Responsive Environments: Participants and Protagonists

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Dedication

This PhD thesis is dedicated to the late John Oakley, one time Course Coordinator for the Cultural Studies undergraduate course at Portsmouth Polytechnic.
Abstract

This PhD research project builds on thirteen years of enquiries as an academic practitioner, developing/critiquing interactive audio-visuals. This approach interweaves theory and practice so that both build on each other. It responds to the need for principles that inter-relate people, digital technologies and environments. The concept of “responsive environments” (RE) is offered as a starting point for the development of principles focusing on people within these environments. A responsive environment is “responsive” in the sense that some form of computer technologies are present and sensing/recording/reacting to people, and an “environment” in the sense that these activities are located in a place and that that place matters in terms of setting the scene, housing the technology and providing a context for the users/visitors. Common themes were extracted from the literature review to draw together previous and, for the most part, separate attempts at theory/practice relating to RE. These themes were complemented by research into contemporaneous activities in the areas of Augmented Reality, Mixed Reality and Locative Media to provided enhancements to the development of three practice projects. These enhancements together with the incorporation of Moore and Anderson’s concepts of “patient”, “actor”, “reciprocator” and “referee” as roles available to those encountering REs led to specific research questions regarding roles, positions, opportunities for repurposing content, learning experiences, the use of sound, visuals and presence, and the assessment of values represented in and through a responsive environment. In each case these questions shift the emphasis of the research towards the experiencing of REs and what they enable rather than the technologies used only. The use of Schwartz and Hâlegoua’s concept of the “spatial self” further focuses attention of the value in connecting digital expression with real spaces through an RE. This has led to a proposed conceptual framework and principles of practice that can be applied in the area of study of RE to nurture opportunities for participants and protagonists. The latter term is proposed as a means of acknowledging opportunities to make content/concepts in an RE as well as obtain and use them by participation. These opportunities are supported by both synchronous and asynchronous interactions through digital layers using online social media platforms. These platforms enable the archiving of content in a digital layer and/or possibilities for continued social interaction through a digital social layer in relation to the responsive environment. The incorporation of synchronous and asynchronous interactions through digital layers is a major contribution to the concept of REs. A further contribution is the use of the pioneering work of Gordon Pask in both the practice and theory of cybernetics as informing the concept of REs. Pask provided a formulation that expressed how content/concepts could be produced through relationships between people, computers and environments. This approach has been mirrored in other disciplines thus giving additional credence to its value. This discovery provides the impetus for further research, by academic practitioners and others, in this developing area of study.

496 words
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1.0 Chapter One

Introduction

This PhD research project builds on eight years of digital arts practice across net art, installations and CD-ROM-based multimedia from 1997. These experiences were supported through theoretical explorations, of concepts including “generative art”, “digital aesthetics” and “interactivity” (Richards 2003, 2005, 2006). The project also builds on a further ten years as a member of KikiT VisuoSonic (KVS) Research Group (KikiT 2016) at Southampton Solent University. This group creates software for interactive audio-visuals to assist musicians and others in live generation of visuals through sound. This software, supported by laptops and data projectors, has been used in gallery, museum and public performance contexts including the Victoria and Albert Museum for the London Design Festival 2010, and the London Jazz Festival, see Appendix A for further details. This career development indicates a sense of direction off the screen into real spaces and constitutes a shift into experiences not fully encompassed by the group’s preferred term of “interactive audio-visuals”.

These practical and analytical experiences have encouraged reflections on the principles to be developed/employed in this academic discipline. Indeed, what constitutes the academic discipline is problematic. An incremental approach has been taken to the development of practice within the KVS Research Group, researching digital interactive-technologies across museums, galleries, theatres, public spaces, private spaces, universities, fashion contexts, therapeutic contexts and visual arts contexts. This eclectic approach has occurred through an open remit to investigate, not confined by specific academic domains. This process mirrors the approach taken by other universities with regard to digital interactive technologies research such that there is no agreed academic discipline as compared with “film studies” or “sports studies”. Thus two universities may both run digital research units but have very different origins,
constitutions and outputs, witness: The Digital Media Research Centre at the Queensland University of Technology based in the Creative Industries Faculty, researching wearable technologies, working on initiatives in law, economics and education, and the Oxford e-Research Centre at Oxford University, with its origins in the Department of Computer Science having a strong interest in technological solutions and with collaborations in the arts and humanities (DMRC 2016) (OERC 2016). This illustrates the bespoke nature of such initiatives, building on primary research strengths. This plurality of meanings of digital research can be seen as collectively enriching but also exclusive if different registers are used to describe principles. A similar challenge arises when trying to define the area of study in which such activity takes place.¹ The temptation, in either case, is to simply record the instances in compendia and thus display the variety of outcomes. However, further to the experiences gained through the KVS Research Group, this PhD research project posits the area of study as made up of those instances that dynamically inter-relate people, digital interactive technologies and environments. Thus, the focus is not on reception of content by people only or the content only, or the interactivity only, or the technology only, or the environment only but a dynamic synthesis/analysis of these components in situ.²

This PhD research project brings theoretical investigations and practice-led initiatives under the auspices of an “academic practitioner”.³ This is an academic

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¹ At present there is no agreed term for the area of study that all parties accept. Terms used include: audio-visuals (EAVO 2012), audiovisual interactive art (Kwastek 2011), augmented reality (Mashable 2013), digital art (LACDA 2013), interactive art (Prix Ars Electronica 2013), interactive audio-visuals (V&A 2013), interactive media (Creative Skillset 2013), locative media (Galloway and Ward 2006), media art (Tate 2013), multimedia (CTheory 2013), net art (net-art.org 2013), new media art (Tribe, Jana & Grosenick, eds. 2006), virtual reality (Springer 2013), and more.

² See the critique of the “See this sound” initiative below and further critiques of isolated analysis in Chapter Two.

³ This term is preferable to “Pracademic” which is also used to describe the synthesis of theory and practice by an academic i.e. “...combining reflective practice with scholarship” (Walker 2010).
interweaving theory and practice as a means to progress both. A key aim of this activity is to develop principles for practical use but that have philosophical and theoretical potency too. For the present research the aim is for theoretical and practical outputs that interweave in relation to each other in that each result in further developments through the project rather than the one recording the other’s progress or both being viewed as separate outputs. Consequently, this project should be seen as a research project in total in that each initiative is part of a composite analysis both theoretical and practical.

An academic practitioner must look for pragmatic principles that may take them to new instances to aid their production processes and, very practically, avoid infringing copyright or intellectual property rules. Therefore, there are practical reasons to develop overarching principles. In addition, this research project also applies the academic imperative to seek principles that draw otherwise disparate examples together utilising the concept of interdisciplinarity at the level of theory development to drawing analytical parallels and determine what can be extrapolated from them as common themes. The concept of interdisciplinarity has also stimulated many initiatives between practitioners from different disciplines. For example, NESTA programmes in the UK connect technicians and artists in joint projects (NESTA 2015). However, in both practice and academic

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4 This approach compares with two other modes of practice-led research at PhD level. The PARIP (Practice as Research in Performance) concept was developed by Bristol University Department of Drama: Theatre, Film, Television, with support of the Arts Humanities Research Council (AHRC) (University of Bristol 2012). In this case, a completed artefact/performance/event and the associated documentation of its construction and delivery is required. This compares with the AVPhD at Goldsmiths, University of London. The aim is two outputs of equal status i.e. theory and practice Goldsmiths 2012). There is no requirement for recording of process as part of the outputs.

5 ibid.

6 This standpoint accords with that of Erik Knudsen’s recent inaugural editorial for the Journal of Media Practice i.e. “[F]or me research is research. As practitioners in HE we need to think of ourselves as first and foremost as researchers. [W]e - as practice researchers - are broadly trying to add new understandings and new knowledge to media practices, processes, contexts and media’s engagement with other subject areas and forms” (2015 p. 179).

modes, these connections are often expedient, localised and time-limited with no remit to develop wider principles. Cathy Davidson, Professor of Interdisciplinary Studies at Duke University, describes this outcome as “multidisciplinarity” (Davidson 2010, pp.215-16). Connections are made but these are transient and “there is no actual transformation”, no drawing together of ideas into overarching principles that could be utilised by practitioners or academics or academic practitioners. However, the proposal is that such interdisciplinary inter-connections can be developed through an academic practitioner perspective, interweaving theory and practice to elucidate the forms of activity of people with technologies in environments, assessed in situ.

It was from the standpoint of wishing to site such activities, drawing on the experiences from the KVS Research Group’s installations/performances challenging the limitations of the term “interactive audio-visuals” as an area of study, which resulted in the discovery of the concept of “responsive environments”: “responsive” in the sense that some form of computer technologies are present and sensing/recording/reacting to people, and “environment” in the sense that these activities are located in a place and that that place matters in terms of setting the scene, housing the technology and the people. Initial investigations of term “responsive environments” found instances in performance, art installation, galleries, museums, learning environments, public art, architectural enhancements and urban design, yet with little cross-referencing between them. Thus “responsive environments” constitute an area of study as yet underexplored. Furthermore from the personal perspective of an academic practitioner the concept of responsive environments seems to offer a fertile ground for analysis in terms of helping to define, critique and develop interactive audio-visuals in the context of sites. If there are opportunities to

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8 This is partly due to the functional/commercial remit of such initiatives. For example, one of the “success stories” on the NESTA website features a “Zombie Fitness Running App” by Adrian and Dan Hon, assessed only in terms of its commercial viability (Hon 2016).
create a synthesis of principles from these different sites then it is worth the academic energy to attempt to create it.

1.1 The Area of Study and the Applied Aims

Thus responsive environments are proposed as the area of study for this research process. The responsive environments as analysed in the literature review rely on synchronous interactions between people and computer controlled manipulation of projections (cf. Krueger 1977) or sounds (cf. MEDIATE 2004) or physical components (cf. Dekleva et al 2002). However, the use of practical experimentation can be both in terms of assessing the concept as is but also seeking to develop that concept further. This has been the process applied after the initial discovery of the responsive environment concept. The initial inclusion of Augmented Reality components in the first practice project reproduced a synchronous form of responsive environment but using a technology not seen in the literature review. A desire to critique and extend the responsive environment concept has resulted in an examination of how users/visitors to an RE can do more than simply receive information/entertainment. The shift from participant to protagonist through supportive technologies enabling both synchronous and asynchronous interactions extends the definition of what a responsive environment can be. It expands the area of study to include aspects of online interactions again not found in the literature review. These online interactions draw upon contemporaneous activities in Mixed Reality and Locative Media. Yet they are still sited in specific ways in relation to a responsive environment. This process of first encountering, then assessing and then expanding the area of study of responsive environments has generated a succession of aims for the PhD research as listed below. These aims have developed in the following manner i.e. successively:

1. To critique existing examinations of the area of interactive audio-visuals.
2. To explore the existing uses of the term “responsive environments” through a detailed literature review exploring the principles and technologies applied.

3. To consider contemporaneous initiatives that may be relevant to the concept of REs, specifically Augmented Reality, Mixed Reality and Locative Media. Importantly these formats operate across synchronous and asynchronous interactions.⁹

4. Extract out themes within from the research as developing area of study in particular in relation to the user/visitors apprehension and involvement in REs.¹⁰

5. Test the currency of these themes across three practical projects, each incorporating protocols from the contemporaneous research as required by the development process.

6. The first project to investigate the use of Augmented Reality as a component of an RE i.e. a synchronous technology. The Mad Hatter’s Mirror Project at the Dimbola Lodge Gallery, 2013.

7. The second project to investigate the delivery of content into online repositories on social media, constituting a digital layer over an RE and thus a Mixed Reality format. This supported asynchronous interactions i.e. respondents were first commissioned to collect content and then upload it to Facebook and Twitter over an extended timeframe. The Wild Things in Captivity Project at the Bestival Music Festival, 2014.

8. The third project to investigate the synchronous and asynchronous interactions enabled through a digital social layer whereby users/visitors are given tools by

⁹ See the Literature Review section for an exploration of other practitioners working with social media and related technologies.
¹⁰ The term “user/visitor” is used as this encompasses people interacting with screen-based media and installation-based media.
which they can make a connection to a real place and facilitate an extended form of RE. The #LoveWight Project on the Isle of Wight, 2015.

9. After the examination of the three formats across the three projects there was a further discovery of principles regarding the relationships between people, computers and environments in a cybernetic relationship which stimulated a further aim:

To draw up principles by which responsive environments protocols that provide clear guidance for further investigations and could be of use in other domains e.g. Augmented Reality, Mixed Reality and Locative Media.

Thus the research focus has developed overtime and an argument has been made for the extension of the area of study to include the concept of protagonist, synchronous and asynchronous interactions and a use of cybernetic systems analysis as a starting point for further practical and theoretical research.

1.2 The Contributions to the Area of Study

The major contribution of this PhD research is to challenge the use of the term “participant” with the extension “protagonist” to better represent the positions/roles that can be enabled through responsive environments. This phenomenon, seen as an interesting by-product by Lozano-Hemmer in his Body Movies project, became a key component of the PhD research. Forms of agency enabled in such REs go beyond that of participation and are better described as people adopting the role of protagonist drawing on Moore and Anderson’s concept of “productive”, Floridi’s application of “supervisor”, Bishop’s use of “activation” and Pask’s terms: “...catalyst and arbiter”.

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The second contribution of this PhD research is the extension of responsive environments to include both synchronous and *asynchronous* interactions. These additional opportunities are made available by the allied use of digital layers or digital social layers. A digital layer can offer an archive of content produced and enable further responses to that content both synchronously and asynchronously. A digital social layer can support immediate and later social interactions around content created in the responsive environment. These layers support the development of the “spatial self” (Schwartz and Halegoua (2015) relating online digital expression to “offline physical activities” (2015, p.1).

A further contribution is the use of the cybernetic theories of Gordon Pask (with assistance of a number of named colleagues) who initially appears in this research as a purveyor of an early form of interactive audio-visuals, The Musicolour Machine, then in offering “mutualism” and “concept production” as aspirations for interactive systems, through to offering criteria for the development of responsive environments and then, via the discovery of Paul Pangaro’s Paskian archive, as a source of a sophisticated cybernetic system for the sharing and using of concepts that enhance environments, lastly, as proposer of “cybernetic mutualism” supporting concept production within responsive environments through the obtaining, using and making of concepts, that can be further supported through online digital social layers both synchronously and asynchronously.

