of the workshop have been summarized in the infographic document on page (iii). The infographic acts as a contents page with links to the authors' papers. Hopefully this publication of the workshop proceedings will serve to stimulate further debate on designing for audience engagement.

Mariza Dima, Richard Coyne, and Mark Wright

December 2012

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What Are Audiences For?

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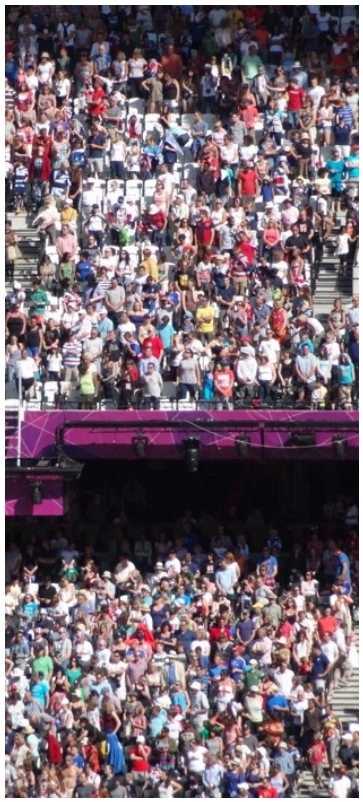

Abstract
In this speculative paper, I present the case that social media amplify the concept of the audience in the professions, and how this changes the way organizations think of themselves, introducing concepts of participation, empathy, entertainment, risk and the audience function.

Author Keywords
Audience engagement; design; *theoria*

ACM Classification Keywords
H.5.2. User interfaces: User-centered design

General Terms
Human Factors

Introduction
Many businesses think social media help them develop rapport with customers and clients [1]. In what follows I consider the role of the professional in this context. Audience engagement entails concepts of participation, empathy and entertainment.

Participation
The word "audience" pertains to listening (*audio*). The word "theatre" is more about viewing (derived from *theōria* in ancient Greek). In Greek a *theoros* was a

theatre-goer, a spectator, but scholars indicate that the *theoros* is also the one who leaves town to participate in rituals and festivals in another place and verify the claims made of them — not just by viewing festivals but by participation. According to S. Goldhill, "Each citizen becomes not merely a spectator but a participant in a ritual, festival occasion" ([2, p.168]). The *theoros* is this kind of engaged witness, a sacred ambassador, and hence a participant in political life.

Participating and reporting back are therefore important functions of theatre audiences. This participation does not necessarily mean getting up on the stage, but that engaging with, talking about, sharing, judging and interpreting is a vital part of the theatrical event.

According to Goldhill, *theoria* also entails "the idea of exploring the world through travel and informed looking" (p.168), and this is the term Plato uses to describe what we now mean by *theorizing*, i.e. accessing or establishing principles. Plato recruits the audience function in his allegory of the cave. The function of philosophers, prophets and seers is to bear witness to the truth.

What does this definition of theory (as engaged reportage) have to say about audiences in the age of the Internet? Audiences are the most *theoros*-like, or "theoretical" when they participate fully in the performance (if not on stage then as an engaged audience member), and then interacting with other audiences through retelling, reportage, and witness.

Empathy

Aristotle also offered advice relevant to audience engagement [3]. To persuade an audience requires you to understand their emotional condition, to know how they are feeling. Know your audience and present to them accordingly. For Aristotle this emotional orientation involves being "disposed in a certain way" — the speaker to the audience, and the audience towards the speaker. Latch on to the mood of the crowd. Get the mood right and the job of persuasion is almost done.

If this were a business manual, I would overstate the case thus: put your efforts into mood management and the solutions will follow. But managing moods is a complex, difficult, subtle and contingent process. Mood management focuses on *esprit de corps*, solidarity, and communities rather than individuals. If you get the mood right then you've almost solved the problem. The audience is already persuaded. The team is motivated and near to the solution. The rest is easy.

Business-oriented weblog authors are ready to offer advice in these terms. Enter "why blog" into your search engine. The answers invariably invoke concepts of building community, putting a human face on your brand, sharing, picking up on customer mood. Concepts such as smart mobs and crowd-sourced creativity rely for their power on mood management.

Entertainment and Risk

In an interesting essay of 2002 on entertainment and the Internet, film theorist Richard Dyer noted how entertainment was even then fusing with everyday communications channels, particularly via the Internet [4]. The earliest forms of this fusion were sonic, in particular the use of background music and radio broadcasts that we might expect to hear anywhere and at any time. Then came personal stereos. Now the

visual aspects of entertainment are ubiquitous as well: "television, video and the internet are visual as well as audio media that are also in the home, permanently available, that you can take about with you and access at any time" (p.176).

So entertainment is no longer apart from the rest of life, at least not spatially and temporally. Neither is it constrained to professional production, but can be co-produced, crowd-sourced and user-generated.

Audiences are there to be entertained. But there are entailments to seeing yourself as an entertainer and risks for the professional.

- The entertainer is a juggler of emotions. Aristotle says as much of the rhetorician. You have to gauge the mood of the audience, and in turn project the right mood. For the classical tradition, any discipline so dependent on the emotions for its *raison d'être* is suspect. Emotions can sway either way. The entertainer has to be prepared for derision as well as applause.

- Entertainment carries with it the trappings of class. Society places a great premium on entertainers who fit the bill, and some are very well remunerated. For most it's badly paid. Though we may admire and even envy the entertainer's abilities, stories about entertainers place them on the margins of society. Even those who are rich and famous pay the price by giving up their privacy and dignity — e.g. secret photographs of female royalty.

- As depicted in Sylvain Chomet's (and Jacques Tatti's) animated film *The Illusionist* (2010) entertainment is closely associated with pathos, dashed dreams, derision, and playing the fool. Drag acts seem to play on comic-tragedy, and audiences do enjoy sad stories about entertainers: *A Star is Born* (1954); *The Entertainer* (1960).

- Entertainer" is sometimes a euphemism for someone in the sex business, or at least someone who is "available." According to Dyer, "To watch an action movie is to sink back in the seat and say, 'show me a good time.'"(p.68)

- Though they are in the public eye, some people really don't want to be mistaken for entertainers, and prefer to be "taken seriously": journalists, educators, activists, politicians, critics, coaches, guides, sportspeople, and bishops.

It's interesting and somewhat jarring, when entertainers turn into politicians, activists and public intellectuals. But it's just a role after all, like delivering information, or a challenge.

Audience Functions

Designers used to think they were just providing for clients and users. Thanks to social media it's now acceptable to borrow from other professions and think in terms of audiences. Like publishers, games companies, broadcasters, performers and artists, designers need audiences, and in large numbers.

- Audiences as consumers function to provide a direct revenue stream: the bigger the audience the greater the income.

- In the publishing, academic and heritage arenas large audiences (big classes, lots of readers and visitors, many citations) equate to recognition, esteem, success, and "impact" in some measure, which helps the case for funding.

- Audiences feature in overall dissemination strategies. In the age of the Internet they provide a pool of potential investors, as in the case of social media crowd-funding via online services such as Kickstarter.com.

- Audiences can be mobilised to grow themselves. They can also be enlisted to provide feedback, ideas and enhance product quality. Audiences help enhance, develop and spread the ethos of a brand.

- Audiences form into communities, and communities within communities. Thinking of online forums for games and apps, audiences also trouble shoot and solve problems. Audience members help one another.

- Audiences can contribute ideas, designs and media content, thereby contributing to overall product development. In online media such as YouTube, audiences (as consumers) and producers elide, as *prosumers*.

It seems that social media contribute to audience engagement, facilitating the creation of communities for social and commercial ends. There are many examples of innovation in the area, much led by the music business.

Conclusion

This short paper was compiled from a series of regular blogs by the author. The initial blog bore the title of this paper [5], and was followed by 29 comments, admittedly from a captive audience, mostly students of sound design and digital media, some of whom are trying to make a living out of music. Their comments fed into my thinking, and three subsequent posts, which are also incorporated into this paper. So, blog-based audience engagement does have an effect on the production of texts. Whether it also helps people make a living out of the design of material things, or of music, is an interesting research question. According to one commenter: "Play because you like playing. It's art. If others dig it – even better."

Acknowledgements

This work is supported by a grant from the Scottish Funding Council under the project title *Moving Targets*.

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Evaluating Touch Screen Design for Limited Audience Engagement

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Abstract
In this position paper, we outline the evaluation of an on-going project at the Antwerp Zoo: an educational multi-touch screen installed in the ape house. Designed to offer educational information to Zoo visitors, it was important for the multi-touch screen to appeal to visitors to initiate interaction, while not being intrusive: the visitors' main focus had to remain on the animals themselves. Therefore, a limited audience engagement was appropriate. Preliminary evaluation results indicate that while the design for limited engagement was successful, it did interfere with other design goals, such as stimulating user collaboration.

Author Keywords
Audience engagement, multi-touch, evaluation, visitor Studies

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

Introduction
Audience engagement is a central concern for the creative sector at large (arts, film, literature, etc.). With the increasing proliferation of technology use in all aspects of daily life, including entertainment, engagement is becoming a central concern in the

Figure 1. Chimp and touch screen waiting for visitors

Figure 2. Multi-user visitor Interaction at the Zoo touch screen

design of digital technology as well [3]: it can be thought of as a measure for how much audiences like the content they are watching or interacting with. Products and experiences are often designed to be maximally appealing, drawing in and engaging their users as much as possible.

