Designing with the experiential in digitally augmented exhibitions

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Abstract

The ways in which audiences interact and make meaning of digitally augmented exhibitions is an important design determinant. In such an interdisciplinary project, the design, the museum and new media encounter the problem of the experiential. A creative experimental analysis of audience experience employing aesthetic visualisation semiotics drawn from the principles of information design, computational aesthetics and human centred design is argued as a relevant adjunct to an exhibition providing fresh perspectives and new knowledge to interdisciplinary stakeholders. Interactive, experimental artifacts, known as field and body, provides a conceptual map of the exhibition experience relying on the creativity of audience participants in making visible, legible and tangible their personal reception of a work. The data yielded reflects abstract notions of audience experience engendering a discussion about the phenomenological, curatorial and cognitive effects of the digitally augmented exhibition.

Keywords

Co creation, user experience, information design, digital container

1. Introduction

Human centred design and the museum have undergone parallel changes regarding the position of the audience. Human centred design refers to the philosophical and theoretical discussion focused on prioritising the human being in the overall design program (Preece, Rogers & Sharp 2002, Hanington, 2006, Buchanan, 2006, Sanders, 2006). Human centred design is a broad term that acknowledges the concept of the user surpasses ‘use’ to incorporate a sentient person situated in their world. In reframing their nature and practices, museums have also come to understand their audience as plural in its composition (Macdonald, 2006, p.31). Barbara Sudick (2006) argues that each person shapes their dialogue with an artifact and constructs their own unique understanding of a message “influenced simultaneously by intercultural, cultural, social and personal contexts” (p.186). Understanding the museum visit as a participatory social activity privileges the experience of the audience as a requirement to be addressed in the museum’s audience research activities (Kelly, 2004, p.49). Paralleling the challenge to designer-driven from human centred and participatory design, the museum-as-expert and the audience-as-novice communication model is now commonly seen as an anachronism stemming from an overtly didactic past. Indeed, Douglas Schuler and Aki Namioka (1993) could be writing of human centred design or contemporary museum practice when they argue,
participation stands in contrast to the cult of the specialist. In the specialist model … [t]he question is presented to the Expert who will eventually produce the Answer. With this approach, those most affected by the conclusion must sit idly by, waiting patiently for enlightenment (p.xiii).

For Helena Friman, (2006) museums’ future hinges on “their relationship with the public” (p.55). Following André Malraux, she takes the idea of the ‘museum without walls’ to challenge museums to merge with potential communities. This she argues requires the museum to shift its focus from what the museum is to what it does. Friman (2006) argues that for most museums it’s not enough to have sophisticated well designed exhibitions; talented curators and marketing staff “must adapt a new strategy and use their resources with the public in a more creative way” (p.56).

Such philosophical developments have seen the call for museums and other cultural heritage institutions to adopt technology to expand the dimensions of peoples’ interaction with their programs and collections, while still promoting learning. L. Smith, (2001) argues that technology is transforming all aspects of museum activity, bringing about fundamental shifts in the operation of cultural and knowledge institutions. Angelina Russo (2009) reports on the role social networking has played in connecting organizations and audiences (p.2). The development of digital exhibitions has enabled diversification and disseminating exhibition content facilitating more democratic outcomes for museum visitors. For instance, as curators recognize the potential for multiplicity of meaning, they are compelled to become less didactic and more open in their choices of exhibition form and content, taking on the role of facilitators of experience and learning, embracing a multiplicity of representational techniques and processes based on intercommunication with visitors (Kelly, 2004, p.50). Yet discussions of digital presentation systems in the museum are often mired in the fetishization of technological advancements, which fail to grapple with museums’ major challenge in mediating exhibition content, technology and audiences.

Where museum activity encompasses not only the presentation of cultural objects and information but also experiences, correlating audience experience with the digital immersive augmented exhibition (digital container) is argued as equally important as the technology. Therefore the museum and its contributors cannot afford to deploy digital technology without understanding processes of mediation or adopting human centred approaches.

The ‘appearance’ of the audience in the philosophical domains of museology and design is an important concurrence. Over the last ten years, a move towards an inclusive and interpretive paradigm of practice concerned with better understanding people has affected a number of disciplines within the museum, including audience research, museum pedagogy and exhibition evaluation (Hooper-Greenhill, 2004). Audience research in the museum is an umbrella term that
comprises visitor studies, visitor research, evaluation and market research (Kelly, 2004, p.49). Measures of success based on the museum’s ability to transmit knowledge on a functional level, albeit important, particularly in reference to science and natural history exhibitions, have lost currency along with behaviourist models of audience research where the museum visitor is examined in terms of the effectiveness of their response to the museum’s stimulus (Macdonald, 2006, p.320). Within such a model, design served the role of ‘packaging messages’ to help pass over the expert-visitor divide (Macdonald, 2007, p.150).