**1.3 Key Methods Applied in the Research**

**1.3.1 Secondary Research in the Area of Study**

This research process had two distinct phases. The first phase was to extensively research the area of study with a provisional title of interactive audio-visuals as applied in installations and performances with the express aim to develop
principles that inter-connected these activities. This process unearthed the concept of responsive environments but also pointed to the further disparate nature of the studies produced in that area. The outcomes of this secondary research were the concept of responsive environments, common themes relating to REs, the tentative notion of “protagonist” and a desire to test these themes and this notion in practice through research questions.

1.3.2 Grounded Theory

The second phase focussed on the three practice projects to elucidate data regarding the developed themes and the notion of “protagonist”. The grounded theory approach, developed by Glaser and Strauss (1965; 1999) was adapted for the purpose of this research. The focus in grounded theory is empirical data to develop theory i.e. “generating a theory involves a process of research” (1999, p1) rather than the predetermination of a result to be proved through research. Importantly grounded theory is focused around sociological phenomena and initially this PhD sought to apply standard techniques to access data i.e. questionnaires and data gathering. However, the principle of doing practical research to uncover data that support, develop and/or discover theoretical approaches is part of an academic practitioner approach as applied here even when there is a move into more creative methods of data capture through, in this case, a digital social layer. Furthermore, the wish to understand the opportunities for people in relation to responsive environments is more in terms of creative possibilities as participants and perhaps protagonists.

1.3.3 An Academic Practitioner Approach

The reason for the focus on creative possibilities is that it makes the most sense for an academic who is also at the same time a practitioner i.e. the practical, grounded, research is not conducted only to uncover theory which then becomes
the sole focus. The research is conducted so that the researcher can have a better understanding of their own practice and that that understanding may offer others an insight into the inter-relation between similar practice and theoretical frames that can inform and further develop that practice. Thus there should be an academic purpose to practice and theory can come from practical activity: “...combining reflective practice with scholarship” (Walker 2010). However it is important to emphasise that the relationship between theory and practice may vary through differing practice opportunities and, as in this case, specific procedures were applied in relating practice to theory and theory to practice (see section 2.3 below “The relationship between theory and practice” and section 2.5 “The specific methods applied in the research”). The specific practical research moved from a standard form of responsive environment to first an RE with a digital layer as archive of content to an RE with an active digital social layer enabling the exploration of an asynchronous as well as a synchronous from of interaction in relation to a responsive environment.

1.4 Initial Investigations

Initially this research project was concerned with developing an over-arching theoretical framework offering a lingua franca across the area of study. Concurrent with this first phase of the research project development, a major initiative was instigated by academics that seemed to offer just such an approach and a starting point for further research.

It was an academic initiative begun in 2009, entitled “See this sound” and led and edited by Dieter Daniels and Sandra Naumann from the Ludwig Boltzmann Institute in Linz, Austria, that seemed to offer an over-arching approach to the area of study. The output from this initiative was considerable: three academic books (Daniels and Naumann (Eds.) 2010, 2011; Rainer et al 2009), a gallery-based exhibition (Lentos Kunstmuseum 2009) and an online database (See this
sound 2015). This was a sustained attempt to provide definition: where “See this sound” was used as strapline for the project, then “Audiovisuology” was offered as a term to span/define the area of study in terms of sound and vision. The 58 scholarly articles, 235 printed examples of artworks, over 1200 online artworks and over 1500 people referenced online, evidences a project with considerable scope. It seemed that this extensive project could offer a context for the PhD research. One focus within the project was an assessment of the documentation of “audiovisuology” in compendia. This is an important issue from an academic practitioner perspective, in terms of how to document one’s own work and how to get the most from work that is produced by others. The very interactive nature of these projects makes compendia a challenging issue.

There have been attempts at exploring the area of study through compendia, either online or in hard copy. These compendia are collections of instances under what are often arbitrary sub-headings (cf. Lovejoy 2004; Wands 2007, Bullivant 2006, and Lino, Salem and Rauterberg 2010). These compendia are surface level captures of the visuals of an installation together with a description. They are presented/captured in the same way that a film review would be i.e. stills from the experience with a written description of the particulars of the “plot”. They do not get into the principles of the area of study.11 It is into this context that the ‘See this sound’ initiative arrived and the research team are aware of the prevalence of compendia. Indeed, one of their books is called Audiovisuology Compendium and the website database is also called a “Compendium” (Daniels and Naumann 2010, See this sound 2015). Yet it is significant that this major enterprise takes time out to examine and critique the role of cataloguing. Daniels and Naumann identify two models:

11 There is, of course, the considerable challenge as to how to archive live projects such that posterity can interact with them and thus understand the processes involved Wardrip-Fruion and Montfort’s The New Media Reader (2003) offers some means through emulation and video documentation - http://Figure.newmediareader.com/. This is also part of the net art community site Rhizome.org’s remit (Rhizome 2015).
The first is a linear history of progress, which is orientated on the actual feasibility of the audiovisual and the technology that in the last approximately 150 years has brought forth the modern media-oriented society. (Daniels and Naumann 2010, p.9)

The second model is a history of perennial ideas, whose origins reach back into the ancient world; however, because these themes experience a revival in topicality from time to time, this leads to the constant recurrence of certain motifs, sometimes as conscious resumption and sometimes as naïve reinvention. (Daniels and Naumann 2010, p.9)

Whereas the first model is presented in an apparently neutral manner, one of successive development, the second model carries with it a number of interesting and, potentially concerning, value judgements. Yet there is much to critique in both models.

The concept of progress in the area of study seems apt in that technological constructions have been increasing, e.g. in speed of processing, in range of hardware and in modes of public accessibility overtime. Processing times, sensors and networking opportunities have, without doubt, increased in number over time. However, an example, mentioned within ‘See this sound’, questions the conflation between technological advancement and what can be done with that technology.

The example is the Musicolour Machine, developed from 1953 by Gordon Pask Sheila McKinnon Wood, Elizabeth Pask and Robin McKinnon Wood with contributions by John Brickell and Jone Parry using valves and analogue signals.\textsuperscript{12}

\textsuperscript{12} This reference, supplied by Bob Cotton, was the first encounter with Gordon Pask and colleagues.

The inspiration for the machine came from references across poetry, music, musical instruments and a feature film:

[A] work can be enhanced if the work is simultaneously presented in more than one sensory modality. This notion is old enough. Baudelaire played with it in 'Les Fleurs du Mal'. Scriabin wrote a part for a 'light keyboard' in one of his symphonies and Kleine (among others) realized a 'light keyboard' in the metal. Walt Disney'S Fantasia (1940) is a synaesthetic film. (Pask 1968, p.77)

This was a device designed for use in performance that responded to a musician's playing to produce a range of colour effects but that also contained feedback loops (from Gordon Pask’s interests in cybernetics) that could respond to the playing by the musician in complex and conversational ways. The Musicolour Machine appeared in a number of venues to varying degrees of success (Pask 1968, Pask and Curran 1982). The complexity of feedback and real-time responsiveness of the machine is, to this day, exceptional:

Performers became addicted to Musicolour. By adjusting the filters it looked for variations on the status quo, that is any original tune, rhythm, key and so on. The status quo was established by adjusting complex oscillators so that they resonated with the performers. (Pask and Curran 1982, p.144)
It is the case that there may not be any latter-day practitioners working in the area of study with such levels of responsiveness available to them in their digital technologies. This can be contrasted with Daniels and Naumann’s assertion that: “The actual breakthrough to the universal formability of the audiovisual did not occur until the 1960s with analogue electronics...” (Daniels and Naumann 2010, p.11). This confirms a considerable under-estimation of the advances Pask had made in the Musicolour Machine a decade before.

It is clear from Pask’s example that, for the “See this sound’ project, there is a need for a revision. This is the case, in the sense of what was actually possible when, specifically in terms of the principles applied. However, Daniels and Naumann look back over history from a position that enables them to come to a surprising conclusion. They view attempts at making audio-visual constructions as “a history of permanent failure” (Daniels and Naumann 2010, p.13). This is qualified with reference to audio-video synthesizers and everything before. However, there is no championing of any specific examples, at the time of their writing, that move on from that history of failure. More importantly, putting to one side the veracity of their claim (cf. Pask’s Musicolour Machine) they offer no criteria/principles as to how they come to that conclusion. From the perspective of a technological catalogue the outcome of the “See this sound” thesis is that constructions over time have offered hints at the successful integration of sound and image but no more. Thus the format of a compendium is quite valid - all examples can be included but no conclusions drawn from the collection.

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13 This is difficult to state as a fact. However, artists working today in interactive-audiovisual performance e.g. D.V.D (D.V.D 2015), KikiT VisuoSonic (KikiT VisuoSonic 2015), NoiseFold (Noisefold 2015) and VJs using Ableton Live (Ableton 2015) (e.g. MIST (MIST 2015)) all use less sophisticated systems i.e. non-learning systems. It is further interesting to note that Pask et al initially focused on synaesthetic effects then moved on to the facilitating the feedback loop between musician and system, stages of development also taken by KVS Research group but five years before the discovery of the Musicolour Machine.
Returning to the second model offered above there are further contradictions and assertions. The first model is characterised by “the history of permanent failure”. The second model has the more benign phrase of the “history of perennial ideas”. This is a common trope in the sense that themes do recur throughout human history but it is the historical specificity that determines the differences in their meaning and consequences. However, Daniels and Naumann (2010, p.14) do not see this as a good thing: “In the history of image and sound relations...there are numerous examples of artists and inventors hitting upon innovative ideas and realisations without being aware that they are in fact part of a long tradition”. It is also important to note that Daniels and Naumann (2010, p.15) are not only talking of distant ‘uninformed’ times: “Up until the present day, audiovisual products and software continue to be touted as absolute innovations and ‘revolutionary fusions of the senses’”.

At one level, their point would seem valid. It is important for academics to be aware of the whole catalogue through time and to point out where developments have reoccurred and examine the relative significance of them. Furthermore, as referred to above, practitioners, working within academia and beyond, must understand the global and historical contexts in which they work, if only to address issues of intellectual property. However, from the perspective of synchronicity is it not also possible to see separate and “uninformed” developments as indicators of the value of the activity, the persistence of the activity and the attraction of the activity? It is difficult to avoid the conclusion that Daniels and Naumann are offering a fairly weak argument as to why they have the right approach to the area of study and all others are either copiers or naïve. One instance in their editorial unfortunately backs up this assertion. Daniels and Naumann offer these ‘recurrences’:

- The 1920s: Absolute Film and psychological research into colour and sound
- The 1960s: Expanded Cinema, video feedback techniques, drugs all

14 This latter phrase is presented as if a quote but is not referenced nor does that exact phrase come up, at the time of writing, in a range of search engines apart from on their own website (See this sound 2015).
These eras are familiar to academics working in the area of study. However, Daniels and Naumann (2010, p.15) then attempt to sum up the significance of them: “While it is not possible to offer an exhaustive treatment of these phenomenon here, they nevertheless illustrate the permanent return of certain fundamental motifs - some as intentional historical references, some as naïve reinventions as mentioned above”. If the simple alignment of different eras, with different social, historical, political and economic contexts is forgivable then the lack of explanation as to the meaning of “motifs” is not. Daniels and Naumann could establish some principles regarding common ground across differing expressions of the area of study but leave the reader wondering what their terms of reference actually are. An explanation is offered earlier in the editorial, although this is again somewhat contradictory. They state (2010, p.15):

One of the main reasons for these permanent reinventions is the fact that a history of audiovisuology does not exist, because due to the fact that image-sound couplings reside in a state of in-between, there has been no development of a specific theory or aesthetics and no canons have been established.

So the plea is that as audiovisuology is an interdisciplinary form it sits in-between and thus is difficult to define. Yet, they themselves refer to ‘motifs’ that translate between instances. These motifs could be a means of bridging this interdisciplinary gap. But no, the present tense is used: “a history of audiovisuology does not exist...” (Daniels and Naumann 2010, p.15). This stance might make some sense from a postmodern perspective of pluralism but that is of little use to the very practitioners who are represented in all the compendia, the articles, online databases, etc.
Practitioners are theoreticians too, operating through local principles both technical and intellectual. They both require, and use these principles, in their constructions. These principles may be immanent within the work but that does not mean that they are inaccessible or non-comparable or non-objectifiable. It is precisely the seeking of principles of use in analysing, and in producing work that an academic practitioner should be engaged in. This is the purpose of this PhD research.

Thus, the response to Daniels and Naumann’s *fait accompli* is as follows: The key is to understanding the processes at work in the construction, delivery and reception as offering means to cross-compare principles in the area of study. The proposal is that there is a need for definitions drawing on the experiences and activities of practitioners. This is in part the championing of role of such dual-focused people. This is a move from the recording of outputs only to the inter-relation of theory and practice through the processes of production to search for underlying principles and thus move on from relativism, and the lure of the compendium. The stance of the “See this sound” project offers little in this regard. There is, however, one fragment that attempts to analyse some underlying principles/criteria of practice in the case of the concept of interactivity. It is proposed that the principles of interactivity offer a productive starting point to explore the commonalities across the area of study as all the constructions interact with their users.

1.5 The Concept Of Interactivity

Katja Kwastek’s “Audiovisual Interactive Art: From the Artwork to the Device and Back” (Kwastek 2011) attempts to develop criteria in the area of study in ways

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15 This is not that the creation of databases, compendia or chronologies is a bad idea. However, in the same way that an historian would create a chronology of events as a starting point in a historical study and then examine the principles at work in the development of those events, such aggregations are, equally, only starting point. See the literature review, below, as a case in point.

16 This approach does draw on previous research conducted (Richards 2006).
that could map across different systems. Kwastek challenges the passive “See this sound” formulation using the more dynamic term “audiovisual interactive art” instead. Thus there is a reorientation of the recipients of sound and visuals from witnessing to interacting and, potentially, moving away from the assumption of a passive audience.