This position paper takes a somewhat different perspective on user engagement. In the Antwerp Zoo (Belgium), an educational multi-touch wall was installed in the ape house to allow Zoo visitors to learn more about chimpanzees. While the multi-touch wall needed to be attractive enough to appeal to visitors, and spark their curiosity to learn more about the apes, it was equally important to avoid making the wall *too* intrusive, leading attention away from the animals themselves (see figure 1).

To evaluate the use of the touch screen, a mixed method approach was applied. Qualitative user experience (UX) research methods (observations and interviews) were combined with quantitative research methods from visitor studies [4, 5] (quantifying the time spent at the touch screen).

Touchscreen Design

In order to better understand the context in which the evaluation of the touch screen took place, we first outline the design of the touch screen. From the very start of the design process of the touch screen, audience engagement was a key factor to be dealt with. The design of the touch screen had to take into account several factors. While the touch screen had to be attractive for Zoo visitors and had to spark their curiosity, it was crucial to avoid visitors monopolizing the touch screen for long periods of time [1].

Furthermore, the design had to take into account multiuser interaction (see figure 2) and even stimulate visitor collaboration, and offer a layered experience of several information types. The final design consists of several interactive elements:

- In the centre of the touch screen, a short quiz is available. The quiz consists of a random set of three short questions about apes: visitors can answer the questions by dragging bananas from the bottom of the screen to the answer they choose (see figure 2).

- When the quiz is not being used, the central part of the screen shows a screensaver, on which some facts about the chimps in the Antwerp Zoo can be consulted (see figure 1). A 'Start quiz' button is in the middle of the screen.

- In sidebars, short educational movies about typical chimp behaviour and their environment in the Zoo are available (see figure 1).

Evaluation

For evaluation of the multi-touch screen, we used a mixed-methods approach of qualitative user experience (UX) evaluation and quantitative visitor studies. In the next paragraphs, we describe the research setup. As the project is still in progress, no final results are available at the time of writing. However, at the time of the workshop, most results will be available.

UX Evaluation

For the UX evaluation, we used a combination of visitor observation and interviewing. Visitor observation provided information about the primary users of the touch screen, how they approach the screen, and if

Figure 3. Visitors gathering in front of the touch screen. Pictures taken using time lapse photography

visitors collaborate or not. Specifically, we draw upon the public screen zones described in [2] to check if the zone division between *peripheral awareness activities* (no screen-related activities), *focal awareness activities* (socializing activities associated with the display), and *direct interaction activities* is transferrable to the multiuser multi-touch setup in the Zoo.

The observations were conducted by unobtrusively watching and listening to users from a distance. To support these observations, we used a Vicon Revue camera for time-lapse photography (see figure 3) to obtain pictures of people gathering in front of the touch screen. These photographs gave us additional information on how people gather in front of the touch screen. The short interviews provided information on the visitors' experiences using the screen, and provide some details on why non-users pass in front of the touch screen without using it.

Visitor Studies

The qualitative UX evaluation methods are complemented with quantitative methods drawn from visitor studies [4, 5]. Visitor studies are often used to evaluate the effects of different types of information carriers on visitors in public spaces such as museums and zoos. In the Zoo study, we focused the use of these quantitative methods on two main aspects: quantifying and breaking down the time spent in the relevant area of the Zoo (ape building), and assessing what people remembered from their visit to the ape building. These studies are performed both *before* and *after* the touch screen was installed: this allows for a thorough analysis of the effects of the touch screen on the way people visit the ape building.

Preliminary Results

While the data is still being processed at the time of writing, there are some preliminary, qualitative results.

Public screen zones.

The public screen zones presented by Brignull and Rogers [2] seem to be confirmed in our study. Besides active interaction and mere peripheral awareness, *focal awareness activities* were observed when parents were watching their children play without interacting themselves, and when other groups of Zoo visitors were 'queuing up', to wait their turn to interact with the screen. In these cases, non-users were actively watching or talking about the contents of the touch screen.

Collaborative use.

Observations of the touchscreen showed that children in particular are very much drawn to the touchscreen, starting to interact with it without any bias. They often involve their parents in the interaction, who read the questions to them, or join them in playing the quiz. While children randomly jump in with other kids, marvelling at the touch screen, using it more for the sake of the interaction itself than for the quiz, adults are more reserved about collaborating with strangers.

Limited engagement.

Initial results indicate that the design for short, limited engagement seemed to be successful. However, the success of this limited engagement also had its implications for other aspects of the touch screen usage.

To stimulate short interactions, the design is dominated by the quiz format. During the design phase, a quiz format was considered a good fit for the intended short, limited interactions. In contrast, an 'open' system allowing users to search for information by themselves would enable users to monopolize the touch screen for extended periods of time. While the results indicate that the quiz format indeed does provide these short interactions, the format does not encourage users to interact. These users seem embarrassed to play a quiz in a public place, or do not want to be seen playing a quiz they think is intended primarily for children and teenagers.

Generally, users of the touch screen play one or two quizzes before leaving the touch screen to other users. User interactions are thus quite short, although some children do convince their parents to play three or four times. Having the majority of the users interacting with the screen for only a few minutes, however, other visitors waited their turn to interact with the screen, instead of collaborating. While adults are not very eager to collaborate with strangers in the first place, the short nature of the interaction further enhances the tendency to wait for their turn. Therefore, due to this short interaction, user groups effectively monopolize the quiz – not consciously, and for only short periods of time. In this sense, the limited engagement makes it difficult to engage more users at the same time and have them collaborate. While the design succeeds at limiting the user engagement to a few minutes, the same design choices limit user collaboration, especially among adult users.

Discussion and conclusion

While the quantitative study results will probably put the qualitative ones in a larger perspective, the preliminary results discussed above indicate that the limited engagement approach used in the touch screen design was successful. However, the results also show that the design choices stimulating this limited engagement also interfere with other design goals such as collaboration. While specific design goals vary from product to product, and from application to application, engagement is a design goal common to various technology designs. Therefore, it can be interesting to explore various engagement strategies, and analyse whether and how they interfere with other design goals. Ultimately, structured knowledge about this influence might help designers decide on which engagement strategy to use in which specific situations. The preliminary results of the current Zoo study are significant, in that they point to this trade off: what exactly is the significance of 'engaging' interaction, and how does this relate to other design aspects? This intricate balance is an interesting topic for further discussion and research.

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Mobile stories: Motivating theatre audiences through interactive storytelling

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Abstract
In this paper I present the conceptualization and implementation of a digital media project for engaging theatre audiences. Activities specially designed to motivate the audience were employed to involve audience members in a participatory interactive experience. Mobile applications were the technological means towards the end-goal, to create a short story around a specific theatrical play which was about to be staged. The project was used to investigate forms of motivating audiences and to extract insights valuable to the design for audience engagement. The project was part of Moving Targets, a research project on developing models for audience engagement in the Scottish creative industries.

Author Keywords
Theatre, audience engagement, mobile apps, design

ACM Classification Keywords
H.5.2. User interfaces: User-centered design

Introduction
This project was initiated with the aspiration to create a collaborative space between the theatre production team, the theatre artists and the audience and to

investigate the creation of a meaningful relation between them. In order to create this space, I sought to bring the audience closer to the production process of a theatrical play. Theatres have a long tradition of emotionally engaging their audiences, however, they have for a long time considered them as passive spectators. Movements such as Experimental theatre in the late 19th century shifted this norm and sought to create a more active relation with the audience by involving them in the theatrical play in numerous ways. With the advent of new media, the interaction space between the theatre artists and the audience was significantly broadened. Companies such as Rimini Protokoll [5], Make Shift [3] and Blast theory [1] are great examples of contemporary experimental theatre using interactive media and the internet.

In Mobile Stories I sought to practically investigate the establishment of a collaborative relation between theatre and theatre audiences through participation. The audience did not participate in the actual play but collaborated with the theatre team to produce content related to the play which was broadcasted before the play's premiere. The process of inviting the audience to contribute content allowed me to explore, among other aspects, identity and ownership as forms of motivation.

Research phase

I collaborated with Ankur Theatre Productions, Scotland's foremost black and ethnic minority theatre company, which at the time of the project was about to begin the production of a play entitled Mwana, written by Tawona Sitholé. The exploration of how to design for engaging the theatre audience began with a background research of the issues and opportunities theatre companies face nowadays in terms of making and maintaining an audience. I worked for ten days at the offices of Ankur Productions, a period which I spend discussing with the artistic director, artists and designers that collaborate with the company as well as its marketing officer. I also participated with all the above groups in a development workshop that aimed at defining the future strategies for the company and at a storytelling contest organized by the company for the local community.

Design process

Through my research, which was significantly supported through my involvement in the development workshop, I identified the following challenges:

- Theatres always look for innovative and entertaining ways to engage and connect with their audiences.

- Organizing events around a particular production is a nice interactive addition to its promotion. These can be made across art forms involving poetry, the spoken word, acting and animation.

- New technologies offer immense potential but their use in theatre environments is limited.

- Considering the social outreach of the theatre company, it is difficult to infiltrate communities, especially ethnic minorities, so ideas that bring people together are of high priority. This issue can be approached by offering activities to connect people, to educate them through participation and network at the same time the artists involved.

- It benefits both the theatre and the audiences to move towards cross media productions such as book publication of theatrical productions.