The role of designers, like that of the museum visitor, has shifted from a passive position of waiting to receive a mission to an active one of exercising influence over the content and form of exhibitions. For example, summative museum exhibition evaluation sees the exhibition not as a fixed destination, but rather something under continual evaluation and change. Michelle Henning (2006) argues that this shift can be traced to the 1970s, when “museums began to employ professional communicators and designers to mediate their messages to the public” (p.314). Designers, once tasked with delivering an attractive medium for the presentation of content, began to act as translators and facilitators of information, a role which today has become integral to the conception of many museum programs (Macdonald, 2007, p.150). Design is increasingly acknowledged as central to the visitor’s experience, with potentially profound connotations for determining the inherent character of that experience (Macdonald, 2007, p.150).

The effort to create a progressive museum model more responsive to the needs of visitors requires communication between audience research, design and museum practice. Understanding people and their role as interlocutors of an exhibition or an entire museum program demands innovative research methods. This is evidenced both in audience research and design practice. Co creative, participatory human centred design methods assist in exhibition concept development as well as the evaluation of exhibits where visitors are no longer considered ‘an undifferentiated mass public’ (Hooper-Greenhill, 2006, p.363, Sanders, 2002, p.5). The intention is that audience and designer gain new knowledge as they are “as active interpreters and performers of meaning-making practices within complex cultural sites” (Hooper-Greenhill, 2006, p.363).

The resurgence of Benjamin Gilman’s (Gilman in Kelly 2004) observations of people in the 1880s identifying visitor fatigue underline an interest in the phenomenon of the audiences experience. Gilman concluded that prioritising the aesthetic and curatorial in exhibitions without considering visitor-focus was in danger of being poorly designed. He specifically argued that the physical well-being of the visitor affected and impeded on the reception of the exhibition (p.51). This paper extends on Gilman’s notion of well-being to include the emotional, the social and thus felt responses of audiences in a digital immersive exhibition.
1.1 Communication spaces

Falk, Dierking, and Adams (2006) argue that, “in a world that allows for multiple perspectives, the conditions for meaning have become as important as the meanings themselves” (p.325). For design, these conditions of meaning are relative, the act of communication framed by several key conditions, which Frascara (2006) argues, “provide a context, a code, and a possibility … [and] also allow and constrain the communicational outcome” (p.xiii). Frascara (2006) uses the terminology of frames to explore the nature of a communicational event, which he sees as always situated. For Frascara, communication is a constructive as well as a transmitting act. Not only is it “something that always happens in a setting”, communication designers forge “‘a space’, where the public meets the message” (p.xiii). This ‘communication space’ proposed by Frascara is not based on designers’ intuitions or authority. Sudik (2006) argues that the communication space is a dialogic medium for processing information transactions, operating “like a conversation-always adjusting, changing direction and focus with stops, starts, and surprises-between individuals or groups with different cultural backgrounds, life experiences, thinking, or cognitive styles” (p.186).

Communication spaces require negotiation between designers and audiences. Communication spaces may be physical or virtual, or take the form of containers as in the case of digital immersive museum exhibits. Frascara locates the communicational power of spaces in the objects that populate them as well as in the characteristics of the spaces themselves.

What are the characteristics of the communicational potential of the spaces provided by an interactive digital augmented 3D stereoscopic immersive exhibition (digital container) such as the PLACE system (Shaw, 2009)? Investigating ‘an experience’ in the digital container is fundamental if we are to follow human centred design and museum research paradigms. What are the transactions between the audience and these digital immersive spaces? How are the messages provided by the content providers, constructed by and received by the audiences? What is the influence on the combinatorial factors such as the dynamics of the interior, the audio, 3D stereoscopic animation and presence of others? How does the audience actively contribute and build their experience of these digital containers? How is it possible to convey or discuss these abstract phenomena? Furthermore how can all stakeholders engage in the discussion?