In her paper, Kwastek utilises Aden Evens’ concept of “resistance” in music. Evens relates virtuosity to overcoming resistance in a music score. Kwastek applies this idea to a user coming to understand an interactive installation i.e. the user needs to overcome the resistance of the interface. This is an interesting idea. However, one could equally say, that a user must understand and work with the enabling qualities of an interface. Kwastek focuses on the concept of “apparatuses” as an insertion into the relationship between artworks and people. Apparatuses enable interactivity, experience and outcomes e.g. Kwastek cites “Toshio Wai’s TENORI_ON, a portable panel with 256 LED switches that allow programming, playing and visualisation of the melodies all at the same time” (2001, p.159). This perspective focuses on the processes of production of “audiovisual interactive art” and offers some analytical tools of use in practice and at a more academic level. The problem with this approach is that it places the technology, the apparatuses, at the centre of the research. Although Kwastek acknowledges that participants are in fact needed, the focus on apparatuses underplays the role of the participants and the content of the installations. This emphasis i.e. uncovering what the interactivity is focuses on how the system works. Indeed, Kwastek states this explicitly: “[T]he real reason for the existence of the interactive artwork is the process of interaction itself” (2011 p. 154).

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17 Kwestek’s paper does not reference across the themes of “audiovisuology”. Indeed, the term is not referenced.

18 With the emphasis on constraints it may be that Kwastek is view these interfaces through a designer’s rather than a user’s eye (cf. Moggridge 2006).

19 This can be compared with the musical equivalent of the complexity of the notation as the device as opposed to the sound produced and the variability of the output through the interpretation of the musician. Musical notation is a apparatus but also a means to another ends.

20 This is very reminiscent of Myron Krueger’s focus (1977, 1983).
However, this only makes sense if the point of these systems is forgotten i.e. they are *content-delivery systems* (cf. Richards 2006). There is something on offer *through* musical notation or digital interfaces. The “resistance” to the *concepts* on offer should be of equal concern to the practitioner as the resistance to the technology. The point of an installation is not to work out what buttons to press only but to be inculcated into some form of concept, experience or learning opportunity or to enjoy the content for its own sake. A system can interact with users and deliver content to them in stimulating, supportive and/or challenging ways. The significance of the content structure *and* the delivery system do need to be acknowledged to avoid presuming to deliver content in a “hypodermic needle” sense.\(^{21}\) More positively for Kwastek’s concept, Pask’s Musicolour Machine did have a form of *dynamic* resistance in its capabilities i.e. it exhibited a form of boredom when a musician continually repeated a phrase (Pask 1968, p.80). After several repeats sensors in the machine would reset to a different range and thus the musician was stimulated to play new refrains. This could be described as a “resistance to repetition” but equally as “enabling variety” in the system. However, Kwastek should be applauded because she has taken the analysis inside the processes of production of audiovisual interactive art. Yet, the shift to the technology’s capabilities with regards to interactivity offers only a means of describing a phenomenon of the interface rather than examining the principles by which a user/visitor may access or perhaps make content.\(^{22}\)

At this time, Gordon Pask’s article for the *Architectural Review* in 1969 entitled “The Architectural Relevance of Cybernetics” was discovered in which he explored an important distinction between different forms of cybernetics. Pask


\(^{22}\) This is perhaps the result of a mix of process and outcome i.e. digital artists will experiment, hack code, even crash contradictory elements together just to see what happens. However, even in this practice there is a need to consider the point of the investigation and thus the point of new forms of content delivery beyond the focus on the technology itself.
drew a division between functional systems (first order) and mutually beneficial systems (second order). In the former case, the emphasis is on the system offered to the participants as a fait accompli - a framework supplied. This system is dynamic but the humans within it could be described as being parasitical to it. The example of a thermostat is a case in point. Thermostatically controlled houses just need a temperature set to regulate themselves. Pask compared this to systems built on “mutualism” whereby the system is designed to continue to interact, respond to, teach and learn from those humans interacting with it (Pask 1969). This is dynamic, generative and, to use a further biological metaphor, symbiotic. Whereas Pask is attempting to understand the human role in dynamic systems, Kwastek is focusing on functional components and whether humans have an awareness of those components. For Pask these components are a means to other ends and, further to that, that those components can be configured to be more than functional. Of high significance is that Pask is asking the question: what can be achieved through interaction?

Within the study of interactivity the concept of mutualism has continued as a trope. Witness Sheizaf Rafaeli’s (1988) definition:

Fully interactive communication requires that later messages in any sequence take into account not just messages that preceded them, but also the manner in which previous messages were reactive. In this manner interactivity forms a social reality.

Rafaeli with Fay Sudweeks describes this process as “supplementation mode” (Rafaeli & Sudweeks 1997) i.e. a conversation is supplemented by reference to elements that occurred earlier in the encounter. There is a human imperative promoted: “Interactivity can be shown to lead to more cooperation” (Rafaeli & Sudweeks 1997) i.e. in Pask’s term, mutualism. It is important to note that Rafaeli, working with a communication studies remit, is not concerned with the specifics of the conversation. However, this can be
compared with Pask’s aspiration for cybernetic relationships in The Fun Palace building proposed by architect Cedric Price and Joan Littlewood (Mathews, 2006). This was to be a building that had the capability of re-forming itself in response to the behaviour of the people using it. In 1963 Pask was invited into the project as Director of the “Cybernetics Committee” to oversee The Fun Palace’s system design. Pask, with among others Roy Ascott, designed systems to affect the visitors to the building. Stanley Mathews has studied the committee minutes and is concerned in terms of Pask’s aspirations for the building in the notes for “unmodified” and “modified” people (Mathews, 2006 p.45-6):

Today, the idea of “unmodified” and “modified” people would make us draw back in horror. Yet, in the 1960s, the prevailing and naive faith in the endless benefits of science and technology was so strong that the Orwellian implications of “modified people” went largely unnoticed.

This reading of Pask’s aspirations for the project fits in with modern day dystopian views of cybernetics, represented by negative popular culture references e.g. The Terminator film (1984). Put more soberly, any installation could be described as a modification system in the sense that, people occupying a space and not being affected by it is practically pointless. However, Maria Fernandez, also referring to the Cybernetic Committee notes, finds that Pask’s focus was on the content that could be generated through relationships between the building and its visitors: "[T]he feedback concerned must resemble the concept-producing discourse of a conversation..." (Fernandez, 2008 p.65). Pask’s emphasis was on possible idea generation that can occur through an

23 Kevin Kelly even writes of the “death of the cybernetic movement” citing desertion into AI research, the need for dedicated computing power and the recursive nature of “observing systems” not being understood by the academic community (Kelly 1995 p.455). Kelly’s summary was stark: “I don’t believe a single formal textbook on cybernetics was ever written in English” (Kelly 1995 p.455). There are a considerable number of books produced by Pask that might fit this bill yet few are still in print (see ibid.). Thus cybernetics suffers from negative representations in popular and academic cultures.

24 It should be noted that, at the time of writing, there was an awareness of Pask’s “Conversation Theory”. However, there was yet to be an investigation into this area in part due to the scarcity of key works by Pask which were and are out of print e.g. Conversation, Cognition and Learning: Cybernetic Theory and Methodology, London: Elsevier Science Ltd (1975).
interaction with a dynamic system. There may be modification but it would have been a two-way modification through conversations with the building. It is specifically this concept that can be taken forward and the negative representations of cybernetics will be left to loop around themselves.

Pask’s and Rafaeli and Sudweek’s approaches may be useful in developing principles relating to the area of study. Kwastek’s analysis looks mechanical and instrumental by comparison. The construction of interfaces and access systems are a key part of the digital artist/practitioner’s scoping and designing of a project. But this developed understanding of the production process and plan of the interface/installation does not logically reveal anything of the purpose of the project. Of much more use with regard to the content delivery component of the construction is to use Pask’s and Rafaeli’s and Sudweek’s criteria i.e.

What is being supplemented for the user in the construction?
What concepts are supported/produced through the construction?

The next discovery was Usman Haque’s contribution to an exhibition exploring the work of Gordon Pask entitled “Pask Present” held at the Atelier Farbergasse, Vienna, 26th March - 4th April 2008. His paper “Architecture, interaction, systems” sought to relate Pask’s notion of interactivity to architecture (Haque 2008). At first the paper seems to be arguing for an analysis similar to Rafaeli and Sudweeks: “[I]nteraction concerns transactions of information between two systems” (Haque 2008, p.100) and “[T]hese transactions should be in some sense circular...”. There is “supplemental” relationship built on referencing between the two systems. However, Haque complexifies this notion with “Multi-loop interaction” that “depends upon the openness and continuation of cycles of response”, with the added, significant component of “the ability of each system,

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25 The Fun Palace was not built due to a number of planning problems outside of the control of the group (Mathews, 2006 p.47, fn.2).
while interacting, to have access to and to modify each other’s goals” (Haque 2008, p.103). Thus, this is a much more Paskian approach, although Haque does not reference Pask’s notions of “mutualism” nor “concept production”. This is the developing of qualities through a user/visitor interacting with an environment. In the spirit of the latter two notions, Haque offers the following prescription (geared towards architecture):

> It is about designing tools that people themselves may use to construct (in the widest sense) their environments and thus to build their own sense of agency. It is about developing ways to make people themselves more engaged with, and ultimately responsible for, the spaces that they inhabit. It is about investing the production of architecture with the poetries of its inhabitants. (Haque 2008, p.107)

Aspects of this prescription will be explored below. However, it is important to state at this point that these investigations into interactivity and the purpose of installations point to principles that are outside of the scope of the “See this sound” project as it replicates other studies that have collected material together but not offered a means of synthesising principles from that collection (e.g. Lovejoy 2004; Zilczer et al 2005). This research project’s response to this tendency is a sustained theoretical and practical investigation that seeks to develop generalisable theoretical principles. This practice-based approach seeks to apply an experimental rigour to the development of principles (cf. Barrett and Bolt 2010; Smith and Dean 2009), a means of generating new approaches, both theoretical and practical, offering an alternative format to the compendium that has become the norm. Barrett and Bolt describe this process as a “...double articulation between theory and practice, whereby theory emerges from a reflexive practice at the same time that practice is informed by theory” (Barrett and Bolt 2010, p.29). It is hoped that this protocol will enable this research project to develop principles of use in the area of study.
1.6 The Discovery Of The Responsive Environments Concept

It is proposed that there are principles that can be developed and that the parties across the area of study could find those of value. Thus, the concept proposed is “responsive environments”. This is proposed further to the above research into the area of study and a reaction to the “See this sound” project, with its concentration on sound and vision, rather than emphasising the activity within a location. It is important to note that responsive environments seemed to explain the practice engaged in by the KikiT VisuoSonic Research Group at Southampton Solent University. However, these two words were explored as a hypothesis i.e.: The concept of responsive environments can effectively describe the various forms of process and output of interactive audio-visuals.

It was only after researching the concept, cf. Chapter Two, that the existence of the term across performance, installation, museum and gallery-based work, public works, urban planning, architecture, education and more became apparent. Responsive environments investigations have explored the motivation of users, the concept of interactivity, the position of user in relation to the construction, the design of construction, locative aspects of a construction and the values conveyed in the content. Yet, there has been very little cross-referencing between these investigations. These are specific examples of the “siloing” of research. This challenges the development of common principles, as Cathy Davidson puts it, “silos” of “…distinct and separate organisational units” that each have their own agendas yet each may be using similar principles (2010 p.215). This can be within the academy but also between the academy and other extra-university institutions across both public and private sectors. The organisational perspective is to seek to understand how these separations occur and seek to over come those structural problems. However, this PhD research

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26 Note that the word “discovery” is used in the sense that Columbus “discovered” America i.e. this is a personal discovery rather than a unique one.

27 For example, Lentsch calls for the development of “boundary organisations” to mediate between institutions using different registers/protocols (Lentsch 2006, p. 2).
perspective seeks to compare the processes at work and attempt to draw out commonalities from that analysis. Therefore, there are opportunities for cross-comparison that are both ground breaking and potentially of importance to the understanding of the area of study. The strength of this approach comes not from the uniqueness of the responsive environments concept but because the concept is already in isolated use. This approach goes beyond the look and the sound of performances, installations, exhibits and art forms or the simple collection of instances in compendia. The focus on responsive environments begs important research questions that were in the most part avoided by “Audiovisuology” initiative:

Whom or what is responsive?  
What is the influence of the specific context of the environment?  
What are the outcomes of these combinations?

This leads onto the initial research question:

Is it possible to find common thematic links between the disparate investigations into the concept of “responsive environments” that enable the synthesis of a developing theoretical framework and a further testing and development of that synthesis through practical experimentation?

The aim is to extend the analysis to include the role of users and contextual analysis under the general heading of responsive environments.

1.7 The Lozano-Hemmer Experience: Body Movies

Before moving onto the literature survey it is important to examine a key reference with regard to questions posed at the end of the previous section. Rafael Lozano-Hemmer’s Body Movies (2001) consisted of an outdoor projection
onto large buildings using a low-key angle to project passersby shadows at gargantuan sizes mapped to pictures of people in street scenes.\textsuperscript{28}

![Figure 2: Still from video document of Body Movies (Lozano-Hemmer 2001).](image)

Once all the pictures had been revealed through the shadows of the participants a new scene of people was offered. Therefore, the system itself was comparatively straightforward and locked; the passersby could affect none of the parameters. However, as can be seen in Figures 3 and 4 below, this locked nature did not stop the passersby from exploring other possibilities. A “giant” quenches the thirst of a little person and a chain is made of people in decreasing size. Very importantly, Lozano-Hemmer was aware of this repurposing and saw it as a positive outcome (although strictly speaking there was no way of discouraging it):

[With Body Movies]...on the one hand you can have the discrete individual participation, as one’s shadow is recognizably one’s own; but there are also emerging collective patterns of self-organization, as people may choose to interact with one another, with the building or with the portraits. Lozano-Hemmer Interview (Lozano-Hemmer 2002).