Drawing on these points, and considering the creative potential of the theatre audience, I used the artistic dynamism of storytelling to motivate the audience of Ankur Productions and enable a participatory experience for them, the artists involved and the theatre team. The idea of using the art of storytelling was inspired by the storytelling contest which I attended during the research phase.

A blurb inviting people to participate in the project was sent to the theatre's mailing list and its social media channels. Selected members were invited to create a story using material gathered with their smart phone. The selected audience were called to study the underpinning political, social and cultural elements that subsumed the central story and think of how they would use them in their own narrative. The audience met over a couple of weeks. The first meeting was an introduction to the plethora of mobile phone applications available to enable them to capture material for their story. They were exposed to applications for gathering audiovisual material, social media messages as well as Augmented Reality. In addition, they were consulted towards the software they can use to create their story, from simple video editing software to online tools such as Storify [6]. They were also given the script of the play to read at their own leisure. The activities that aimed to connect the audience and the artists consisted of a walking tour together with the playwright and an invitation to attend the rehearsals. The audience joined Sitholé in a walking tour to explore the protagonist's city, discussing the various aspects of the play's characters and the places and objects that were important to the story. In addition, they attended the rehearsals in order to meet the actors as well as to discover more about the story and about the production process of creating a main stage play. During these activities they used mobile applications to collect material that would build up their story. A Facebook page was created to further enhance the interaction among them [2]. The page served as a basis for exchanging feedback and ideas, share material in different art forms and keeping a log of the group's activity. Sitholé was actively participating in this online dialogue. Finally, all participants decided to assemble their gathered material in a short video and they were able to consult both me and Sitholé prior to the digital distribution of the project. Their videos were uploaded in a YouTube channel [4] and were distributed over the internet through various social media one week before the play's premiere in Glasgow.

Connect

The project connected the three protagonists of the theatre experience: the audience, the artists and the producers, and demonstrated how a meaningful relationship between them can be established. The audience members enjoyed the interaction with the playwright and with the theatre team during the rehearsals. Sitholé described the invaluable experience of the walking tour which gave him the opportunity to revisit and reflect on the personality and character of the protagonist. He also found the story making process and the interaction through the Facebook page engaging as he could view the re-creation of his own characters from different perspectives. Equally, the theatre team embraced the works of the audience and the new creative space that was formed and discussed

future strategies for involving audiences in similar creative ways. One potential path they envisaged was to use the stories as the basis for a new play, created entirely by the audience. Another aspect of the project they found fruitful was the strategic dissemination of the artistic work of the audience as a marketing tool for the play.

Identity and ownership

The project exemplified the dynamism of identity and ownership as motivational aspects for creative engagement. This did not happen only through their stories and the connection of the stories with the main play but also through the interaction with the playwright, the actors and the theatre team. Some members of the audience described how the whole experience triggered a sense of ownership over the play as its narrative blended with the individual stories.

Creative engagement

The project demonstrated the importance of creativity-induced motivation. The audience was enthusiastic about the adventurous goal of making their own story. They felt that they were given an opportunity to contribute to the theatre with their own creative abilities. Some of them thought of the stories as a way of creating a mosaic of different parts of the story that added up to the whole narrative. They thought that this process gave them a better understanding and a more situated view of the play which, as mere 'consumers', would not have the chance to experience.

In addition, the audience was eager to experiment with different technologies, even though they did not use some of them. The dialogue among the members of the audience was further enhanced by the fact that each member had a different background and contributed different perspectives. This was reflected in the exchanges between them as well as in their final stories.

Future directions

One of the aspirations of the project was to use the stories created by the audience to promote the play. The impact that the stories had in attracting audiences in that aspect was not explored in depth. Google analytics revealed an international audience who watched the stories, the majority of whom were from the UK. However, I did not employ any methods for evaluating how many of the audience that attended the premiere and the consequent performances attended because they had watched the stories online. Confirming or refuting the stories' success as a promotion tool, as well as contributing methods for this evaluation, remains input for further research. In addition, this project involved a small number of audience members. It is, therefore, important to consider how the extracted insights can be applied to larger audiences. Such modifications can lead to exciting outcomes, inspirations and fruitful ideas.

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Disrupting Rhythms: Breaking Passive Patterns of Audience Behaviour

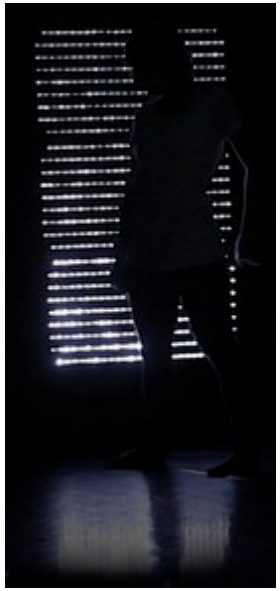

Figure 1. Act 1 of Divergence performance.

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Abstract
In this paper we will discuss divergence an event designed and performed at the University of Auckland that appropriates digital technology. We will use it as a test case to explore three emergent themes for challenging passive patterns of audience behavior, namely sensors, serious gaming, and social engagement.

Author Keywords
Performance, Dance, Design, Digital Media, Architecture.

ACM Classification Keywords
J.5. Arts and Humanities

General Terms
Measurement, Performance, Design, Experimentation, Human Factors, Theory.

Introduction
Divergence (http://youtu.be/o-5x95hjfLc) is the result of a cross-disciplinary course between Dance Studies and Architecture at the University of Auckland. It explores preconceptions of performance and spatial design in light of emergent technology through the design of a performance and performance space. As the architect and dancers explored the relationship between space and performance, the notion of synchronicity

emerged; technology or light as synchronizing the actions of men [1]. This in turn gave way to ideas around control, puppetry and eventually to the notion of avatars, gaming and interactions inspired by the writings of Jerzy Grotowski. However, the mirage of the next potential technological development initially created a situation that resulted in perpetual anticipation of the *new* version of the technology or performance space. This hindered development as dancers postponed engaging with the interim prototypes until realization occurred, creating a viscous cycle. Once overcome, spatial and performance design progressed in parallel and resulted in the deployment of a circuit of LED grids combined with activation pads. There was a second separate circuit of infrared activated LEDs, which provided another tool for the performers but also added contingency; if one circuit failed the other was separate and the performance could continue.

Divergence resulted in a live performance of three acts. Act one involved audience members activating the LED light panels by stepping on pressure sensors and a performer responding to the light with dance phrases. Act two was a performance conversation between two dancers each activated by lights. Act three was a game narrative with the audience controlling dancers through activating and deactivating lights; the audience members were competing through the performance. In the following section we will expand on acts one and three, bringing observational evidence to bear on the application of some of these techniques for audience engagement.

FIRST ACT: All in the game

Jane McGonigal [2] has written extensively on games and the extensive voluntary hours that are invested. For dedicated gamers playing—for example—'World of Warcraft,' time invested is comparable and can even surpass the compulsory hours an individual mightspend at work. McGonigal has gone on to unpick game psychology arguing that similar structures of challenge, reward and collaboration could be applied to real world situations. The *World Without Oil* serious game (http://worldwithoutoil.org/) is perhaps one of the more successful applications of this hypothesis to a real world condition. To return to the theme of audience participation, gaming also offers the potential of participation, play and collaboration. It disrupts the politics of passivity typically associated with being a spectator and provides a methodology for exploring a more dynamic condition generated between the performers and the spectators.

In this first act within *divergence* audience members were invited to activate lights within the performance space, with a dancer responding to this dynamic stage condition. Considerable rehearsal went into preparing performative *phrases* as the dancer had to improvise the relationships between consecutive parts as the live performance unfolded in the hands of three audience members. Although we might couch this in terms of a *game* it is perhaps interesting to conceive of this as blurring the distinction between instrument, performer, audience and composer/choreographer. The audience members activating the LED grids were at once spectators, choreographers and performers. The dancer might be conceived as part performer and part instrument.

Once the performance space was set up for the live performance it was possible to meditate on the potential to use spatial design to further blur the lines of audience/performance. However, what was also brought to centre stage was the potential to engage the audience both spatially and creatively. Much like gameplay they become the protagonists within a carefully designed environment, with a skilled performer ensuring—to some extent—a professional unfolding of the performance aesthetic and narrative.

Intermission: Sensors

A DJ *senses* the mood of his crowd; he tweaks and tunes his performance based on aural and visual feedback that suggests his audiences are engaged, indifferent or bored. Thus as sensing is already entangled in performance, electronic sensors offer additional layers for environmental metrics and spatial activation. We are seduced with the reactive and interactive architecture idealized in films like *Minority Report.* Yet, sensors—as we know them—within the built environment are usually involved in some prosaic causal chain; someone enters a bathroom and a light is activated, or my key-card comes in proximity to its RFiD reader and I am given access to a particular room. However, combined with serious gaming, sensors can blur the space between stage and auditorium and can be utilized to help audiences feel they have permission to engage.

In *divergence* the sensors went through a series of iterations that can be seen in the 'making of…' video link above. However there appeared to be an inverse correlation between the sophistication of the sensors and the potential for creativity. This was attributed to a number of factors, reliability, complexity to set up and the increasing time taken to calibrate the sensors to each new environment. It was after what we might refer to as a "cusp catastrophe" [3], and a return to basics that creative freedom was restored and the group began to understand Heidegger's exhortation that technology must be critiqued through art [4].

Ultimately it was not the technological sophistication of the performance space and sensors that enhanced the performance, rather it was the clear and critical framework informed by Grotowski. The sensors helped to spatially engage the audience, further disrupting the boundary between audience and performance.