Here the questions outweigh the answers found in the literature. Design of ‘multiuser systems’ that expand into new areas of audience experience are in urgent need of attention (Krippendorff, 2006, p.208). Investigation of ‘an experience’, through the interactive artifact of the digital container is proposed as a collaborative activity. An analyses of ‘an experience’ in the digital container aims to generate co creation activity between the designer, audience, content providers and technology.
1.2 An analyses of audience experience in the digital container

A study of PLACE-Hampi consisted of a questionnaire that was conducted in conjunction with the exhibition, *Spark to Pixel* at the Martin-Gropius-Bau, Berlin, 2007 (Kenderdine, Shaw & Kocsis, 2009). The questionnaire was designed to generate a mix of quantitative and qualitative information about audience experience in the PLACE-Hampi exhibit. PLACE- Hampi based on an interactive projection system, invented by Jeffrey Shaw, has today integrated stereoscopic 3D projection amongst other features documented at http://place-hampi.museum. Its main attraction is the motorised platform that lets the viewer rotate in their projected point of view in 360 degree within its large cylindrical screen enabling a multi-media multi-sensory presentation of the archaeological, historical, and sacred locations at the site of the World Heritage of Vijayanagar in Hampi, southern India (Kenderdine, 2004, 2007, 2008).

An analysis of the findings bought new information pertaining to the audience’s world within the exhibition space (Kenderdine, Shaw & Kocsis, 2009). This informs the creative and experimental framework of the interactive artifact known as field and body. Furthermore findings about the social and the co-experiential aspects of the exhibition audience inspired aesthetic visualisation of the audience experience via the interactive artifact. This artifact is proposed as an adjunct to a digital container exhibition. The interactive artifact aims to provide a post exhibition debrief whilst facilitating for stakeholders of a digital exhibition project a creative participatory avenue in the exploratory, generative and evaluative phases of research and design (Hanington, 2007, p.3). The interactive artifact provides an abstract and experimental visualisation of an equally abstract and difficult to qualify expression, namely ones experience of the exhibition.

1.3 A phenomenological approach to audience experience

The difficulty with experience, however, is that we can only experience our own life, what is received by our own consciousness. We can never know completely another’s experiences, even though we have many clues and make inferences all the time (Turner & Bruner, 1986, p.5).

While a discussion of experience would not appear to require specialist knowledge, since it is a universal concept that we can all relate to on some level, a concise understanding, framing and conceptualisation of the term is not easily accomplished. Experience design, audience experience,
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user experience and HCI reveal that definitions across the ‘experience studies’ community are inconsistent.

In the context of the author’s investigation, the concept of experience is described as qualitative aspects of human thought, activity and behaviour. Here experience is defined as a synthesis between abstract reasoning and the senses. It enables the designer to identify and make useful the difference between the learnt and the felt, between intuition and formal knowledge, and between the objective and analytic and subjective perspectives. Dewey’s (1979) account of ‘an experience’ serves as a workable context informing the meaning attributed to the design of the interactive artifact. An experience is defined by a clear start, completion and a cohesive trajectory. Dewey thus clearly distinguishes an experience as marked by a sense of fulfillment, unity and completion. It is this working definition of experience in conjunction with a pragmatic phenomenological framework that forms the context for drawing specific insights about the audience experience in the digital container. A phenomenological account proposes that the task for researchers is “to make manifest the incessant tangle or reflexivity of action, situation, and reality in the various modes of being in the world” (Orleans, 2000, p.2101). Phenomenological studies undertake analyses of small groups, social situations and organizations using a number of qualitative techniques, methods are employed to uncover the subjects “life world” (Orleans, 2000, p.2101).

The complex and abstract nature of an audience’s inner life challenges the process of extrapolating the meaning of experiences. Its fleeting and effusive character and its unclear temporal nature – the fact that experience seems suspended in time between presence and its memory- makes difficult any attempt at defining experience. As Wilhelm Dilthey (1976) argues,

the relationship between experience and its expressions is always problematic […] and
the relationship is clearly dialogic and dialectical, for experience structures expressions,
in that we understand other people and their expressions on the basis of our own
experience and self-understanding (p.161).

Therefore it is proposed that representing such an abstract and subjective concept requires collaborative experimentation that engages in co creative activities in order to generate further discussion. A visual sensorial and interactive activity ideally can facilitate the interpretation of an experience given that the structure of experience is a hermeneutical and reciprocal process in which revealed is the intimate connection between experience and representing experience: “experience structures expressions and expressions structure experience” (Turner & Bruner, 1986, p.5).