\textsuperscript{28} Body Movies is one of twenty works that Lozano-Hemmer gives the title: “Relational Architecture”, a term in a similar mode to responsive environments.
It is clear from the audio track of the video documents that the passersby enjoyed repurposing the existing content. It is this form of emergent and self-generated expression that offered indications that what was at work was more then participation in something and that there may be some value in the complementary concept of “the protagonist”. However, it was not until after working through the literature review and the development of a philosophical approach to REs that the possibility of developing the concept of the protagonist came to the fore. As a cautionary note it was noted, however, that Lozano-Hemmer’s cameras were in plain site thus the people in the space may have been “acting up” to those cameras (cf. The Hawthorne effect, Gillespie 1991).

Figure 3: Still from video document of Body Movies (Lozano-Hemmer 2001).

Figure 4: Still from video document of Body Movies (Lozano-Hemmer 2001).
Furthermore and importantly, apart from video documents, there was no sustained presence for the content. It was time-locked as well as content-locked. Yet, the passersby clearly got enjoyment from the experience and in many cases by ignoring the stated purpose of the project.

1.8 Conclusion

Further to these initial explorations of the developing area of study of responsive environments, Chapter Two will explore how the concept of RE has been approached through different investigations over the last 50 years. The aim is to assess whether the concept of RE can illuminate further the dynamic relationships between users/visitors, digital interactive technologies and environments and so move the focus of the area of study on from taxonomies, chronologies and compendia.
2.0 Chapter Two - Methodology and Design

2.1 Introduction

This chapter will explore the specific academic practitioner methods applied in the research process both in terms of design and development of theory through practice and the design and development of practice through theory. This is an expression of a journey through a progressive development of methods. At each stage of the development of the research there was a need for considerable reflection on the theoretical and practical implications of interim discoveries. In this regard Donald Schön’s concept of reflection-in-action is relevant here. This is examined in section 2.2 below. The relationship between theory and practice is a key concern of academic practitioners and is specifically explored in section 2.3. The general protocols for the designing of practical work as applied are detailed in section 2.4. This leads onto section 2.5 with an account of the specific methods used in the research in terms of theoretical and practical development and the evaluation of that development in section 2.6.

2.2 Reflection-in-action and the Academic Practitioner.

Donald Schön’s The Reflective Practitioner provides some context for the present research (Schön 1991). Schön’s strategy is to compare a Technical Rational approach with its certainty of “instrumental practice” to his notion of “reflection-in-action”. In the latter case it is only in the actions of practice that the outcomes become clear. Furthermore, there is often a need to reframe consequent problems because of that imminent analysis in situ:

[T]he practitioner’s effort to solve the reframed problem yields new discoveries which call for new reflection-in-action. The process spirals through stages of appreciation, action and reappreciation. The unique and

29 This chapter has specifically drawn on the work of the Research into Practice Group at the University of Hertfordshire in providing guidance through associated papers.
uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it (Schön 1991, p.132)

Rather than rolling out a plan to simply confirm or deny preconceived outcomes the aim of this academic practitioner research is to uncover new phenomena through practical experimentation and new ways to describe and analyse that practical research through theoretical experimentation. The reframing that takes place can either be in response to novel outcomes from practical research or through the transformation of theoretical frameworks through the synthesis with newly discovered concepts. Furthermore, the reframing may be because of an application of novel theories in practice or the application of the practical data to existing theories. As will be seen below qualitatively different data has been gained from each of the three practice projects as a result of the scenarios created but the forms of that data could not have been predicted. Following Giddens the forms of engagement are as significant as the specific types of content (Giddens 2014). Indeed, the qualities of engagement include both the participation in the apprehension of content and, in some cases, protagonist behaviour that reinterprets or repurposes or recasts that content. The concern to capture these activities came in response to the way that interactive audio-visuals are represented in online and offline archives without due reference to those forms and qualities of interaction. A key response to this inadequacy was the reframing of the notion of RE to include an online digital layer in the instance of the second practical project and an online digital social layer in the instance of the third practical project. The implications for the concept of an RE regarding this reframing to enable asynchronous as well as synchronous activity is examined in the next section.

2.3 The Relationship between Theory and Practice
The following description clearly shows the oscillation through the research process between theory and practice.

This thesis builds on the experiences gained through previous practice projects with particular reference to the last major project developed before the PhD research. The KikiT VisuoSonic Research group devised and built “The 11th Tapestry” project at the Victoria and Albert Museum for the London Design Festival 2010. This project, working to a brief of drawing more visitors to the tapestry gallery, enabled *synchronous* interaction between aspects of the ten tapestries in Gallery 94 of the V&A through movement and sound displayed in an installed “digital tapestry”.  

It was a key project stimulating a growing awareness that the interrelationships between digital technologies and real spaces could be constructed in a complementary manner, they could be *sited*. Furthermore, it pointed to a need to define what these interrelationships were and enable the conceptualisation of principles of application. These experiences led into the use of the concept of “responsive environments”. Thus the starting point of the research was an outcome of practice. A further key aid to the thesis’ development was Pask’s concept of mutualism (second order cybernetics) as opposed to functionalism (first order cybernetics) as explored in an article in 1969 (Pask 1969). This provides criteria by which different forms of responsive environment can be judged i.e. is the interaction “functional” in the sense of stimulus-response or “mutual” in Pask’s sense of both people and computers learning from the interaction? Furthermore this approach formally acknowledges the different *qualities* of interaction that may be available. The shift from functional to mutual increases the opportunities for both computers

30 Here it should be noted that *synchronous* interaction was the only form that the research group had worked within i.e. live performance or gallery-based installation whereby sound and movement interacted in realtime.

31 Clive Cazeaux in his paper “Locatedness and the objectivity of interpretation in practice-based research” (2008) argues that is through siting that an objective understanding can be obtained. The possibility of a better understanding regarding the making of effective RES is the primary concern at this time. The idea is explored as the research continues as it is supported through the notion of “spatial self” Schwartz and Halegoua (2015).
and people to interact. This taken with the concerns regarding the See This Sound initially, spawned the notion of “the protagonist” as an extension of the convention use of the term “the participant” i.e. the latter may conduct a function within an RE but if there is mutuality then there is more at work than simply taking part in an existing format. This assertion required testing and the approach taken was to begin with a practical project that offered no apparent means of “protagonist” input. This is a reproducibility approach (cf. Harald Atmanspacher and Sabine Maasen 2016) further to Lozano-Hemmer’s unexpected outcomes in his Body Movies project, see section 1.5 above. The Mad Hatter’s Magic Mirror used tablet-based augmented reality overlays to apply masks to people’s heads. Questionnaires, comments, photographs and video were used to gather data from respondents. Following van Leeuwen (2001) iconographic analysis could assess qualities expressed in the visual data. The questionnaires and recorded comments were assessed using the “analytical memo” approach (following Jonny Saldana’s The Coding Manual for Qualitative Researchers 2014). The outcomes from this first project gave indications of such protagonist behaviour sufficient to warrant further investigation. At this point further reflection was applied to the forms of output possible within a responsive environment. All of the examples from literature review were built on synchronous interactions i.e. the computer system immediately responded to the activity of the people within that environment. However, the indications from the research into contemporaneous initiatives pointed to the possibility for the inclusion of other facilities. What if the functional or mutual response was stretched over time, facilitated by digital storage systems enabling asynchronous interactions? This could enable responses both inside and outside of the RE over an extended period. Indeed, even after the RE itself had be dismantled. Seth Giddens’ research, using microethnography techniques has focused on these possibilities, specifically in his case the playing out by his two children of digital protocols, in later, real world scenarios (Giddens 2014).\footnote{Giddens works through microethnographic techniques use small scale deep studies to elucidate information about a phenomenon (Giddens 2014, p.54-66.)}
a range of concepts to describe this move and offers “transduction” as the most fitting. Transduction, a term used in cybernetics, in this context means the conversion of one stimulus from one medium into another. The significance of this definition is that it acknowledges that while a stimulus moves into a new setting it still contains the original message. For Giddens this process was asynchronous to the original stimulus because there was some time between playing a game on screen and then using that terminology in real world play. In his children’s case the bringing of video game terminology into real world play enhances that experience, it does not replace it or negate (Giddens 2014). This interrelation between digital content and real world spaces also accords with the work of Schwartz and Halegoua (2015) and their concept the “spatial self” (see section 3.7.3 below): to use Giddens’ term there is a transduction from digital representations to activities in real spaces. It was in this spirit that the reframing of the concept of RE was examined.

Drawing on extensive experience in web platform development and teaching of social media the proposition was put forward that Twitter, Facebook and Instagram could act as storage systems for content relating to an RE and enable similar enhancements to Giddens’ experience including real world effects. This was a transformative step both in terms of the concept of RE and the research position taken as an academic practitioner as all previous practical projects had been gallery or theatre based. This reframing (cf. Schön) offered opportunities to advance the concept of RE and reinvigorate personal practice at the same time. However initially the transduction would be from the RE into a digital domain as an archive, enabling the continued appreciation of the projects output both spatially and temporally outside of the RE. The second practice project “Wild Things in Captivity” at the Bestival music festival 2014 worked to this remit. Envisioning the Bestival site as a safari park opened out a range of scenarios relating to conservation and nature watching that were rolled out over the four days of the festival. Each scenario called for content to be gathered at the festival and uploaded to related Facebook and Twitter accounts, an example of
crowdsourcing i.e. in this case asking respondents to submit the content of the project (Ooman, J. And L. Aroyo, 2011). An example of this was the “Habitat Renewal” initiative whereby pictures of cleared campsites could be uploaded to show renewal of habitat but also encourage other people to do the same. The aim was for “transduction” in both directions through this process i.e. the camp site would be cleared the picture uploaded and then, possibly, influencing the clearance of further campsites. In this way asynchronous interaction could further the project and promote the greening of the Bestival site. Following van Leeuwen (2001) iconographic analysis could assess qualities expressed in the visual data and following Saldana (2014) qualitative content coding could be used for supplied hashtags. However, as with synchronous interaction, asynchronous interaction requires technical support and motivated respondents and there were specific challenges in each case in this project. See Chapter Four and Appendix D for details. Although the amount of content gained was minimal the principle was explored and at least some indications of protagonist behaviour, by playing with the concept, were present. The spirit of this work references Graham Sullivan following Robert Storr curator of the Venice Biennale of 2007, who contends that the “central premise is that art making is a personal process and public practice that is a primary source for creating and critiquing new knowledge that has important individual and cultural value” (Sullivan 2008). Therefore the interpretation applied to any findings should be from this perspective.

After this experience a considerable amount of reflection took place in advance of the creation of the third project. The literature review had pointed to a lack of philosophical inquiry or even philosophical statements relating to RE. However, Luciano Floridi’s concept of Homo poieticus, a meeting of “physis [nature, the world] and techne [applied knowledge, technology]” (Floridi 2010 pp.17-8) and his call for a move:
...from individual virtues to global values, an *ecopoietic* approach is needed that recognises the agent’s responsibilities towards the environment (including present and future inhabitants) (Floridi 2010, p.17)

provided a way of thinking about the shift from an individual and perhaps functional response to an RE to a means of a mutual involvement supported by digital technologies. Crucially, regarding the concept of protagonist in this context, Floridi further detailed those responsibilities as being the environment’s “...enlightened creator, steward or supervisor, not just as its virtuous user and consumer” again promoting a sense of agency and mutuality and not just a functional relationship (Floridi 2010, p.17). This is further detailed in Chapter Four below. The decision was made to further investigate the use of asynchronous opportunities for interaction through social media but that the content to be “transduced” should be of a simple and closely defined form. Giddens’ children used video game scenarios but also tag words such as “Game Over” that carried considerable energy from one domain to the other (Giddens 2011). For the third project the shape of the Isle of Wight as a hand sign was used together with the tag #LoveWight. This condensed the opportunity to show connections to an island, in danger of losing its identity through “mainland” administration, to a sign representing the island and hashtags enabling respondents to indicate what they loved about the island. This condensation did not prevent some protagonist behaviour with respect to the project. This occurred both in terms of reinterpreting the signs or using the hashtags for other purposes beyond the project. Following van Leeuwen these representations, both visual and textual, can be described as iconological symbols in that they allow a biographical relationship to be made between the respondent and the island (van Leeuwen 2001). The data collected further backed up the use of the concept “protagonist” to describe some of those engaging with the project. There was a local mutuality as content created was responded to or repurposed. Content analysis of the submissions suggested that there was sufficient indictors for further research to be done into the concept of both synchronous and asynchronous protagonist activity. See Chapter Four and
Appendix D for more detail. This was a vindication of the shift from the first two practice projects with their intentions towards a more scientific method of data gathering and the #LoveWight project as the third practice project. Following Jane Tormey and Phil Sawdon (2008), the aim [was] to proceed from the convention of interpreting art, as merely illustrating social, political and philosophical ideas discussed in other disciplines or situating practice within some context, to investigating practice (images, objects and performances) as provoking thought and discourse (philosophically, culturally, politically) and producing forms of knowledge.

That was to be the end of the thesis with a call for further practice-based work to explore the concept of the protagonist in relation to both synchronous and asynchronous supported REs and beyond. However, the discovery of the Pangaro archive and thence the interrelationships between Pask’s introduction to Negroponte’s *Soft Architecture Machines* (Pask 1975b), Floridi’s Internal and External RTP models (Floridi 2008) and Neuhofer, Buhalis and Ladkin’s Technology Enhanced Destination Experiences with additions (Neuhofer, Buhalis and Ladkin 2012) was highly significant. It led to a working definition of REs and a conclusion seeking further theoretical analysis assessing REs potentialities in themselves and in relation to systems either spatially or temporally beyond them, as well as a call for further practical research drawing on these theoretical frameworks.

Thus it can be seen that there has been a continued interweaving between theory and practice through this process with moments of reflection (cf. Schön) followed by further developments of related theory and/or practice.

### 2.4 The General Design Approach to the Research

...
The general design approach to the research draws on the work of Mary Buchenau, Bill Buxton, Jane Fulton Suri, Bill Moggridge, Jennifer Preece, Yvonne Rodgers and Helen Sharpe.