LAST ACT: Social gaming

McGonigal's research revealed that although people liked to compete with real people and each other in games, with the advent of massive multiplayer online games it became apparent participants got more pleasure out of collaboration within a gaming environment. In the final "act" within *divergence*, the audience was given control of the performers in a game of cat and mouse, with a performer chasing light and another one creating obstructions. The notion of performance was challenged in the extreme as audience members blur the line between choreographer/observer/player about the game/performance unfolding at their fingertips.

This act was perhaps a more literal interpretation of the game than any of the previous acts. Little rehearsal was required and to the casual observer it appeared as a contact or combative sport more than a performance. Throughout divergence it was apparent the audience volunteers were continually becoming more comfortable with participation as the performance

unfolded. In this respect the final act was the most successful. It is unclear whether that was a result of the order or nature of the act; where the audience participants controlling the performers had no obligations to performance aesthetics. Also there was a social element, the two audience members were standing side-by-side and competing with each other through their dance avatars.

Summary

This test case briefly explored three methodologies for engaging audience members; serious gaming, sensors and social competition. While modest in scope it is a demonstration of some of the potentials to use spatial design, sensors and gaming strategy to blur some of the barriers that exist between the viewer and the viewed. The passive politics of spectator/performer can be traced back to medieval carnival [5]. It is perhaps overly simplistic to argue any single strategy would be a prescription for success in breaking such a strong and culturally engrained typology. Is any success we might attribute to *divergence* due to chance? Or the alignment of the three targeted strategies of serious games, sensors and social interaction? At the very least they warrant further scrutiny, so we can begin—with some certainly—to leverage their potential to engage audiences in new and meaningful ways.

Acknowledgments

The authors would like to thank the makers and performers. Architect – Kelly; Dancers – Maeling, Sam, Pauline, Nita, Kristie, Nicole, Catlin, Sophie.

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Mobile stories: Motivating theatre audiences through interactive storytelling

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Abstract
In this paper I present the conceptualization and implementation of a digital media project for engaging theatre audiences. Activities specially designed to motivate the audience were employed to involve audience members in a participatory interactive experience. Mobile applications were the technological means towards the end-goal, to create a short story around a specific theatrical play which was about to be staged. The project was used to investigate forms of motivating audiences and to extract insights valuable to the design for audience engagement. The project was part of Moving Targets, a research project on developing models for audience engagement in the Scottish creative industries.

Author Keywords
Theatre, audience engagement, mobile apps, design

ACM Classification Keywords
H.5.2. User interfaces: User-centered design

Introduction
This project was initiated with the aspiration to create a collaborative space between the theatre production team, the theatre artists and the audience and to

experiences and preliminary results from an exploratory six month project involving the design and evaluation of a geolocated audio guide. The system was designed as an interoperable web application using HTML5, JQuery Mobile, Google Maps and text-to-speech APIs. There are seventy stories about the local histories and recollections from residents in the Grange area of Edinburgh, Scotland. Stories are triggered in the field using a GPS-enabled smart phone. They can also be accessed using a normal computer by tapping map labels (figure 1).

The design of the system was informed and evaluated using a mixed methods approach. An early prototype was tested in an one hour informal focus group with eight adult learners. The reworked design was evaluated through an online survey based on the QUIS instrument. [1] The survey was completed by four postgraduate informatics students and fourteen members of a local conservation group. Moreover, a two hour field trial was conducted with two participants, also from the conservation group. Additionally, analysis of logged user interactions with the system was undertaken. This is the main method used to estimate audience engagement and will now be discussed.

Recording remote user behaviour

Measuring audience engagement on the Internet can be traced back to the web counter and web server log. Whilst a counter is simple and rather uninformative, the basic idea can be extended to become more useful. A custom logging system was integrated into the audio guide to record specific types of information at given intervals and when certain events are triggered.

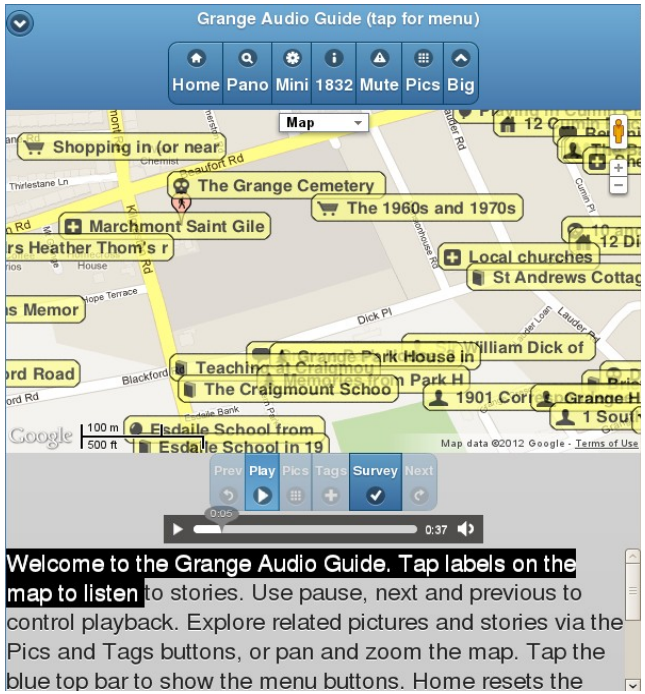

Figure 1. Screen-shot of the Grange Audio Guide. Stories are plotted as labels on the map. By walking near a story or clicking on a label, the story text appears at the bottom and is read aloud. Story and audio controls are positioned above the text. The menu bar above the map contains features such as historic map overlays and crowd-sourced pictures. The user interface adapts dynamically to different resolutions and aspect ratios for maximum interoperability across devices and browsers.

Table 1 describes the main types of recorded data. The logger works by generating a session identifier each time the application is loaded. User actions, such as clicks or taps, are then saved against this ID and a time stamp.

	Description
Mouse clicks or taps	Depending on device used, either a mouse click or touch screen event is recorded. Cursor or finger position, as well as which (DOM) element of the page or button was clicked is also saved.
Stories	Initiated stories, parts loaded, stories finished and story identifier number are recorded.
Page events	Life cycle events such as page initialisation, finished loading, refreshed or closed are stored.

Table 1. Summary of variables recorded in the action log.

Email invitations to evaluate the audio guide were sent out to an estimated 200 Masters and PhD informatics students at the University of Edinburgh and to 180 members of a local conservation group. Participants were instructed to explore the system for as long as they wanted using a recent web browser, and then complete an online survey. Participants' survey answers were associated with the session ID, allowing responses to be compared against the logged behaviour. This enabled cross-validation of self-reported answers.

Between 25 July and 3 August 2012 a total of 45 unique sessions were registered. The sessions fall into three categories. Evaluated sessions (1) are when participants engage with the application, such as listening to stories, and then submit the evaluation survey. Unevaluated sessions (2) are when participants engage with the application, but fail to evaluate the application before exiting. Bounce sessions (3) are when participants exit directly or shortly after opening the application without any engagement.

	Evaluated	Unevaluated	Bounce	Total
Count	18	17	10	45
Total duration	2hrs 40mins	2hrs 18mins	5mins 30secs	5hrs 40mins
Maximum session	32mins 30secs	23mins	1min 12secs	-
Average session	6mins 22secs	7mins	32secs	-
Minimum session	1min 30secs	1min 10secs	1sec	-
St.Dev session	7mins 46secs	7mins 34secs	30secs	-

Table 2. Session durations by type of session.

Intensity of audience engagement

Instructions to participants did not specify a time limit for exploring the system. Therefore, an important indicator of audience engagement is simply the amount of time someone interacts with the system before they close the application. The log suggests an aggregate interaction time of approximately five hours and 40 minutes across all participants (see table 2).

Excluding bounces, individual sessions lasted on average 6-7 minutes. However a large amount of variation between maximum and minimum interaction times is notable. On average, users affiliated with the local conservation group interacted longer with the system than the students who had no clear link to the

Grange area. Further research is necessary to identify audience segments, as audiences are not homogeneous and different people are interested in different kind of content.

Content analysis

When the application runs on a device without a GPS, as was the case for this data, the map location is set to the center of the geocoded data points biasing potentially the story selection. A core challenge then is working out what stories are most engaging, and whether content browsing follows a pattern. This was estimated by the number of times a story was initiated, divided over the number of times the first part of the story was listened to completion (table 3). The results suggest that the initial map location did not influence story choices, as there was a geographical spread, and some of the most popular stories are outside the bounds of the initial map.

Interface design and feature analysis

Audience engagement can be further probed by studying the features users explore. The frequency of button presses are presented in table 4. This is valuable for understanding how audiences interact with the user interface and which features of the application were most and least used. The results suggest that most users did not explore the application deeply, perhaps as a consequence of poor user interface design or time constraints. Additionally, the frequency of use of the audio controls and "next" button suggests these could be made more prominent and intuitive in the future.

Story title	Story started	Part 1 completed	Index
The Grange Cemetery, the Southern Cemetery	10	4	0.4
Astley Ainslie Hospital	10	4	0.4
Carlton Cricket Club in 1960s	12	3	0.36
1930s schools at Craigmount and George Watsons	8	3	0.24
Esdaile School in 1946	7	3	0.21

Table 3. The five most initiated and listened to stories.