Sharon Macdonald (2007) argues that although audience research encompasses issues of media, sociality and space and recognises an active pluralist audience, “that there has not yet developed a
significant language in which to describe and analyse the phenomena on which they focus” (p.158). Evidently, the work of sketching out this horizon and of finding a language for a technological phenomenology presents challenges. Macdonald (2007) also suggests that devising an ‘affective syntax’ of exhibitions or a common set of rules seems a rather complex project (p.159). Nonetheless, the interactive artefacts field and body aim to further the discussion pertaining to audience experience in the digital container where the functional criteria become complemented by phenomenological criteria. As design values have moved from “objects to experiences, from procedure to situation, and from behaviour to intent” (McCullough, 2005, p.50). Designers have changed the question from “How is it used?” to “How does it feel to use?” This phenomenology of engagement as suggested by Malcolm McCullough (2005) is evident in the work of designers that build technologies and digital artifacts around the everyday. However, the phenomena of experience of the digital container in design research has attracted seemingly little descriptive and analytic focus whereas schematic frameworks and experimental toolkits dominate research methods. The experimental artefacts in this paper aim to generate participation and discussion.

The conceptual understanding of the phenomenology of an experience in the digital container was based on an analytic framework from a questionnaire in 2007 of the audience experience in a digital container (PLACE- Hampi). The analyses and the findings (not discussed in detail in this paper) play a vital role in informing the design of the interactive artifact. The components of the analytic framework belong to a set of psychological and physical, sensual and supra-sensual, individual and social, and intellectual and affective parameters. The set is structured by the concepts of emotion, embodiment, scalability, composition, spatio-temporal, ‘flow’, and co-experience. These components are crucial to better understanding ‘an experience’ in the digital container. Key concepts pertaining to an experience as part of the questionnaire focused around “specific propositions, questions, or activities” (Yin, 1981) of the digital container developed by the author were clustered thematically and listed as follows:

- Orientation / navigation /negotiation / time in the space / spatio-temporal
- Bodily experience of the space / embodiment
- Relationship between user and screen content
- Relationship between user and interface usability / participation / orientation
- Level of immersion (‘being there’, presence, sense of travel)
- Flow (time spent, level of involvement)
- Social experience levels: individual and co-experience
2.0 The post exhibition interactive artifact

2.1 Background

Post analysis of the questionnaire uncovered the social and largely co experiential life of the audience in the digital container. Secondly anecdotal discussion with the participants disclosed that they had hoped for follow-ups or further discussion given the extensive and somewhat grueling length of the questionnaire. The lack of opportunity to share, discuss and learn what others had to say about the exhibition, directly after the exhibition became a predominant criticism post the questionnaire. The designer saw the opportunity for a co creational activity for all stakeholders employing the language of interaction design and computational aesthetics to provide an abstract, visual platform to portray elements of the exhibition experience.

2.2 About the interactive artifact

In the context of digitally augmented spaces, audience experience research can become integrated into the installation experience as a post installation activity. As in human centred design, in co-design and in participatory design practice, the designer is required to bring together non-design stakeholders as the advocate for the audience. The audience experience can facilitate brokering in order to communicate across disciplinary boundaries and across the stakeholders’ embedded knowledge’s and practices (Kocsis & Barnes, 2008).

The findings pertaining to audience experience provide a series of designerly observations that relate the technological capability of the PLACE platform to its effective experiential dimension. The work of visualising experience brings together a number of disparate elements. Visualisation can overcome the limitations of text-based questionnaires that can be laborious to interpret and counter-intuitive to the post-installation interpretation of the audience experience. Using a visual language and an easily understood metaphoric concept, a post-installation artifact can utilise the representational potential of digital media native to the installation in order to enable participatory audience feedback. Here it draws not only on the audience’s experience of the installation, but also on the creativity of audience participants in making visible, legible and tangible their personal reception of a work.

The psychology of participation means that, following the installation, the audience can debrief cognitively while interacting with an easy-to-use and easy-to-understand visual interface.
Similarly, seeing their own experience visualised in relation to other audience member’s experiential expressions stimulates and furthers the co-experiential aspect and creates a sense of communal meaning making. The visitor/participant/audience member is no longer atomised, but can understand his or her own reception in the context of others. At the same time the continual evolution of the interactive artifact makes conceivable a non-local, possibly transnational, possibly online virtual, extension of the installation where the duration of the work is not limited by the museum location.