Bill Buxton's approach to interaction design is through the process of “sketching”. This is, in part, sketching with a pencil but also any form of experimentation that explores ideas including the use of computers (Buxton 2007, p.135). In all cases the process should be: “Quick, timely, inexpensive, disposable, plentiful, [have a] clear vocabulary, distinct gesture, minimal detail, appropriate degree of refinement, suggest and explore rather than confirm, [have] ambiguity” (Buxton 2007, p.136). This approach is particularly relevant because Buxton’s focus is on “interaction design” whereby such design can reference “…transitions, dynamics, feel [and] phrasing” (2007, p.136) as well as the static attributes of objects. In each case the move from sketching to prototypes to finished products is seen as one of opening out, experimentation, elaboration, and then closing in on a solution, reduction, see Figure 5 below.

![Figure 5: The funnels of design elaboration and reduction (Buxton 2007, p.144, after Laseau 1980)](image)

It is the case that this research project has moved through phases of elaboration and reduction, through general examinations of the area of study through to the
use of responsive environments to provide a focus but also a means of expanding
the area of study then focusing in on specific implementations through the three
practical projects to a further expansion through the use of Pask’s “cybernetic
mutualism” as principles for further research.

This process of elaboration/reduction has also been used “locally” in the practice
research. In the first practice project elaboration was used as a variety of
instances were sketched of the output for the installation including live tests of
the equipment to be used for the installation (see Appendix B). This led to a
“reduction” towards a specific implementation. In the development of the
second practice project a number of ideas were sketched out of the concept of
“captive audience”. These were all used which caused some issues in terms of
overload but, more positively, resulted in a finding to focus down on a clear and
simple instantiation for the third practice project. In the latter case, some
simple sketches were made for the project. Two forms were proposed i.e.
#TheDiamondIsle and #LoveWight with the latter being used after consultation
with Visit Isle of Wight. The design skills employed in defining the final version of
the three practice projects drew on Moggridge’s list (2006, p.659)33:

1. To synthesise a solution from all of the relevant constraints,
understanding everything that will make a difference for a result
2. To frame, or reframe, the problem and objective
3. To create and envision alternatives
4. To select from those alternatives, knowing intuitively how to choose the
best approach
5. To visualise and prototype the intended solution

Rogers, Sharpe and Preece in their Interaction Design: Beyond Human-Computer
Interaction, provide an interaction design lifecycle that operationalises
Moggridge’s list, see Figure 6.

33 Moggridge uses Schön’s concept of reframing but does not reference him.
The three practical projects have variously employed these skills to respond to constraints/requirements (the technical limitations of the first practice project and the technical failures of the second practice project), frame/reframe (cf. Schön) the objectives (the shift in the siting from the first practice project in a gallery to the second practice project in a music festival site), explore alternatives (the second practice project formats), select from those alternatives and move to a last outcome (the third practice project), as part of the practice (digital social layer) and in response to that practice (the discovery and use of Pask’s cybernetics).  

The specific approach to prototype construction and implementation was the procedure of “experience prototyping”, after Marion Buchenau and Jane Fulton Suri (2000), re-orientating prototype implementation from the laboratory into direct relationships with users. This approach acknowledges Buxton’s aspects of interaction design of “transitions, dynamics, feel and phrasing” requiring a live

\[\text{Figure 6: A simple interaction design lifecycle model (Rogers, Sharpe and Preece 2011, p.332)}\]

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34 These challenges are part of the practice of an academic practitioner. It is not that all problems can be avoided but that they can be dealt with in ways that do not undermine the impetus of the project. It is, in fact, a benefit of the academic practitioner approach that it is the combination of practice with extended theoretical assessments that makes for the research output.
activity to assess their enactment and value. Buchenau and Fulton Suri propose three forms of experience prototyping:

1. Understanding and evaluating existing user experiences and context: learning how users are presently engaged with a product or service.
2. Exploring and evaluating design ideas: testing products and services in situ with the target audience (as opposed to a lab).
3. Communicating ideas to an audience: live testing ideas to either prove or disprove their worth. The audience may be the client or the user base.

For the first and second practice projects approaches 2 and 3 have been utilised as approach 1 relates to products and services already in place. Approach 2, places the practical projects in relation to a user/visitor in conventional situations. Thus, it is possible to assess the value of the prototype approach in situ. This approach was used for both the first and second practice projects with experiences gained from them that could not have been obtained in a laboratory situation e.g. the need to embed the first practice project in the existing exhibition to evoke the ethos of the exhibition, and the technical problems of the second practice project. Approach 3, places a product/service in situ to determine whether its design is viable or not e.g. the findings from second practice project were that that format was not viable and, more positively, there was value in pursuing the “digital social layer” concept. These investigations, assessing how people respond to various initiatives in practice, were very important as they provided practical and theoretical context applied in the third practice project.

2.5 The Specific Methods applied in the Research

The PhD process began with deep research into secondary sources relating to interactive audio-visuals. This resulted in the discovery of the concept of responsive environments but with a noted “siloing” of investigations. The literature review drew out the different forms of RE both in terms of technologies and also any stated principles applied in RE. The cross-comparison
in terms of technologies and any principles applied with other significant contemporaneous approaches to interactive audio-visuals i.e. augmented reality, locative media and mixed reality initiatives. The development of six conceptual themes relating to the position and role of people in RE, the forms of engagement used, the opportunities for learning to occur and the values expressed in RE used to test in practice-based projects.

The move into the first practical project seeking to observe instances of protagonist behaviour in a standard RE setting of digital technologies applied in a gallery space, in this case the “The Wonderland of Alice” exhibition at Dimbola Lodge Museum and Gallery. Responses were captured by photographs, video, questionnaires and recorded comments. Detailed terms and conditions, model release forms and information sheets, subject to the requirements of the Southampton Solent University Ethics Panel, were supplied to inform and gather content from the respondents (See Appendix B). The data was gathered by convenience sampling i.e. by asking those who entered the gallery to contribute (Emmel 2013). Image analysis following Theo Van Leeuwen (Van Leeuwen 2014) was adopted. It will be noted that this approach accords with Schön’s reflection-in-action (1991) and a grounded theory approach (Glaser and Strauss 1965; 1999) in the sense of extracting themes from the data rather than applying an over-arching question to be confirmed by research. In the case of the first practical project whether protagonist behaviour could be reproduced (further to Lozano-Hemmer’s Body Movies) and what if any such behaviour would consist of could not be predicted. This was a matter for exploration rather than confirmation. The questionnaires and recorded comments were assessed using the “analytical memo” approach (following Jonny Saldana’s The Coding Manual for Qualitative Researchers 2014). In this way the limited amount of data could provide speculation for further research, a means of aiding reflection and the possible reframing of the hypothesis (cf. Schön 1991).
It should be noted that, due to the short run of the installation there was limited data to examine. Furthermore, the data gathered was contested with reference to the Hawthorne Effect (Gillespie 1991) as the camera was in plain sight and may have influenced any photographed/videoed activity. See Chapter Three and Appendix B for detail regarding the content gathered and findings.

Reflection on the experiences of first practical project focused on the value of the reproducibility (cf. Lozan-Hemmer’s *Body Movies*) of the phenomenon of protagonist behaviour but was, apart from the limited content gained, constrained due to the stand-alone format of the exhibition. This approach offered very limited opportunities for the protagonist behaviour in the gallery to be “productive” in the sense of being able to be carried forward other than in the minds and future actions of those small numbers offering that behaviour (Moore and Anderson 1969). Furthermore the need to address the lack of archiving of people’s content with regard to interactive-audio visuals and the stimulus of the contemporaneous activities researched encouraged a reframing of the concept of RE to include an *online* archiving of that content. This led on to the devising of the second practical project around a mix of on-line and off-line components. This was a qualitative extension of the concept of RE drawing on Floridi’s notion of “global values” in the sense of offering sustained communication beyond the immediate influence of the RE and an individual apprehension of the same.

The “Wild Things in Captivity” project at the Bestival music festival sought to offer opportunities for people to capture data under a number of headings and upload that content into a number of social media archives. It should be noted that, at this juncture, the use of social media archive was to provide a “digital layer” so that content created in the RE could be shared/commented upon. This may be compared to, for example, Peterson’s example of a CD-ROM in a gallery adding an extra digital layer to the gallery (Peterson 1991). In the present case the presentation of the content relies upon respondents to supply it/comment upon it rather than simply access it.
This method also enabled this content to be available to contributors and researchers alike and thus there was a direct representation of the content gathered in a system that both collected and portrayed that content publicly. Detailed activity sheets, terms and conditions, consent forms and information sheets, subject to the requirements of the Southampton Solent University Ethics Panel, were supplied to inform and stimulate content from the respondents (See Appendix C). The data gathered at the music festival used convenience sampling i.e. by asking those who entered the Science Tent to contribute (Emmel 2013). Image analysis following Theo Van Leeuwen (Van Leeuwen 2014) was adopted. See Chapter Three and Appendix C for detailed analysis. This qualitative analysis assessed the degree to which the respondents produced content that simply worked to the stated brief of the activity sheets and those that reinterpreted the brief. The sign up to the activities was very positive. However, the method of content archiving relied upon technical and motivational levels that were found wanting in actuality. The very asynchronousness of the format, the built in latency, before the delivery of content hindered the arrival of that content.

The limited amount of content created in the second practice project resulted in considerable reflection in terms of the methods to be used to explore the possibilities of protagonist behaviour in a third practice project. At this point Seth Giddens’ experience of microethnography is useful in that his method was to assess the content produced and also the qualities of engagement with that content (Giddens 2014 pp.55-56). The latter could be encouraged if the form of content created was reliant on the involvement of respondents as opposed to the simple capturing of content as in the second practice project. Therefore, rather than the content being other than the respondents the content could be the respondents themselves. This would shift the gathering of content to the researcher, in part i.e. the responsibility of the capture and archiving of the content could be a partnership between the parties. The #LoveWight project used hand signs to represent the Isle of Wight meaning that respondents could show their connection to the island wherever they were and the use of the
#LoveWight hashtag and the request of associated hashtags could be collected and archived without technical or motivational stumbling blocks. This method of capture and archiving resulted in over 300 people contributing to the project either independently and through capture by researcher. The latter content was captured at the Isle of Wight festival and the Bestival music festival. These sites were chosen as they offered a high concentration of people, both Islanders and tourists with the positive atmosphere of the events provide a context for the reception of the idea. This assumption was borne out by the high take-up rates at both events (see Appendix D). The data gathered at the music festivals used convenience sampling i.e. by asking people who were present at the Kashmir Tent and those who entered the Science Tent to contribute (Emmel 2013). Detailed activity sheets, terms and conditions, consent forms and information sheets, subject to the requirements of the Southampton Solent University Ethics Panel, were supplied to inform and stimulate the respondents (See Appendix D). Content was also posted directly into the Love Wight social media. In these cases respondents were directed to activity sheets, terms and conditions and information sheets. The terms and conditions were adjusted to state that anyone submitting content to the site did so under the T&Cs removing the need for signed consent.

The qualitatively different form of the visual content created through the #LoveWight project required a qualitatively different approach to the content analysis of extracted data from the photographs. In this regard van Leeuwan’s approach to iconography and specifically his analysis of iconological symbolism was apt in extracting data from the resultant photographs (van Leeuwan 2001). In this instance iconological symbolism relates to the use of icons to display some form of biographical representation. A basic format regarding the hand signs was shown to the respondents and a majority reproduced the “love” and “Wight” signs as stated. However, there was a considerable degree of reinterpretation both by those captured during the research process and those who independently submitted content (see Chapter Four for analysis of the data). The two forms of
#LoveWight produced different forms of biographical connection. For those who were pictured making the hand signs the variations included linking of arms of respondents and forming masks with the signs. For those submissions with a picture taken through the #LoveWight sign there was a means to show a connection with a particular part of the island or to connect back to the island where ever they might be. The use of hashtags to show “love” towards an aspect of the island offered further opportunities for connection. These hashtags were coded around their focus of either aspect of places, interests or concepts (following Jonny Saldana’s *The Coding Manual for Qualitative Researchers* 2014). This content when uploaded to the Love Wight Instagram received a range of imminent responses in terms of likes, shares, referrals and, in some cases, repurposing in terms of promotion of other companies e.g. Wightlink ferries (See Chapter Four for analysis of the data). The forms of content gathered at the festivals were contested with reference to the Hawthorne Effect (Gillespie 1991) as the camera was in plain sight and may have influenced any activity. Furthermore, there was at least one instance where respondents may have copied a previous set of respondents form of the hand signs as the data gathering was in a public space with free movement of people. In addition, there was an instance in the content that was supplied online whereby a respondent submitted an almost identical picture to one offered as an example at the start of the project. In the first instance the alternative methodology of lab conditions could have prevented this cross-contamination of ideas from one set of contributors to the next but as it seems that there was only one incidence of this it did not undermine the purpose of the research. In the second instance the positive gains of placing content in public archive could in fact undermine protagonist behaviour if those submitting simply copy what came before. However, there was only one instance of copying and, indeed, some of the online submissions reinterpreted the brief in sophisticated ways not only in terms of playing with the hand signs. Therefore, the use of an online archive for the content was justified for the present research.
The completion of the third practice project had originally been deemed the end of the research process. However, the discovery of the Pangaro archive led to the further discovery of Pask’s introduction to Negroponte’s *Soft Architecture* in which Pask laid out a series of thought experiments in terms of how a machine could be deemed to be intelligent. Most importantly for the present research this proposal connected people (the designer) with computers and an environment informing and being informed by the system. This shift from primary practical research to secondary theoretical analysis reveal significant similarities between the models of Pask, Floridi’s notion of Information targets and, furthermore, Neuhofer, Buhalis and Ladkin’s “Technology Enhanced Destination Experiences” (cf. Schön 1991). The outcome of this interdisciplinary analysis is important not just because it points to the currency of this mapping relating people, computers and environments but because of the form of the outputs from these systems i.e. that they are concept-producing, they place people at the centre of the system and they are co-creation systems between people, computers and environments.

Thus the mixture of theoretical and practical methods have elicited a range of outcomes that would have not have been possible without both forms being utilised.