Clicks	Button	Description of action
117	Next	Loads the next part of the story
72	Pause/play/rewind	Controls audio playback
49	Menu	Toggles the menu buttons
26	Survey	Opens the online survey
21	Previous	Skips to previous story part
17	Panorama	Opens a Google street view
13	Tags	Lists story tags to filters on
10	Map photos	Overlays geolocated images
9	1832	Toggles historic map overlay
8	Home; Mute	Resets the map and repeats instructions; Disables audio

Table 4. The most clicked buttons of the user interface.

Discussion

Analysis of logged remote user behaviour is useful for understanding audience engagement in several ways. It can shine a light on the nature and intensity of audience engagement, audience segmentation and interest in competing content and system features. Moreover it is an inexpensive and relatively easy to use method. By enabling analysis of remotely situated audiences, this approach can be applied to a larger number of participants without the need for lab-based trials. Furthermore the technique can potentially increase ecological validity [2, p. 438] of studies because content consumption happens in a realistic environment rather than the lab. This is particularly important for web applications which target multiple devices and which is not possible to test exhaustively in the lab due to device fragmentation.

However, there are challenges with this approach. Tracking individual user sessions is hard since the hypertext transfer protocol (HTTP) is stateless. This was overcome through session IDs, but required some manual data processing. Moreover, making sense of the data is time consuming and interpretation without prior baselines is challenging. This could perhaps be resolved by adopting A/B testing where multiple contrasting designs are compared against each other [3]. Moreover, there are good reasons why the study used a mixed methods approach. It is hard to operationalise dimensions of audience engagement. Thus it is easy to misinterpret the numbers without probing deeper into the user experience through qualitative methods. In particular, the data from the action log is far less rich compared to the focus group and field trial.

Summary

Consumers of technology are increasingly used to beta software, and analysis of remote users' behaviours could fit well into the agile strategy of publishing software early and often. In this way the design could evolve based on users' behaviour as the software is adopted. This sits well with the idea of open innovation where users play a key role throughout the continuous innovation process [c.f 4]. Returning to the question of how to tell when designers have captivated their audience, the analysis of logged remote user behaviour can quantitatively evidence audience engagement in the form of interaction time, popularity of various contents and application features. Although this was only an exploratory study with a small sample, the methods can be applied to larger projects.

Furthermore, it has potential to inform the design process, and may be used as formative feedback in the design process. The Internet is already the new test lab and designers would do well in further exploring logged user behaviour, alongside established qualitative methods, to better understand audience engagement.

Acknowledgments

The author would like to acknowledge support and contributions from AHRC, ECA PRE fund, Prof. Jon Oberlander, Dr. Mariza Dima and Prof. Simon Biggs.

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TheatrAAL – Using Theatre-Workshops to Involve Older Adults in Research in the Field of Ambient Assisted Living

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Abstract
How to involve older adults in research and development of ICT? How to discuss basic concepts and ideas that are not implemented yet? Theatre performances can bring those ideas alive. Within the project TheatrAAL six workshops with two groups of older adults were organized discussing ideas of Ambient Assisted Living by involving the participants stepwise in developing new theatre-scenes. This was and is a challenge for both scientists and artists to combine their methods and develop a new methodology.

Author Keywords
Ambient Assisted Living, Assistive Technology, User Involvement, Theatre, Creative Writing

ACM Classification Keywords
H.1.2 Human Factors, H.1.m Miscellaneous

General Terms
Experimentation, Human Factors

Introduction
Ambient Assisted Living (AAL) aims to create better conditions of life for the older adults in Europe through the use of information and communication technology (ICT) [1]. Continuous user involvement in the R&D

activities is seen as crucial for all activities in this field. Describing the idea of a research project and especially the potential benefits for users that are not familiar with current developments is often a very complex task, especially in the early stages when no prototypes or other concrete devices are available. The idea of using theatre performances has been already applied at the School of Computing at Dundee by M. Morgan and A.F. Newell [2], [3].

Within an earlier project different forms of workshops were tried out with different target groups of AAL. The theatre-approach described in this paper was applied by the AIT-team for elderly people discussing possible ethical problems of using ICT, in particular social networks. As this single workshop did not allow a detailed analysis on how deep the target group can be involved in the theatre approach, the project TheatrAAL was started.

The Project TheatrAAL

The objectives of the project were

· To learn more about applying theatre methods to the R&D field of innovative ICT Products

· To find methods in order to involve older adults in different stages and styles of theatre-performances (enabler – barriers)

· To see how ideas, requirements, wishes, concerns and different points of view on new developments can be presented and discussed in a such a setting

· Find differences between different target groups (rural vs. urban area)

· Get new ideas for the AAL research

· Promote the ideas of AAL

Two groups (one in the countryside, one in a city) could be recruited to participate for 3 workshops each. The first three workshops were organized in the countryside, the second three in the city.

The three Workshops covered the following topics:

· ICT based social interaction

· Life Style Management

· Tele-Care

Organization of the workshops

Participants of the two groups were contacted through organizations. Information material and an informed consent form were given to participants prior to the workshops. The workshops were video recorded to allow further analysis.

Workshop Group 1 – Countryside: 13 women, aged 65-75. They know each other and met regularly in order to carry out different activities that helped them stay physically and cognitively fit. Some of them needed assistance and care. Most of them had experience in care giving for relatives. The group was heterogeneous, initially reserved but open to the project itself.

Workshop Group 2 – City: 13 women, aged 45 – 55. Only some of them knew each other from different course activities. The group was very thorough and critical but open to discussions.

Workshop methods

Since the aim was to involve the participants in creative work, suitable methods were selected. As the participants were not experienced in neither the field of theatre-work nor workshops, a step-by-step process was adopted.

· Passive interaction: The audience can give instructions regarding the aspects of a scene which need to be changed (characteristics of figures and relations, incidents, course of the scene, etc.)

· Creative Writing: Based on methods like brainstorming, thematic clustering, mind mapping and others, text-blocks are created fostering connectivity between scientific and artistic relations.

· Reading Aloud: Can be seen as a pre-step to roleplaying. Especially for people who are shy or do not like to be actors, reading aloud is connected with less barriers. Stepwise the participants can be led to present the text without reading – enabling them to bring more personality into the created scene.

· If the group is ready for it, with some assistance from the experts, playing the created text blocks can highlight the topics discussed before.

Workshop 1 – introduction-Scene and Passive Interaction

After welcoming and a general overview on the project, the theatre group (2 actors, 1 director) performed an introduction scene:

An elderly couple (Rudi and Maria) moved into a new home recently. They used modern technologies and were just preparing for a traditional thanksgiving turkey meal, together with their daughter in America – via videoconference.

Within this scene different topics were addressed (Problems with ICT usage, gender aspects, accessibility and usability issues, communication barriers, generation gap, etc.). After a short general discussion, the group was split up to discuss certain topics and to collect suggestions on how the scene could be changed. These ideas were collected and the actors played parts of the scene again to see how changes worked out (like Rudi should be more open to technology, technology should be described in a readable way in the mother tongue, etc.).

Both of the groups liked the humorous introduction and participated in the discussions. Many different ideas for changes of the scenes were brought up. The introduction scene provided a lively basis and the opportunity to hint specific points when discussing a topic.

Workshop 2: Creative Writing

In fact, it was planned to invite the participants to play themselves in the second workshop. This idea was postponed since the group did not seem to be ready for this yet. To provide a concrete topic for discussion, an

actual project idea on developing an "intelligent walker" including an attached tablet-PC for active elderly for indoor and outdoor mobility was used as a basis. The use of this device was put into an introductory scene, where the features of the new device were explained. This was followed by a clustering of different application fields (in particular, on the lifestyle management). Based on the information from the clustering, small groups were formed and asked to write their own new short scene on this topic, including the assistance of the theatre group (genre, persons, where, what should happen in the end etc.) just with some basic sentences or like a scene draft for an improvisation. These scenes where then improvised by the professional actors. After each scene the participants were requested to answer two questions on the topic of the scene.

Both groups quickly understood the features and possibilities of the new device, even though they did not know very much about ICT based lifestyle management. This showed that representing an idea with theatre methods can help the understanding of new topics.

The process of creative writing was initially not easy, but, with the assistance of the actors, a good framework on how to proceed and which questions to answer was given. Using this method the participants could create scenes in various genres ranging from common TV crime and comedy to science fiction (2020 meets 2040, Interviews, etc.). Already the active writing showed that the participants discussed the topics in a lively way. They enjoyed viewing the scenes they had written themselves.

Workshop 3 - performing

The third workshop had the objective to discuss the topic of tele-care and to see how far the participants can get involved into performing themselves. After some icebreakers (games), a thematic clustering was performed on tele-care. Those topics were then used again as input for the creative writing process where an innovative product should lead to a miracle in the scene. Great ideas came up, like a power-cap that reads thoughts and helps people with physical limitations. Another idea was a tool that helps to make decisions in difficult situations.

Group 1 (countryside) was very reserved concerning performing. Thus, they were asked to read the created scene aloud, with several iterations, using less and less the written text. This worked out well and brought up new concerns about technologies and services.

Group 2 (city) was very eager to perform and enjoyed it very much. They made very lively performances and raised great ideas of future ICT applications and possible features.

Conclusion

The project showed that theatre methods, such as passive interaction, creative writing, reading aloud and active performing can really contribute to discussions of complex and unknown topics. The feedback from the participants was very positive with them saying that they would participate again in a project like this. Especially workshop 2, where the walker was discussed, showed that this method can be used in the early stages of R&D developments in order to find out barriers, enablers and potential additional features.