Current work on the artifact uses Processing (Fry & Reas, 2007, Greenberg 2007). The development and design of the artifact was in collaboration with designer, programmer (Hwang, 2009) and online participants. The physical interface consists of mouse and touch screen connected to customized data projection. Designs of both physical and virtual interface are aimed at intuitive participation and the existence of a terminal is compelling in itself; no instructions are needed. The cognitive difficulty of the post exhibition artifact is designed to be significantly less than that of the installation.

The two interface design iterations titled *field* (figure 1) and *body* (figure 2) demonstrate examples of interactive co-experience. Both designs are developed in regard to the semiotics of software studies drawn from the principles of information design, computational aesthetics and user centred design. The two themes have been chosen to illustrate the capacity of computational aesthetics and making meaning of data. The interface motifs and iconographic display can be designed to correspond to the exhibition or installation for the purpose of thematic consistency.

![Figure 1: Screen grab of interface titled 'field'](image)

Figure 1: Screen grab of interface titled ‘field’
In the current interactive artifact the interface *field* is a virtual field comprising virtual flowers that grow over time. A flower represents a single participant’s responses, while the field represents all such responses in a collective form. The attributes of the flower (height, colour, petal shape) depend on the responses prompted by the dialogue boxes. The virtual field exists in real time. The progress of time is represented by the background sky changing from night to day illustrated by colour hues. Here nature iconography is used to express and illustrate visitor experiences and to elicit a phenomenological spectrum of responses.

![Image](image_url)

**Figure.2 Screen grab of interface titled body**

While the *field* interface of the interactive artifact researches emotional and cognitive states, the *body* interface focuses on embodiment and physical reception of the installation. The interface *body* specifically questions bodily responses of the work over time. The virtual on-screen body maps colour-coded ‘visual’, ‘aural’ and ‘spatial’ visitor responses. These responses are further divided into age and gender statistics. The embodiment responses over time form colour clusters. These clusters reveal physical sensorial reception patterns.

The interfaces are designed to provide a real-time enjoyable activity in the presence of other visitors and co-participants. Interface responses become visible in real time and are represented in correspondence to all other responses. The interface thus “encourages us to leave our isolated self and interact with a greater social group” (Bullivant, 2005, p.5). The following conceptual diagram (figure 3) represents the interface in situ.
The interfaces collect and contain valuable audience experience data. Stakeholders and designer can discern patterns of data over time, can monitor the fluctuations and experiential progress of an installation, and the real-time data can be deployed in rapid re-design processes. The data in its visual form, as images, provides a conceptual map of the exhibition experience. The continual evolution of the data (as more and more responses are fed into the interface) also provides an installation experience history that “makes the human response a constantly active and evolving interface” (Bullivant, 2005, p.5).

4. Conclusions

*Field* and *body* are examples of a dynamic and evolving post installation artifact. It draws audience participation and provides a space for experiential and cognitive debriefing. It constitutes audience research that is contiguous with the installation in medial and experiential terms. The data yielded can inform stakeholders about the epistemological, curatorial and cognitive effects of a new media installation, and the ways in which audiences interact and make meaning of the new digital worlds. One of the key finding of the 2007 case study is the co-experiential aspect of PLACE (Kenderdine, Shaw & Kocsis, 2009). In the data a distinct sense of ‘togetherness’ among the audience, and some tacit and overt forms of collaboration and conflict become visible. Indeed the co-experience potential is significant and stands in marked contrast to conventional museum visitor behaviour. Interface use here constitutes the intersection of intimate personal reception of the work, and the social dynamics of PLACE. Thus, PLACE technology and co-experience are not only not opposing factors, but are deeply interconnected. While the technology allows the displacement of self-awareness, the interface use generates levels of performativity.
Subsequently interface negotiation and dwelling dispersion combine to produce hitherto unknown modes of operation, modes that were not explicitly designed for, namely, performative co-experiential ways of being in the space.

Given this information this paper further seeks to investigate these important issues over time, over a number of exhibitions and across varying cultures. *Field and body* aims to facilitate this enquiry albeit on an abstract and contentious form of experiential and qualitative data collection.

The experiential data can serve a number of functions. Firstly, it can enrich the stakeholders’ future co-design work, because data is present at the outset of a project. In the case of PLACE, the data should be eminently useful in conversations between content providers, artists and curators.

Furthermore this conversation can be ongoing as technology allows. In addition, this can overcome the traditional separation between content providers and the audience, as the data can illustrate to non-artist stakeholders how audiences, and under what conditions, interact in digital containers.

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### References