### 2.6 Evaluation

The DECIDE framework, proposed by Yvonne Rogers, Helen Sharp and Jennifer Preece in their book, *Interaction Design: Beyond Human-Computer Interaction* (2011, p.456) was adopted in the evaluation of three practical projects. An overview of the evaluation techniques are given here. The findings and interpretations for each practical project are supplied below in Chapter Three and four.
Determine the goals

<table>
<thead>
<tr>
<th>First Practice Project</th>
<th>Second Practice Project</th>
<th>Third Practice Project</th>
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<tbody>
<tr>
<td>The main goal for the installation were to reproduce a scenario in terms of enabling opportunities for protagonist behaviour in a conventional gallery setting with “patient” level opportunities for interaction (following Moore and Anderson, 1969).</td>
<td>The main goals for the project were to extend the scope of the RE to a larger space and with a digital layer as archive supporting protagonist behaviour through crowdsourcing content with opportunities for “agent”, “reciprocator” and “referee” interactions (following Moore and Anderson, 1969).</td>
<td>The main goals for the project were to develop a digital social layer that interacts with an extended concept of RE to include the real space of the Isle of Wight supporting protagonist behaviour through the hand signs and creativity of respondents with opportunities for “agent”, “reciprocator” and “referee” interactions (following Moore and Anderson, 1969).</td>
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Explore the questions

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<th>First Practice Project</th>
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<td>The questions posed came from the themes extracted from the literature review. These were formed to meet the goal above.</td>
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Choose the evaluation methods

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<tr>
<td>Convenience sampling i.e. from those who volunteer to be respondents on entering the gallery. Questionnaires to gain qualitative insight into attitudes towards the installation. Recording of comments to cross reference with questionnaires. Photographs of visitors to be assessed using visual analysis Video of visitors to be assessed using visual analysis. For each evaluation method specific coding used for indicators relating to repurposing of content.</td>
<td>Convenience sampling i.e. from those who volunteer to be respondents on entering the Bestival science tent. Crowdsourced content to be obtained from respondents. Subject to T&amp;Cs in terms of acceptability. Photographs by visitors to be assessed using visual analysis. For the evaluation method specific coding used for indicators relating to repurposing of content.</td>
<td>Convenience sampling i.e. from those who volunteer to be respondents on entering the Bestival science tent/are approached at the Isle of Wight music festival. Crowdsourced content to be obtained from respondents. Subject to T&amp;Cs in terms of acceptability. Photographs of visitors to be assessed using visual analysis For the evaluation method specific coding used for indicators relating to repurposing of content.</td>
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Identify the practical issues

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<td>Practical issues:</td>
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<tr>
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Evaluate, analyse, interpret, and present the data

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These approaches provided a solid grounding for the development of the research project, a process that continued with the Literature Review.
Chapter Three
Towards Principles of Responsive Environments

3.1 Introduction

The chapter begins with a literature review of “Responsive Environments” in a variety of contexts. This analysis seeks to develop the concept from within the extant academic and professional uses of the term. One challenge is to draw together productive principles from, at times, disparate investigations. There is the need to determine the common themes across the different uses of the term. The lack of referencing to previous or parallel investigations by academics and others is of considerable interest. This lack of cross-referencing opens up opportunities to take the lead in, and offer a contribution to, the development of a composite analysis of the principles of responsive environments. It should be stated that this is offered as an individual interpretation of the data. Furthermore, it is important to state that due to the required brevity of this study the literature review assesses each investigation of responsive environments in terms of any principles developed. This process cannot provide a detailed examination of all aspects of the reviewed project. The reader is advised to go the primary sources for that information. Consequently, the following should be seen as biased in the sense that the focus of the review is only in terms of extracting themes that can lead to principles of use across the area of study.36

Thus this should be the starting point for a systematic, transformative analysis exploring themes in the context of the area of study. This will lead into the Chapter Three and an exploration of the philosophical stance of the research

36 The limitations of space mean that this review as had to be selective in terms of the investigations chosen, for example, there are 4100 references to “responsive environments” available on Google Scholar (Google Scholar 2105b).
project and the development of the practice projects with reference to other contemporary practice.

3.2 Literature Review: Historical Analysis of the Academic and Professional Use of the Term “Responsive Environments”

The term “responsive environments” goes back to the early-1960s and was first used by a Doctor Omar Moore, as applied to his company the Responsive Environments Corporation created in 1962. The Corporation was concerned with the development of educational devices including “The Talking Typewriter”, see Figure 7, and “Talking Page”, two interactive learning support tools.37

![Figure 7: The Talking Typewriter Lab. Child supported by Dr. Mary S. Goodwin, Associate Paediatrician. Picture Credit: http://oztypewriter.blogspot.co.uk/2011/08/on-this-day-in-typewriter-history-lxxxi.html](image)

In the case of Responsive Environments Corporation, the “responsive environment” was educationally focused on the innovative use of technology. The Talking Typewriter Lab was installed at Mary Imogene Bassett Hospital, Cooperstown, New York State and supervised by Mary S. Goodwin MD as an assistive technology for children with autism. Moore and a colleague, Alan

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Anderson, later wrote up these experiences but without reference to Dr. Goodwin’s studies or any credit given (Moore and Anderson 1969).38

In 1968, Gorden Pask wrote “Cybernetic Serendipity: Musicolour and The Colloquy of Mobiles: A Comment, A Case and a Plan” for the Cybernetic Serendipity Exhibition ICA London, Exhibition Catalogue: “it is worth considering the properties of aesthetically potent environments, that is, of environments designed to encourage or foster the type of interaction which is (by hypothesis) pleasurable” (Pask 1968 p.76). Given this description there is sufficient coincidence between Pask’s formulation and responsive environments. Furthermore, this paper has been specifically cited with regard to the concept of responsive environments (cf. Grunkranz 2010 below). He offered these criteria for such an environment:

- It must offer sufficient variety to provide the potentially controllable novelty required by a man [sic] (however, it must not swamp him [sic] with variety—if it did, the environment would merely be unintelligible).
- It must contain forms that a man [sic] can interpret or learn to interpret at various levels of abstraction.
- It must provide cues or tacitly stated instructions to guide the learning and abstractive process.
- It may, in addition, respond to a man [sic], engage him [sic] in conversation and adapt its characteristics to the prevailing mode of discourse. (Pask 1968 p.76)

Pask supplied principles to complement his work with the Musicolour Machine and his installation pieces in the Cybernetic Serendipity exhibition at the Institute for Contemporary Arts. “The Colloquy of Mobiles” was freely rotating machines

38 See Davis 2013: “Dr. Goodwin was one of the pioneers in the use of this [Talking Typewriter] technology”. This non-referencing of Mary Goodwin’s work is worrying as it is further exacerbated by Pask’s (1968), Krueger’s (1977) and Peterson’s (1991) unqualified use of “he” in their texts even in some cases where women were actively involved in the development of the project (cf. Pask 1968). More positively, the majority of substantive sources covered have either female representation or are directed by women (cf. the Literature Review and Crofts 2012a, 2012b, 2012c, 2012d, 2105).
representing male forms, designed by Pask, and female forms, designed by Yolanda Sonnabend the theatre designer, that had both lights and sensors attached, see Figure 8 below.

![Image](image_url)

Figure 8: “The Colloquy of Mobiles” at the Cybernetic Serendipity exhibition at the Institute for Contemporary Arts, London, 1968. Picture credit: http://cyberneticserendipity.net/page/2

As the machines turned they randomly lit each other’s sensors whereupon various reactions would take place. Thus visitors to the gallery could stand and watch the machines interact. The visitors could also walk amongst the machines and influence how they interacted. Pask’s focus was on the effects upon the person who is engaging with the installation. The aspects can be listed as: variety, learning, guiding and adaptive interaction. These attributes have thematic similarities to Moore and Anderson’s aspirations.

In 1969, Moore and Anderson published a paper that sought to both define responsive environments and offer principles on learning, within a constructivist theoretical framework, that could be applied in practice but without due
reference to Dr. Goodwin’s pioneering research work. Moore and Anderson proposed four principles: perspectives, autotelicity, productivity and personalisation as applied to their “Talking Typewriter” project. Each principle delineates aspects of roles that a learner can take with regard to the environment i.e.:

1. The **perspectives principle** explores the different roles that a user may take in relation to the environments i.e. Patient, Agent, Reciprocator and Referee. These roles express increasing awareness of the processes contained in the environment from a “patient” role of being in receipt of activity, through to an “agent” role taking control of action, through to a “reciprocator” role of responding to patient or agent roles in others to an overarching role of “referee” where the user is aware both of the processes at work and also the rules applied (Moore and Anderson 1969, pp.577-78). Of significance is the qualitatively different activities made available in environments but, in each case, the focus is on a different level of awareness of the systems at work. This continuum works for Moore and Anderson in that the shift through patient, agent, reciprocator and referee takes a user from being in receipt of stimulus through to a role/position of understanding the rules by which the stimulus can be made. Importantly, they do not see that a “social self” grows from one position to the next but rather a person “...should be able to take any of the four perspectives...”(Moore and Anderson 1968, p.578). Thus, a “patient” is still an active user as they have moved into a relationship with an environment: they have chosen to be in receipt of information. These roles have implications for the positions that can be held by users/visitors in the environment.

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39 It should be noted that different authors referenced through this thesis use “constructivism and constructionism” in a similar manner. Ackerman expresses the difference between the two: Piaget’s constructivism is how “ways of doing and thinking evolve over time” and how views may change, and “Papert’s constructionism, focuses more on the art of learning, or ‘learning to learn’, and on the significance of making things in learning” (Ackerman 2002, p.1). Both concepts are about growth and process.

40 “Autotelicity” meaning “having an end or purpose in itself” (Oxford Dictionaries 2015a).

41 “Social Self may be compared with Schwartz and Halegoua’s concept of the “spatial self” (2015).
2. The *autotelic principle* emphasises the self-motivation of the person encouraged within the environment: “...that the rewards in the learner’s activities must be intrinsic or inherent in the activity itself” (Moore and Anderson 1969, p. 575). There are both localised and relevant rewards for that given person, supporting self-motivation.

3. The *productive principle* privileges the quality of the activity in terms of the degree to which the experience can be taken forward and utilised into new situations, supporting promulgation and activation.

4. The *personalisation principle* foregrounds the relationship of the specific person to their encounter with, and presence in, the environment. Moore and Anderson name two conditions for this principle:

i. The responsive condition. For the authors, this is made up of the following requirements to qualify as “responsive”, :

   a. It permits the learner to explore freely, this giving them the chance to discover a problem.
   b. It informs the learner about the consequences of their actions.
   c. It is self-pacing.
   d. It permits the learner to make full use of their capacity for discovering relations of various kinds.
   e. It is so structured that the learner is likely to make a series of interconnected discoveries about the physical, cultural or social world. (Paraphrased from Moore and Anderson 1969, p.590)

ii. The reflexive condition. This is the degree to which a person can chart the processes of learning. As Moore and Anderson put it (1969, p.591) “It facilitates future learning to see our own learning career both retrospectively and prospectively”.
Although, at the time of writing there is no direct evidence to connect Pask and Moore and Anderson in terms of influence it is the case that their criteria were similar.\footnote{There is circumstantial evidence that Moore and Anderson may have known of Pask’s work. In 1960 Pask had two contributions in \textit{Teaching Machines and Programmed Learning} (Lumsdaine and Glaser, eds., 1960). “Adaptive Teaching with Adaptive Machines” (Pask 1960a) and, particularly, “Electronic Keyboard Teaching Machines” (Pask 1960b) are papers that show that Pask was directly interested in the same area as Moore and Anderson. The editorial team of Alan Lumsdaine and Robert Glaser were based at Pittsburgh University in 1960, and Glaser, at least, was still there at the same time as Moore and Anderson in the late 1960s (Glaser Obituary 2012).}

Also in 1969, at University of Wisconsin-Madison, Myron Krueger began working with other artists to create video-based installations including “VideoPlace”, see Figure 9 below.

![Figure 9: “VideoPlace” in action; Picture credit: http://thedigitalage.pbworks.com/f/1259016777/pose_videoplace.jpg](http://thedigitalage.pbworks.com/f/1259016777/pose_videoplace.jpg)

This early work was summarised by Krueger in a paper entitled, “Responsive Environments” given at the \textit{National Computer Conference} in 1977. He states (1977, p.423):

\[\text{Man-machine interaction is usually limited to a seated man [sic] poking at a machine with his [sic] fingers or perhaps waving a wand over a data}\]
tablet. Seven years ago, I was dissatisfied with such a restricted dialogue and embarked on research exploring more interesting ways for men and machines to relate. The result was the concept of a responsive environment in which a computer perceives the actions of those who enter and responds intelligently through complex visual and auditory displays.

Krueger also posited a “[R]esponsive environment that perceives human behavior and responds with intelligent auditory and visual feedback” (Krueger 1977, p. 423). Krueger does not reference Moore and Anderson or Pask regarding the use of responsive environments, indeed, there are no references included in his 1977 review. Krueger does offer a list of technical examples based on his own work e.g.

1. An entity which engages the participant in a dialogue.

2. A personal amplifier. One individual uses the environment to enhance his [sic] ability to interact with those within it.

3. An environment which has sub-environments with different response relationships.

4. An amplifier of physical position in a real or artificially generated space. Movements around the environment would result in much larger apparent movements in the visually represented space.

5. An instrument which the participants play by moving about the space.

6. A means of turning the participant’s body into an instrument. His [sic] physical posture would be determined from a digitised video image and the orientation of the limbs would be used to control lights and sounds.

7. A game between the computer and the participant. This variation is really a far more involving extension of the pinball machine, already the most commercially successful interactive environment.

8. An experimental parable where the theme is illustrated by the things that happen to the protagonist—the participant.

(Krueger 1977, pp.430-31, abridged.)