Acknowledgements

The project TheatrAAL was funded by the benefit-Program of the Austrian Research Promotion Agency (FFG) and the bmvit.

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Engaging Audiences Through Social Media and Interactive Art

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Abstract

As contemporary individual gets exposed to continuously expanding flows of information, engaging her is becoming a challenging task that evokes increasing complexity of engagement mechanisms. Most of recent attention, however, is given particularly to media-based engagement, while more traditional methods are often underestimated and overlooked. This paper explores the potentials of both media and nonmedia approaches through discussing two opposite segments of the engagement spectrum: social media and interactive art. It opens by arguing the importance of engaging audiences as individuals and as communities. It continues by discussing social media engagement and interactive art engagement through examples of few global brands and two empirical studies. In conclusion, the paper compares these two approaches and suggests the significance and the potential of their interrelation.

Author Keywords

Engagement; social media; interactive art; individualism; collectivism

ACM Classification Keywords

H.5.m. Information interfaces and presentation: Miscellaneous

Introduction

Today, when the world is running at ever-accelerating pace people are exposed to larger flows of information than ever before in history. With this growing level of noise the societal role and the behaviour of an individual is shifting. Engaging this changing individual is becoming increasingly challenging and therefore new engagement mechanisms are explored and tested continuously. Recently more consideration is given to engagement mechanisms that are based on contemporary technological and media trends while alternative, non-media methods are often overlooked. In the scope of this work we look at two opposites within the ecosystem of engagement frameworks. We explore both media and non-media approaches on the premises of two examples: social media as massive online engager and interactive art as location-based engager.

We consider that it is crucial to look at these extremes in attempt to grasp the scope of engagement means in place for the extremely diverse and complicated audience of the 21st century. This audience complexity is a phenomenon that emerged over the past few decades. Hard to believe, but as recently as half a century ago television broadcasted only one or two channels. This broadcast acted as an enduring propaganda of values, beliefs and behaviours, as a "reliable" measuring scale for every occasion in life. Modern scene is different – people face endless choices of actions and opinions pressured by the severe weight of decision-making. Subsequently, the contemporary audience member no longer considers herself an obliged component of a gigantic societal mechanism, but an individual with unique and complicated set of qualities, interests and opinions. Being often an active member of a community or a group, she still perceives herself as a unique and different personality.

This individual would not listen to massive push advertising but form opinions based on her personal experiences and advices of trusted peers [5]. Struggling to decide between three different camera brands, she would hardly act on a stunning advertisement tagline but consult online discussion forums and friends. She would also expect products to be comprehensive and easy to use from the first moment and not tolerate if learning how to use them takes time.

Surprisingly, most of the products of contemporary market still belong to the latter category. These products behave as they were designed for anyone but a human being: they perform against expectations and speak foreign technological language. These design failures happen primarily due to lack of audience engagement.

Designs that fail

Working disconnected from the end-user, product developers fail to understand the true needs and behaviours of the audience and, thus, build products based on their personal professionally-biased point of view. There are far too many examples of such failing product designs, Flo TV being one of them. Flo TV emerged in 2007 when mobile hardware company Qualacom decided to sell more of it's gadgets by introducing mobile television service on a specifically dedicated device. The company invested $800 million into the service design setup without any attempt in engaging and understanding the target audience. As a result, due to dramatically low sales levels, Qualacom

was forced to discontinue the service shortly after the launch [2, 6].

Unfortunately, many areas that could truly benefit from audience engagement are following Flo TV's steps: most of IT, education, healthcare and other are in this category. Most of NGOs' designers in developing countries also work in one-direction. "I see a lot of design for developing countries instead of design in developing countries." notes Krista Donaldson in her article "Why to be Wary of "Design for Developing Countries". She also mentions that "Remote design (design from afar) and parachute design (design from afar with visits)" has no chances in producing truly appropriate or sustainable solutions [1].

A product or a service designed without engagement of the end user is most likely doomed to fail. Only engagement of the user in the design process can eliminate false assumptions of the designer about the user needs, contexts and behaviours and outline true opportunity areas for improvement. The audience has to be engaged as experts on their own needs. The role of the designer in this context shifts from being an "artist" to being a listener and enabler, the one who translates the audience's needs into opportunities and design solutions. Only hand in hand with the audience designers and companies can build products and services that can truly answer the end-users' needs and remain useful for extensive periods of time.

Another important reason for audience engagement is the strong correlation between the level of audience engagement and the degree of design's final impact. When the audience is engaged in the design process, they share the ownership of the creation and, consequently, relate to it much stronger.

Engaging the audience through social media

Luckily, many institutions understand that the table is turning: regular individual is more than just the main source of design insights and inspiration but also a voice that likes to be heard. Just 20 years ago the average user was able to share her satisfactions and concerns with merely a dozen of other people, whereas today she can easily reach out to millions through the social media. This shift in audience power should be put into consideration. Users should be treated as active players of the production arena who are vocal about their opinions and assign different meanings to their consumption [8]. Many brands and institutions have already adapted to this change by holding a constant active dialogue with their users and building a strong and lasting relationship with them. Examples such as the "MyStarbucks" project use social media to bestow part of the brand ownership upon the users, create a sense of community and, through this, radically develop the engagement [9]. Another great example of such engagement is the "By the city for the city" project – a massive brainstorm for improvement opportunities of public spaces in New York city. Through an online platform every New Yorker got a chance to share an idea for her close and far neighbourhoods or the whole city. Out of six hundred submitted ideas, the ten best were voted and implemented by professional designers and architects [4, 10]. These examples not only engage the audience, co-create products and share the brand ownership with the user, but also enable and utilize the greatest potential of the digital age: the power of the massive brain. Many similar projects of different scales – Pepsi

Refresh, Lego Mindstorms, Samsung Nation to name but a few, gained significant benefit through smart use of social media engagement strategies. They are listening to the user and crowdsourcing ideas. They are taking a stand, supporting related communities and causes, organizing sweepstakes, competitions and voting, understanding and fulfilling wishes and dreams of users as individuals and communities [7].

In short, the above examples illustrate how social media allows for:

- **building deeper engagement trough involving users in the design process and allowing them to "own" the brand**
- **creating a scene of community**
- **building stronger and more lasting relationship between the company and the user**
- **enabling power of the massive brain**

Social media is a powerful engagement tool but it is far from being a panacea of the 21st century engagement. For example, social media communities seem to be a fruitful ground for engagement, especially considering studies which show that people engage much deeper if they are addressed in communities [5]. Moreover, social media communities have many significant advantages over "physical" ones: they are easily accessible at any point of time and allow for a freedom of anonymity.

However, many scholars have no faith in social media communities. Malcolm Gladwell in his article "Small change. Why the revolution will not be tweeted" proposes that online communities will never have the bounding power of physical ones. Drawing on examples from history, he claims that the main underlying principle of significant community-driven action is not the ideological favour, but the "brotherhood", the personal connection in physical proximity. Digital engagement thus, he claims can never be as strong as the physical one [3].

Yet, it's obvious that contemporary ever-accelerating lifestyles hardly allow for "physical" community engagement in its traditional form. Therefore we decided to explore how "physical" engagement could work today and compare it's impact to the one of social media.

Engaging the audience through interactive art

In the two experiments described below we attempted to engage people of inexistent but potential physical communities- those based on location, interests etc. We chose to use interactive art installations as a trigger point for engaging audiences and observing behaviours of people as individuals and as part of a group. We also explored the possibility of using these installations as an engagement element drawing people into further action. Two interactive art installations were built: "Fires and tears" and "Seesaw swing". Both of these installations drew a lot of inspiration from The Fun Theory project by Volkswagen where interactive installations were successful in not only engaging the audiences but in affecting their long-term behaviours [11]. Under the umbrella of engagement, we explored

such topics as collaboration, behaviour change, spontaneous interactions and other.

Fires and Tears Installation

"Fires and tears" produced visuals based on movements of a human body interacting with the installation. The correlation between generated visuals and the body was very straightforward. This installation was displayed twice during 2011-2012 in the Shush Helsinki event and the 100 dancers festival in Warsaw. Approximately sixty people, both dancers and non-dancers, alone and in groups, experienced the installation.

Observing the behaviour of people around the installation, we noticed the following patterns:

- Many people joined only when someone was already interacting with the installation. It was easier to join in rather than start interacting with some vague goal. Furthermore, trying to interact was more fun than just watching.

- Group interaction generated many fascinating collaborative moments.

- People made new connections through the installation: they would walk up to it without knowing each-other and walk away sharing experiences and emotions.

Seesaw Swing Installation

Within the "Seesaw swing" project we decided to employ similar attraction mechanisms and take the engagement one step further: to use the initial public involvement as a trigger for community action. We

Figure 1. Fires and tears installation.

aimed at finding a location and a theme that could be relevant for different societal layers. Thus, we decided to try and attract the passer-by of one of the busiest locations in Helsinki- Kamppi area, and engage her into playful action. We built a wooden seesaw swing that was tracked by a sensor and produced musical sounds. We also created a childish atmosphere and drew more attention with colourful balloons and soap bubbles. Once the passer-by tried the swing she was invited to the second part of the installation which was about drawing on the collective canvas of dreams and reflecting her experience in the context of current location. Observing the behaviour of about forty people who interacted with the installation showed that:

- The positive vibe of the installation attracted those who were alone and helped to get engaged in interaction with others.

- The installation felt more approachable when some people were already interacting with it.