However, these are instances of experiment and instrumental research rather principles. Krueger does offer a list of sites where these technologies could be of
value i.e. in an educational or psychological or psychotherapy application. The majority of these proposals were speculative. However, Krueger did run a short series of workshops with school children to conduct science experiments, documented in a later book *Artificial Reality* (1983). Yet, the requirements of the experiments are not stated in his write up. Furthermore, Krueger includes the following statement: “Some of the children draw erroneous conclusions” (1983, p.178). Without the context of the experiment it is not possible to determine the roles the children were undertaking or why they were “making mistakes”.

Despite these caveats it is important to state that Krueger offers the first examples of the application of the concept of responsive environments in an interactive audiovisual context. The lack of underlying principles with regard to the concept of responsive environments may be explained by Krueger’s focus on a different aspect. Not the specific implementations but: “It is the composition of these relationships between action and response that is important. The beauty of the visual and aural response is secondary. Response is the medium!” (Krueger 1977, p.430). Krueger staked a claim for the definition of responsive environments not related to principles of implementation but in terms of the creation of a new medium in itself. In *Artificial Reality*, Krueger raises contradictory issues that developed during his GLOWFLOW project in 1969. Under a heading of “Interactive Dilemma” he wrote:

> The artists’ attitude toward interaction between the environment and the participants was ambivalent. Responsive relationships were seen as conceptually interesting but the artists did not feel that it was important for the audience to be aware of them. The idea of direct response to movement and voices was discarded. (Krueger 1983, p.16)

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43 Krueger’s use of video-based interaction systems was clearly influential on David Rokeby’s later video work, including “A Very Nervous System” (Rokeby 1990), for example.
As with musicians playing with Pask’s Musicolour Machine, it was the variety enabled by the system and its lack of predictability that was so beguiling. However, Krueger saw this similar experience as unsatisfactory and drew some conclusions for future projects including:

Participants should be aware of how the environment is responding to them.  
The only aesthetic concern should be the quality of the interaction. The interactive experience may be judged by very general aesthetic criteria: the ability to interest, involve, and move people; to alter perception; and offer a unique kind of beauty. (Krueger 1983, p.17)  

This conclusion heralded Krueger’s shift into predictable interactions that may be of use in educational or other contexts, hence, the seeking of no “erroneous conclusions”. This didacticism compares markedly with Moore and Anderson’s experiential approach to learning through exploring. Krueger’s focus on interaction is all encompassing but without the development of general principles it is local to his installations.

A year after Krueger began his experiments at University of Wisconsin-Madison, Billy Klüver, Fujiko Nakaya, Robert Breer, Robert Rauschenberg and many others (cf. Breitwieser 2015, p. 156) created *The Pavilion* for the Pepsi Pavilion at the *Expo ’70* in Osaka, Japan, see Figures 10 and 11 below.

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44 This statement can be compared directly with the analysis of Kwastek in Chapter One. The process of interaction itself is put centre stage.
Klüver and Robert Rauschenberg’s Experiments in Art and Technology (E.A.T.) group had been creating amalgams of art and technology during the late 1960s
and early 1970s. The Pavilion project is acknowledged as the most significant E.A.T. project. It involved the creation of a dome with an interior mirrored surface, hand-held devices, responsive floating blocks, surround sound system, a sun tracking sculpture (unfortunately not installed due to technical difficulties), and a “Fog Sculpture” by Fujiko Nakaya. In 1972, Klüver, together with Barbara Rose and Julie Martin, published a book detailing the construction and the experiences of The Pavilion. In the book Klüver explained the concerns of the designers of the Pavilion: “…the quality of the experience of the visitor should involve choice, responsibility, freedom and participation” (Klüver, Rose & Martin 1972, p.223). Klüver also provides further detail on the general construction of the Pavilion: “The Pavilion was a living responsive environment. The Fog surrounding the Pavilion responded to the metrological conditions; the Suntrak sculpture was to follow the path of the sun; the moving floats reacted to physical contact” (Klüver, Rose & Martin 1972, p. 223). But this was not just an installation. A programme of events took place within the dome during the Expo. The Pavilion was both an exhibit but also a location for performance and activities, at least until Pepsi took back the running of the Pavilion because of creative differences with the E.A.T. team (Breitwieser 2015, pp.156-61). At the time of production it was the most advanced responsive environment created. This was an expression both of the zeitgeist but also of a swan song in terms of the aspiration of a responsive environment at that time. There then followed a tailing off in the use of the term that lasted into the 1980s.

In 1985, Ian Bentley, Alan Alcock, Paul Murrain, Sue McGlynn and Graham Smith published Responsive environments: a manual for designers (Bentley et al

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47 After around six weeks of operation Pepsi replaced E.A.T.’s innovative programming with “It’s a Small World” soundtrack from Disney. This was a statement about the need for a commercial orientation for the Pavilion.
1985). This book offered practical support for architects working in urban design and featured detailed descriptions relating to the development of site near the centre of Reading, England.\textsuperscript{48} It did not directly reference any previous uses of the term. It had a specific rationale based on the needs of those in that urban environment:

We start from the same ideal as that which has inspired most socially-conscious designers of the last hundred years: the idea that the built environment should provide its users with an essentially democratic setting, enriching their opportunities by maximising the degree of choice available to them. (Bentley et al 1985, p. 9)

Bentley et al developed criteria of: “permeability, variety, robustness, visual appropriateness, richness, personalisation and legibility” (1985 p. 9) as applied to the concept of responsive environments.

They explained their criteria in terms of the relationships between design and choice:

\textsuperscript{48} It should be noted that at time of publication accessible computer aided design was in its infancy e.g. the company AutoCAD released its first software in late 1982 (AutoCAD 2015). Bentley et al did not use computers for architectural designs but they did use an Apple 2 Plus running Visicalc to enable “the economic feasibility of the scheme to be continually monitored as the design developed” (Bentley et al 1985 p.116).
The design of a place affects the choices people can make, at many levels:  
- it affects where people can go, and where they cannot: ...permeability.  
- it affects the range of uses available to people: ...variety.  
- it affects how easily people can understand what opportunities it offers: ...legibility.  
- it affects the degree to which people can use a given place for different purposes:...robustness.  
- it affects whether the detailed appearance of the place makes people aware of the choices available: visual appropriateness.  
- it affects people’s choice of sensory experience:...richness.  
- It affects the extent to which people can put their own stamp on a place:...personalisation. (Bentley et al 1985, p. 9. Original emphasis)

Although these criteria were established to address aspects of the interactive relationship between users and urban environments their aspirations are similar at the level of principle with those laid out by Pask and Moore and Anderson above. For example, Pask’s notion of providing “cues or tacitly stated instructions to guide” is similar to Bentley et al’s concept of “legibility” and the use of “personalisation” seems to be a case of synchronicity, as Bentley et al do not reference Moore and Anderson. Importantly they provide criteria that address the spatial aspect in terms of setting and apprehension, interaction and presence. Of equal importance is Bentley et al’s emphasis on a social and democratic ethic i.e. the criterion of purpose is also very important in any responsive environment.

In 1991, Andrew Peterson in his paper “Evaluation of Hypermedia and Interactivity in the Museum: A Constructivist Approach to Instructional Design” (Peterson 1991) suggested that Moore and Anderson’s criteria of Perspectives, Autotelicity, Productivity and Personalisation should be used in a museum context:

The principles of the responsive environment program--Perspectives, Productivity, Personalization, and Autotelicity--are ideal for hypermedia and interactivity. Based on a Constructivist model, they guide the
development of museum exhibits which lead to engagement and enjoyment. (Peterson 1991, p. 79)

Peterson’s position paper applies Moore and Anderson’s four criteria onto possible museum artifact exhibits using interactivity to elucidate responses. This is interesting as Moore and Anderson’s principles of learning could be redeployed in a museum context. Indeed, this is one of the few examples of such cross-domain referencing and deployment. Peterson’s application of the “perspectives” criteria is as follows:

(1) If a learner is in full control of the operation of the exhibit then he [sic] has the agent perspective. This is that of the scientist, a puzzle-solver.

(2) If there is no control then he [sic] is a patient. Much like the gambler playing a game of chance, significant elements are beyond regulation of the operator.

(3) If a visitor to the exhibit can interact with another person in the course of working the presentation, then he [sic] is a reciprocator. The challenge of this social situation is to solve problems as one takes the other participant into account with every move in a strategic contest.

(4) If the student is to make normative judgments, aesthetic or ethical, then he [sic] has the perspective of the referee. There is a values-dimension to any responsive environment.

(Peterson 1991, p. 77, abridged.)

This application begs a number of questions e.g. what is meant by full or no control? A participant may react with another without accounting for “every move in a strategic contest”. Furthermore, Moore and Anderson bestow the role of the referee on a participant who knows the rules of the system. These rules are not only aesthetic and ethical but practical too, although the reference to values in such a system is interesting for its rarity.
Peterson also looked at how “productivity” could be stimulated in a museum setting:

The insights and processes that are gained in a museum exhibit should help to understand other parts of that exhibit, other parts of the museum or elsewhere in the world. Learning a concept or fact should have relevance to later understanding. [N]ote that this is far from a passive view of the museum visitor--there is an expectation of enrichment.

(Peterson 1991, p. 77, abridged)

Peterson gives no examples of how this can be put into practice. However, the educative value of museums is a point well made both locally in terms of the building of knowledge during a visit but also the value of new knowledge out “in the world”.

By comparison, Peterson offers an example with regard to “personalisation” i.e. a CD-ROM exploration of the Solar System named as a responsive environment. This is a possible first use of the term in reference to a computer-based display. Peterson argues that a visitor using the CD-ROM will operate in a self-paced manner and has opportunities for reflection on the information gained, to see themselves as astronauts in space, for example. However, Moore and Anderson’s take was that “reflection”: “… facilitates future learning to see our own learning career...” (1969, p.591). This is a much more sophisticated reaction than a visitor simply reflecting on the content in front of them. This is about seeing oneself in the context of learning.

Latterly, Peterson looks at the “autotelic principle”. As mentioned above, Moore and Anderson define this as “[T]he rewards in the learner’s activities must be intrinsic or inherent in the activity itself” (Moore and Anderson 1969, p.575). This relates to the quality of the experience offered in situ. However, Peterson states that: “[The autotelic] principle has to do with the choice of a person to
participate in our exhibit”. (1991, p. 78). This does not square with Moore and Anderson’s approach which is about the perception of the visitor engaged in an activity appreciating the value of the experience rather than the decision to engage with that content. Put simply there could be many reasons to choose to do something but the actuality of the experience may be perceptually something else.

Peterson has reinterpreted a number of Moore and Anderson’s approaches without there being a clearly stated justification. More positively, he raises a number of issues that are pertinent to the construction of responsive environments in museum contexts including the need to consider the “values-dimension” in any such structure, a perspective, he argues, for which Moore and Anderson could offer no principle (1991, p. 77). However, Peterson’s call to reference his interpretation of Moore and Anderson’s criteria was not taken up by others nor did Peterson further develop this approach.

In 2002, Aljosa Dekleva, Manuela Gatto, Tina Gregoric, Robert Sedlak and Vasilis Stroumpakos developed a postgraduate project at the Architectural Association School of Architecture, London that resulted in the publication Negotiate My Boundary!: Mass Customisation and Responsive Environments (Dekleva et al 2002). This included an extensive definition of responsive environments:

A responsive environment is able to react to stimuli serving as an input for its performance, appearance or arrangement, which in turn are based upon the activities and choices of its individual users. In order to be considered truly ‘responsive’, such systems must be able to process incoming information and adapt themselves to a condition different from an initial state (including an organization, arrangement or installation of built elements). Today [2002] systems such as these can be guided by software systems that control new configurations based on information collected from the patterns of human use and behaviour within these installations; accordingly, such environments consist of architecture elements that do more than just ‘move’. Responsive environments are twofold entities: while they are material assemblages able to be seen, touched, adjusted (they have a physical presence), they are also invisible,
in that they consist of networks comprising software controls guided by scriptable performance criteria that ultimately determine how these arrangements respond to specific needs and predefined events. (Dekleva et al 2002, p. 78)

As stated Dekleva et al provide a general working definition of responsive environments with specific emphasis on the computer-aided environment. However, their implementation of these principles is very constrained. They envisaged (because their work was an extended thought experiment) responsive, computer controlled, surfaces in terms of CAD (computer-aided design) planes that could be programmed to respond differently to outside stimulus e.g. opening or closing shutters. In addition, they proposed wireframes that could be indented to create different topologies. Both of these systems were to be controlled by a RECC, a “Responsive Environment Control Centre”. The RECC enables the monitoring and control of the relationships between users and their environment (Dekleva et al 2002, p. 159). This is a very specific implementation of a responsive environment that does not include any examination of the principles at work. It is also the case that Dekleva et al offer no references to previous research or initiatives into responsive environments apart from the “Responsive Environments Group” at M.I.T. This is not surprising given that they both are concerned with technical sensors (Dekleva et al 2002, p. 192). Furthermore, although they do not reference Pask, this implementation relates to a functional form of cybernetics. Yet, their noting of a two-fold nature of responsive environments as being both physical and invisible, as in networked, is worthy of further reflection.

In 2000, staff at the University of Portsmouth including Dr. Chris Creed, Simone Gumtau, postgraduate student, and Dr. Paul Newland, formed a Centre for Responsive Environments. The focus of the centre’s work was a room construction designed to provide interactive stimulus for children with severe autism, see Figure 14 below.

The project was funded by the European Union. The MEDIATE (Multisensory Environment Design for an Interface between Autistic and Typical Expressiveness) initiative was not configured as necessarily therapeutic but rather as an assistive technology to offer outlets of musical expression for the children. The constructed space was reactive and interactive (Newland and Creed 2003). It used similar algorithms to Pask in his Musicolour Machine i.e. the system could analyse the activity of the child in the space and if they became too repetitive in their movements the system would offer new and diverting stimuli (Newland and Creed 2003). However, there is no mention of Pask in the documentation of the project, nor, in fact, to any previous RE investigations or principles laid down.