- Collaboration gave participants positive emotions and allowed them to build upon each-others' ideas.

- Interactive swing proved to be a good attraction mechanism. Most participants getting engaged through the swing went on drawing on the collective dream canvas.

Figure 2. Seesaw swing installation.

This kind of engagement through interactive art installation can be used for attracting crowds for e.g. acting on causes in neighbourhoods, gathering data and ideas, for educational purposes etc. As The Fun Theory has proven, when embedded within everyday tasks, this kind of engagement has power of influencing human behaviour.

In summary, interactive art installations:

- **act as strong engagement triggers**
- **spar spontaneous interactions**
- **engage on a deeper human to human level**
- **create a sense of local community**
- **have a potential to influence long-term behaviour**

Conclusion

In conclusion, we bring together the summaries of allowances from both social media and interactive art installation engagement studies. We discuss the allowances of the two frameworks for: spontaneous interactions, amounts of engaged, lasting relationships and community building.

	Social Media engagement	Interactive Art engagement
Spontaneous interactions	- Are rare. People don't pay attention to flashing links unless they lead to some content that they are already engaged with. Yet a recommendation from a close and trusted peer might trigger an interest.	+ With a low entry threshold, a random passer-by notices the installation, gets interested & approaches to see the installation closer or to try it out. Also a lot of spontaneous collaborations

		happen between unacquainted interactors.
Amounts of people	+ Potentially massive numbers of people at any location and time can get engaged through social media.	- The amount of engaged purely through this channel is limited by people who physically interact with the installation while it is installed on sight.
Lasting relationships	+ Social media platforms are usually accessible on long-term basis. The engagement of the audience is deepened by listening to their needs, involving them in the design process and sharing the brandownership.	- Interactive art installations can work as a great engagement trigger, but are limited in relationship building by the installation's lifespan.
Community	+ Allows for existence of huge communities. However, the level of engagement on average is not as high as in physical communities.	+ Has greater engaging potential through creating a sense of physical community & strong interpersonal bounds.

Table 1. Social media versus interactive art engagement allowances.

As seen from the table, interactive art installations are more useful at capturing audience's attention while social media is better at engaging those already familiar and interested with the presented idea. It can also be implied that while interactive art affects fewer on a deeper engagement level, social media scales up in the number of engaged faster but bears weaker relationships.

While the impact of these two methodologies and their role in the context of the whole engagement ecosystem requires further investigation, it is obvious already at this stage that neither of the frameworks can be effective as a stand-alone solution. The next stage of this project should empirically look into the interrelation and fusion of these two engagement systems and also explore potentials of the following substantial topics that evoked in this study:

- playfulness as ubiquitous engagement mechanism
- engagement of massive brain & peer collaboration
- enhancement of physical and digital communities through interchangeable engagement

Acknowledgements

We would like to acknowledge the colleagues who supported the empirical part of this study: Ferhat Shen, the coding guru of Fires and Tears installation; Reha Discioglu and Veronica Bluguermann, the architects of the Seesaw Swing.

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Breakdowns in Participation: A Case Study in the Museum

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Abstract
This paper investigates how to overcome the breakdowns in museum exhibition participation. To investigate this, a case study where I participated as interaction designer, is presented and analysed. The case study is of a Helsinki Design Museum exhibition, in 2008. The analysis of the case study focuses on the breakdowns in participation found in the case study. The breakdowns were, more than mere problems, valuable signifiers. They indicated key challenges and opportunities for different strategies for engaging with the museum community.

Author Keywords
Audience; museum; interaction design; participation; community; co-design; user-centered.

ACM Classification Keywords
Design, Human factors

Introduction
The focus of my research here concerns breakdowns in exhibition participation. Exhibitions can be great opportunities for education and cultural development, if the exhibition environment is seen in a holistic perspective. Everyone involved in an exhibition, from the organizers, designers, attendants, to visitors can

gain personally and socially. However, in my findings, the degree of benefit to and participation of the exhibition environment as a greater whole tends to correspond to the degree of inclusiveness with which the exhibition was organised. Alas, the typical exhibition organisation scenario sees a clear division between exhibition planners and audience. I will try to identify the breakdowns in exhibition participation, and how to overcome them.

Holistic participation in exhibition formation is unfortunately far from the norm. Mostly the term 'museum community' is understood as the museum personnel, and not the community to which the museum belongs. Museum studies typically show a clear division between museum personnel and audiences. This is not adequate. Through my work I have understood the importance of the inclusion of other members of the museum community such as museum personnel, the artists and/or designers that have pieces in the exhibitions, museum friends, online visitors and others interested in the museum collection, in exhibition formation. Visitors can be part of the design process by collaborating from the very beginning of the exhibition and forming its concept ([7], [2]) and/or by providing the objects that make up the exhibition. Museums have often invited communities to contribute to the forming of exhibition content. A good example is The Victoria & Albert Museum's *People's Show* [1], where a group of visually impaired people were invited to contribute to the exhibition by choosing objects from the museum's collection, as well as of their own, to be exhibited.

Seeking to investigate audience participation, its breakdowns and how to overcome them, I participated in the creation of the Design Museum Helsinki exhibition analysed further below. In this exhibition, the museum staff, the visitors and the external collaborators contributed to the formation of the exhibition by commenting on the exhibition's content, both online and in person at the exhibition, while it was happening. With regards to making exhibitions more holistic and inclusive, those community-created commentaries worked like interpretative material helping the connection between visitors and exhibition content.

For the analytic needs of this case study, I have embraced and combined two traditionally separated museum community groups into one. The term "community", here, refers to visitors, the entire staff including guards, guides, curators, educators, marketing specialists, cleaning personnel as well as external researchers, artists and designers. I believe that participation strategies should include the whole museum community. Thus my research question is: How are breakdowns in exhibition participation overcome?

The Secret Life of Objects

The Secret Life of Objects exhibition sought to develop services for the permanent exhibition of the Design Museum Helsinki. My research goal was to further develop the concept of a participative digital board and its content through co-design practices with staff and visitors.

The digital board included audiovisual material and written texts from workshops and events held in the

museum. This material was displayed as links on the digital map of the exhibition with the purpose of encouraging visitors to comment on the exhibition. I tried to encourage participation further by demystifying the notion of the expert curator and I included and showed comments made by children and young people. Poems, video and music comments were included with the clear aim to inspire the visitors' creativity.

The Secret Life of Objects explored creative uses of the Museum's collection through partnerships with artists, in this case children and teenagers, who play music and practice creative writing. In line with the work of Suzanne Keene [4], who has supported creative uses of museum collections, the aforementioned participative digital board used the museum collection as a resource to inspire the creation of personal comments by the museum community.

Three workshops and two events were organised, as part of *The Secret Life of Objects,* to help develop content provided by different people of the museum community. The resulting material was edited and added as links on the interactive map. Two interactive maps based on the permanent collection of the exhibition were designed and exhibited in the museum. Part of those maps' content, exhibited before the opening, was the outcome of the workshops and another part was created by museum educators. Finally, an exhibition, entitled *The Secret Life of Objects,* was created featuring objects from the permanent collection and was on show in the museum for three months.

Identified Breakdowns in Participation

Following is a description of the breakdown-related occurrences in exhibition participation found in the *The Secret Life of Objects* exhibition.

Enhancing collaboration with external partners

Participation breakdowns were often observed when the museum community as a whole was not being considered in the planning, production and final exhibition. Often, these participation breakdowns had a follow-on effect affecting more than only those sidelined by the preparation and showing process of the exhibition. A common occurrence of this is a disconnection between museum exhibition/custodial personnel and external partners in the form of exhibition planners and designers. When the exhibition personnel were not in contact with the exhibition organizers, it was much more difficult for them to explain the exhibition to the visitors and, consequently, connect with them as well as inspire more visitors to come and see it.

Including the whole museum community.

An important missed opportunity the voice of the designers or artists work in the exhibition was not included in the participative digital board. This was largely due to a lack of resources and time. Although I did interviews with the artists and the designers, this material was not on the map during the exhibition. It is crucial to ask those participants for their reflections on the exhibition. The artists' voices, once formulated in a clear and simple way, can convey new paths to understanding of the content. Participation should include everyone, democratically, in the project ecology.

Acknowledging audience participation as strategy
In some cases visitors' participation is not planned as the main strategy for the exhibition but is designed around a certain interactive piece. In the case of the Design Museum, visitors' participation was planned as the main strategy for the exhibition. Therefore, communication materials were conceived in order to emphasize the connection with the audience and inspire audience participation. This strategy was new for the museum.

Combining participation and educational activities
I found that educational activities like workshops held in the museum, in most cases did not enrich interactive pieces in the exhibition. The interactive pieces remained isolated from the content created during the workshops. The possibility to reinforce each other is often unexplored. During the *The Secret Life of Objects* project*,* workshop materials were included in the interactive map's content.

Interactive hindrances
Visitors wanted to participate and use interactive pieces but in some cases the proposed participation might have been too difficult or unattractive for visitors. The computer's presence intimidated some visitors while others mistook it for a mere info-point, content they thought they could otherwise access from home.
A big challenge then is providing accessible interfaces to a wide range of museum visitors.

Allowing new formats
Allowing visitors and staff to reflect on the exhibition material, by writing, drawing or making music, is a new method. I see it as a useful way to get visitors to engage and reflect on exhibitions. Multimodality is particularly important. However, inspiring people to submit media content not already seen on the internet was difficult to achieve.

Changing the passive attitude
Visitors do not consider themselves as potentially important exhibition contributors, and assume a passive receiver role. During this project, visitors' contribution to the exhibition enriched its content and the communication materials about it, as visitors themselves where creating comments during the time of the exhibition. At the same time the dialogue between visitors, shown by their comments exhibited in the exhibition, encouraged others to change their passive attitude to a more active one. Their active attitude allowed them to engage with the exhibition after their visit, such as leaving online comments. Participating in the content creation offered them a more meaningful relation with the exhibition’s content.

Aiming for Transparency
When publishing user-generated content for the cultural heritage sector, it is crucial be clear about ownership issues. ’Appropriate copyright clearance must be obtained for object metadata, images and GIS data before publication’ [5]. User- generated content can be used in multiple forms, and it is only fair this is made clear to contributors.

Conclusions

The way to overcome museum participation breakdowns is by enhancing collaboration with the museum community as a whole, involving external partners, co-designing with them, allowing new formats, changing passive attitudes, and aiming for transparent participation terms.

Identifying these breakdowns contributes to future research agendas which seek to develop museum visitor participation further. Special contexts and situations that the case study described in this paper offered are part of these breakdowns. Even though the analysis is case-specific, the highlighted issues can open up a more general discussion on inclusion, participation and openness in museums.

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Audience Participation in Museums: Game Design as Learning Activity

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Abstract
We discuss game design as an example of museum audience participatory activity and we identify its learning dimensions. In particular, we elaborate on the role of technology in providing a scaffold that can help museum audience to construct games which can function as "public artifacts" and can be added to the museum's assets, enhancing audience engagement and community building. It is claimed that the emerging trend invites visitors to participate in the process of culture creation.

Author Keywords
museum learning, game based learning, museum audience participation

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

Introduction
This paper builds on previous work about the use of technologies for learning in cultural institutions [1] where an analysis of selected cases revealed that technology mainly functioned as a medium for information delivery. This use of technology treats culture as something that can be "transferred" from the "knowledge holding" museum to the visitor. In this

context, museum experience is structured around the consumption metaphor: the museum produces "information" in digital or other form, for the visitor to consume. Studies evaluating the learning experience of the information consumption metaphor highlighted visitor limited ability to remember, digest and utilize the information offered [2]. Furthermore, various studies report decrease in the audience of museums and cultural institutions [3]. Technology has been employed in various ways by museums to support their reconnection with the public where we identify two main trends with respect to the learning experience pursued. One, more established one, focuses on refining the information and the way it is delivered to the visitor. The second more recent one redefines the role of the visitor and her relationship with the museum in the process of culture creation. In this paper we briefly refer to and give examples of learning experience based on visitor participation in culture creation, in particular, based on game creation.

Participation as a context for learning

Participation-based cultural experience is based on the assumption that culture is generated dynamically through the dialectic relationship between the museum and the visitor [3]. Proctor [4] used the metaphor "From Parthenon to Agora" to illustrate the shift from the perception of cultural experience as something that the museum holds and the visitors see but don't touch, to something that can be discussed, shared and negotiated. Apparently, the role of the visitor in this context changes to collaborator and partner [3]. Furthermore participatory cultural experiences imply a new relationship between the visitor and the museum which is not restricted to one off or first time visits. Instead, participation aims also at building an enduring relationship with existing audiences and communities (museum friends, volunteers, etc.) related to the museum [5]. Building an enduring relationship between the visitor and the museum through active participation of the visitor enhances the cultural experience for the visitor and enriches the content and the impact of the museum also on first time or one off visitors (ibid). In the wide spectrum of participatory activities we identified two types of activities relevant to our analysis. The first type of activity reserves for the visitor a role similar to the documentation process performed by the museum. The proliferation of mobile technologies and social media has supported the creation of user generated content using various crowdsourcing practices [6]. The second type of activity aims at resuming or approaching cultural experience through engaging visitors in the creations of "meta-artefacts" – i.e. games or stories based on compositions of elements of cultural content - which are supposed to have a public status. The idea of involving visitors in creating computer-based public artefacts that make use of cultural content is new. It builds on a theoretical background that acknowledges the gap in the communication between the museum and the visitor and calls for active participation of visitors in the dialogue with the museums [7, 3]. Three examples of this kind are:

(a) The British museum organized a 2- hour family workshop on game design. Participants were invited to build their own games that can be uploaded on the web, inspired by the collections and stories of British museum (after visit experience).

(b) In Tate Gallery young visitors (6-12 years) create games for Galleries [8] and films for pieces of art.

(c) An activity involving remixing museum content for the creation of a visitor generated narrative [9].

These examples build on the idea of "objectified cultural capital" [10], which explains that cultural experience is not just an issue of access but it is also an issue of background knowledge that supports the person to appreciate and understand the value of a piece of art. Museums and cultural institutions offer in the process of culture creation not only the objects-exhibits but also the background knowledge about the exhibits. In our view the key in this process is how we integrate and combine exhibits and background knowledge in the cultural learning experience. For example, museum knowledge does not have to be presented as an axiom to the visitor but in any case it needs to come into his/her attention as material to be negotiated, discussed, shared and used for the construction of something new. We argue that technology can play a crucial role in this approach and we further illustrate this presenting the example of game design as a context for learning in cultural institutions.

Game design as learning activity in cultural institutions

Game play is not a new practice for museums, as play is an important element in our culture and society [15]. Whereas there is an extensive analysis on game play, research in cultural heritage sites have not addressed yet the idea of game design as an end user activity. Interestingly, research in the field of technology enhanced learning has already highlighted the learning potential not only of game play but also of game design and development [11]. Game creation in cultural institutions as participatory learning activity should be integrated in activities that will give the chance to visitors to interact with museum staff and discuss, negotiate, and integrate in their games different aspects of cultural content. Game creation can be supported by technological scaffolds (such as game templates) and personalization techniques that present the museum view in order for the audience constructions to meet their standards and become a public artifact that can be used by other visitors, can be shared, revisited, discussed, changed and expanded.

When it comes to technology based scaffolds for game design there is a question we need to address: Do we need to design game-creation platforms to support learning in museums or we can use existing solutions such as KODU, storybricks, Game Star Mechanic, Game maker, the Games Factory, etc. (for a critical review of technologies for game design see [12]). The answer here is that the technologies used for game design are configured to support not only the creation of games but also to facilitate the other objectives related and integrated in game design (e.g. the different types of learning, or in our case the cultural experience). Thus when game design is employed for purposes other than game creation then the design tools consist of elements and support practices related to the purpose for which game design is employed. So, for example in the case were the learning objective involves spatial concepts then the tool focuses on bringing into the foreground the issues related to orientation, map alignment, use of systems of reference and how these will be integrated in the game (for a detailed description see [13]). It becomes apparent then that if we want to employ game design in the cultural experience we need to create a

platform that engages users with what is considered crucial for the cultural experience. In the case of cultural experience the game design platforms could focus on the connections the visitor can make between the different cultural artefacts and with overarching concepts, beliefs and narratives [14,6].

Example: the Linking games template

In this section, we discuss three of our own recent projects that are based on the idea of a template for linking games for visitors of cultural heritage sites that allow for audience generated content. The first project, **MuseumScrabble**[1] (2007-2009), is typical of the first phase of location-specific games. The rules of the game allowed for competing teams of players (typically visiting school classes) to make connections between exhibits and more abstract topics. The more meaningful the connections, the more points a team get.

Figure 1. CityScrabble: (A) topic selection, (B) link topic to object, (C) objects on the map

[1] hci.ece.upatras.gr/museumscrabble

The players moved in the museum with a hand-held device and scanned the exhibits they deemed as important to the game. The museum administrators could alter the game content by introducing new topics that can be meaningfully connected to exhibits.

CityScrabble (www.cityscrabble.gr) is the implementation of the same idea for open spaces. It is a multi-player mobile game (for Android) where players are competing individually or in small teams in order to locate objects in the real world and connect them with "keys" using their mobile devices. They can be any place or object that is tagged with a QR tag in the area and are activated when a player scans the tag with the device or when she gets within range, using the GPS to prove that she has correctly identified it. The game is independent of the location, and the content can be modified and adapted to different sites.

A variation of this idea, **BenakiMuseumScrabble** (hci.ece.upatras.gr/bms), is a current project for a major historical museum in Athens, Greece. Visitors use mobile devices and explore the museum trying to connect the exhibited items with content that is not part of the current exhibition. The rules of the game allow the visitors to construct "paths" that link the exhibited items in possibly unexpected narratives. Each such path consists of a link between an item that is exhibited and hidden content.

Related to the above is the **Game Content Editor** is an on-going project that aims at involving the audience in the creation of content, including game rules adaptation. It uses the Google+ Hangouts API to provide a publicly accessible interface. The current iteration of the GCE supports the CityScrabble game.

Users can connect and create content for any suitable location (e.g. a city center, an archaeological park etc). The combination of the public editor and a game that can be installed by anyone allows for audience – generated visitor experiences.

Concluding Remarks

In this paper we discussed the use of technology as a medium for learning in cultural institutions with a focus on visitor participation in the process of culture creation. Our analysis shows that participatory activities such as game design when scaffolded by technology and integrated in museum activities can offer rich learning experiences which reserve for the visitor the role of collaborator and partner and entail the creation of an enduring relationship with the museum. This rather new approach needs to be further investigated and supported through specific game-design tools and empirical studies.

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