In 2003, both Klüver’s paper on The Pavilion, from the publication with Barbara Rose and Julie Martin, and Krueger’s “Responsive Environments” paper were reprinted in Wardrip-Fruin and Montfort’s The New Media Reader (Wardrip-Fruin and Montfort 2003). Of The Pavilion, Wardrip-Fruin and Montfort wrote: “... E.A.T.’s Pavilion for Expo 70 showed the potential in creating a full environment” and “While the cutting-edge nature of the Pavilion’s planned live performances continued to baffle those in power...E.A.T. deserves applause for never retreating to well-trodden artistic ground” (Wardrip-Fruin and Montfort 2003, p. 212). They
did not allude to Klüver’s use of the term “responsive environment”. This can be compared with their summary of Krueger’s work: “…“responsive environments” - a body of work heralded as art by some, as technology by others, and as neither by powerful groups in each field. Yet Krueger’s work...was enormously influential” (Wardrip-Fruin and Montfort 2003, p. 83). However, they do not give examples of that influence. There was, perhaps, an opportunity for Wardrip-Fruin and Montfort to “rebrand” the responsive environment concept at this time but they did not take it.

Rod McCall, Shaleph O’Neill, Fiona Carroll, David Benyon, Michael Smyth, published a paper entitled “Responsive Environments, place and presence” in the *PsychNology Journal* in 2005. This paper referred back to Bentley et al’s attributes of responsive environments in a preliminary discussion about the relationships between real and virtual worlds. The conclusion drawn seems to be of the limited applicability of Bentley et al’s attributes to McCall et al’s research:

> ...in the virtual environments discussed in this paper technical restrictions prevent people from moving. Although the environments suggest that paths are available using them is not possible. Moreover, virtual environments often restrict several aspects of the experience such as richness, variety, robustness and personalisation; therefore reducing the potential cues available that may help people in developing their sense of place. (McCall et al, 2005, p. 38)

It is important to note that McCall et al have constructed virtual environments on screen that a user/visitor can survey but their relative position does not change with regard to the objects in the space. This was also the case with Peterson’s example above of the Solar System CD-ROM. These may be compared with environments in Second Life where there is the possibility of “permeability” as suggested by Bentley et al (Second Life 2015). Furthermore, Second Life offers a wide range of personalisation capabilities. Therefore, any criticisms would be better aimed at their own instantiation and that Second Life could have been
used as the testing ground for Bentley et al’s categories as it was available to McCall et al in 2005. The positioning of digital technologies in relation to the environment requires further reflection.

A year later in 2008, Karen Kortbek and Kaj Grønbæk, published “Interactive spatial multimedia for communication of art in the physical museum space” in the Proceedings of the 16th ACM international conference on Multimedia (Kortbek and Grønbæk 2008). The paper includes the following statement: “We use the notion of “interactive spatial multimedia” to denote interactive multimedia integrated in the physical architectural environment, i.e. modern instantiations of Krueger’s classical Responsive Environments. We propose three specific techniques suitable for art museums” (Kortbek and Grønbæk 2008 p. 229). Unfortunately, there is no further discussion of Krueger’s work. Furthermore, the three specific techniques do not seem comprehensive in their coverage: “Spatially Bounded Audio, Floor-Based Multimedia and Multimedia Interior” (Kortbek and Grønbæk 2008 pp.230-31). However, Kortbek and Grønbæk have a specific mode in mind for engagement in museums: “[B]y using the body as an interaction device, the communication of art makes better use of the human’s sensory and motor systems, and enables the user to experience the art through physically and socially engaging activities” (Kortbek and Grønbæk 2008 p. 230). This focus is interesting as it is not about a museum visitor at a terminal as the stimulus for that interaction (à la Peterson 1991). Furthermore, this focus, with some reference to Krueger’s work, is on an intimate form of interaction i.e. through the presence of the visitor/s in the gallery. This is an interesting aspect requiring further reflection.

In 2010, Daniel Grunkranz published “Towards a phenomenology of responsive architecture: intelligent technologies and their influence on the experience of space” (Grunkranz 2010). This was an attempt to apply a phenomenological analysis to responsive architectures i.e. to move beyond a technical/technological approach to examine the meaning for those in such spaces. As
mentioned above, Grunkranz also references Pask i.e. “Responsive environments as the famous Colloquy of Mobiles reflected Pask’s ambitions in interaction design, where the impact of actions on the environment led to further modification of actions through interaction loops” (Grunkranz 2010).

Grunkranz draws on Don Ihde’s terms of analysis: embodiment-relations, hermeneutic-relations, alterity-relations, and background-relations between humans and technology (Ihde 1990). These relations offer different possibilities that cross-relate to some of the approaches within this thesis i.e.

Embodiment-relations: The seamless connection between the technology and the human body (cf. Kortbek and Grønbæk).

Hermeneutic-relations: The means of reading a technology through forms of texts. This acknowledges the role of descriptors/interfaces in the conveyance of meaning (cf. Kwastek).

Background-relations: The use of ambient/non-obvious technologies (see Lino, Salem and Rauterberg’s work below).

Alterity-relations: The possibilities that can be gained through seeing technology as an Other that can be communicated with (this has connections with Pask’s aspiration above relating “aesthetically potent environments” and “mutualism”).

The first three of Ihde’s relations can be related to specific technical aspects as witnessed by the references supplied above. Yet how does intentionality in the phenomenological sense fit within these relations? There may be a variability of outcomes and the possibility of misreading or repurposing by the person in that environment. This is equally about how the environment presents itself i.e. offering opportunities for variability of outcome. In fact, Ihde’s “relations” are that: “positions” for users/visitors in relation to an RE but not principles by which such systems are to be built. The technology is presented as a given. As critiqued below, this is particularly the case when analyzing
“ambient” (background-relations) responsive environments: a functional form of interaction, to use Pask’s term, whereby the user/visitor is in a passive role.

In comparison, the concept of “alterity-relations” digs deeper into the perception by people of their relationships with technology and asks more to be known of the construction of that technology. In this regard, Grunkranz states:

Through the viewpoint of the technological other, the responsive environment should motivate individuals to participate and explore by providing learning experiences. Pask was following the idea of a technological competitor to allow people to develop a critical consciousness for their everyday life. (Grunkranz 2010)

This interpretation relates to Pask’s stated aim for “mutualism” but with an extra dimension of “values” in the sense of being mentally stimulated through the conversation with that environment. This is Grunkranz’ extrapolation and it may be that there is an issue of translation as the phrase “a technological competitor to allow people to develop” seems contradictory not least because that is not an example of “mutualism” through conversation but consent bestowed. As mentioned above, there is a distinct lack of emphasis on values in the writings on RE. Therefore, Grunkranz’ contribution is important because it asks us to consider a values position *per se* with regard to the purpose of responsive environments. However, that is his final statement on the matter. There is no explanation as to how a “critical consciousness” may be developed. In short, Grunkranz describes instances of phenomena as relations between technology and people. He offers no principles as to how they could be developed in practice.

Also in 2010, Jorge Lino, Benjamin Salem and Matthias Rauterberg, published their paper “Responsive environments: user experiences for ambient intelligence”. In the paper they promote the concept of “Natural Interaction”:

“Natural interaction relates to the user interface paradigm; it is based on natural
modalities such as speech, gestures and tactile movements” (Lino, Salem and Rauterberg 2010, p. 348). They offer two further aspects, referring to the work of Emile Aarts, from an ambient intelligence perspective i.e. “context awareness” and “ubiquitous computer” (Aarts 2007). Lino, Salem and Rauterberg supply criteria that extend Aarts’ criteria to develop “characteristics of a responsive environment system” (2010, p. 361), see Table 1.
### Characteristics of a Responsive Environment System

<table>
<thead>
<tr>
<th>Criteria</th>
<th>User-Centred Approach (focus on user experience)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>The building of the infrastructure is mostly concerned with the delivery of experience and perception (e.g. Ada Experience [18], TMN Bluestore [59]).</td>
</tr>
<tr>
<td>Interaction</td>
<td>The interaction interfaces are at the periphery of the user’s attention, resulting in interaction models that are non-invasive and non-obtrusive, thus not interrupting the user. The design of the environment is focused on enhancing the user experience (e.g. Car windshield by General Motors [23], World Cup Adidas Ball [63]).</td>
</tr>
<tr>
<td>Context awareness</td>
<td>Environments are designed to enable an understanding of current contexts. As a result, systems achieve interpretation, rather than just descriptions (e.g. Prada Shop [46], Ada Experience [18]).</td>
</tr>
<tr>
<td>Adaptation</td>
<td>The adaptation is taken upon a proactive level, based on history, user profiles and predictions of user needs, requirements, desires, explicit and implicit inputs and the surrounding context (e.g. TMN Bluestore [59], Prada Shop [46]).</td>
</tr>
<tr>
<td>User Experience</td>
<td>At this level, the attention is on the aesthetic effect of the experience: the impact that the appearance and perception of a designed artefact have on the user’s emotional and mental world. The technology is present to enhance an existing real environment, with the goal of achieving positive experiences, given that the function is integrated in a context, instead of being isolated (e.g. Songdo’s Ubiquitous City [45], Prada Shop [46], TMN Bluestore [59]).</td>
</tr>
</tbody>
</table>

Table 1: Characteristics of a responsive environment system (Lino, Salem and Rauterberg 2010, p. 361)
The above table is interesting not only in that it attempts to list attributes of responsive environments but also because it offers examples under each of the headings indicating different levels/emphases relative to a user-centred approach. However, the headings: Infrastructure, Interaction, Context Awareness, Adaptation and User Experience are not mutually exclusive. Indeed, any of the references given in the table can be examined using any of the criteria. These criteria are interesting, and Lino, Salem and Rauterberg go some way to generalize their use across public locations, museums and galleries. Furthermore, they claim that they are working in the “...emerging field of responsive environments as an ambient intelligence system with a focus on user experience” (2010, p.347). However, they refer only to Myron Krueger’s work and albeit tangentially (2010, p. 360):

... the concept of Aml (Ambient Intelligence) ... has been developed on scientific contexts, and the way Krueger explored the theme in an artistic perspective, we have approached and redefined responsive environments as physical spaces that are enhanced with ambient intelligence, e.g. media and technology to provide a user experience that is interactive, rich, unique and changing.

It should be noted that Krueger was in fact interested in responsive environments beyond “an artistic perspective”. Indeed, there was a rejection of the “perspective of the artists” as stated in his book of 1983. Krueger is referenced incorrectly and then his ideas are transcended with the notion of responsive environments as imbued only with ambient intelligence. He is not referenced again in the paper.

It is also of concern that, given their interest in public spaces, Lino, Salem and Rauterberg do not reference Bentley et al’s investigations. Indeed, they claim: “We redefine responsive environments as physical spaces, such as city squares, public halls, etc., that are enhanced with the use of technology and media” (2010, p. 347). This claim points to the possibility of integrating principles from existing analysis in the built environment e.g. Bentley et al and
from work conducted within a museum, gallery or performance context into interactive audio-visuals. Lino, Salem and Rauterberg’s approach has been to overlay their analysis onto an existing built environment ethic. In comparison, Bentley et al show that that ethic is in itself adaptable/responsive. Furthermore, defining responsive environments in terms of ambient intelligence precludes more overt and communicative technology. They have focused on the ambient form as one that may be found present across different physical spaces but in so doing they have limited the scope of responsive environments. Interventions from people with such environments are often a key part of why they are responsive.

3.3 Responsive Environments Themes and Research Questions

An analysis of the principles explored in the various perspectives on responsive environments points to the following recurring themes. These themes encourage the related research questions as supplied.


Research Question: Can an environment that is configured to offer a limited role (“patient” level) still stimulate users/visitors both inside and outside of its remit?

This can lead onto examination of more advanced roles in the second and third practice projects.

2. The position of the user/visitor in relation to the responsive environment. (Moore and Anderson 1969; Pask 1968; Krueger 1977; Klüver, Rose & Martin 1972;
Bentley et al 1985; Dekleva et al 2002; McCall et al 2005; Kortbek and Grønbæk 2008; Grunkranz 2010; Lino, Salem and Rauterberg 2010)

Research Question: Can an environment that is configured to offer a limited position (patient level) still stimulate users/visitors both inside and outside of its remit?

This can lead onto examination of more advanced positions in the second and third practice projects.

3. The use of technologies to construct initial conditions that can be further affected by user/visitor. (Pask 1968; Moore and Anderson 1969; Klüver, Rose & Martin 1972; Bentley et al 1985; Peterson 1991; Dekleva et al 2002; Newland and Creed 2003; Kortbek and Grønbæk 2008)

Research Question: Can repurposing opportunities arise even when the content is closely locked, i.e. allowing limited input from the user/visitor and, if so, what forms does that repurposing take? 50

This can lead onto examination of more open content in the second and third practice projects.

4. The possibilities of the responsive environment enlightening the user/visitor through learning opportunities. (Moore and Anderson 1969; Pask 1968, Krueger 1977; Bentley et al 1985; Peterson 1991; Lino, Salem and Rauterberg 2010)

Research Question: What forms of learning experience are possible even when the content of a responsive environment is locked down?

50 As in more closely locked than Body Movies at the time of writing to be determined.
This can lead onto examination of learning experiences from more open content in the second and third practice projects.


Research Question: How can a responsive environment use sound, visuals and presence to enable forms of enrichment?

This can lead onto examination of more advanced forms of enrichment in the second and third practice projects.

6. The reference to the values promulgated through the responsive environment that may express themselves through the other five themes. (Moore and Anderson 1969; Klüver, Rose & Martin 1972; Bentley et al 1985; Peterson 1991; Newland and Creed 2003)

Research Question: What value and/or values are enabled in and through the responsive environment?

This can lead onto examination of other values in the second and third practice projects.

3.4 Contemporaneous Practice beyond Responsive Environments

The Literature Review has thus far concentrated on initiatives directly named as RE or sited in the same way (cf. Pask 1969). This part of the review is important as it directly focuses on both the constituents of RE and attempts made to define
specifically RE. However it is the case that important contemporaneous practice projects and analysis have taken place through the same period of time. Initiatives in Augmented Reality, Mixed Reality and Locative Media can enrich the theoretical and practical developments of the present research. Indeed they may provide means to reevaluate and restage what an RE can be. In this regard each sub-section here points to practical proposals for further investigation in the present research. Chapter Four will seek to draw on these proposals after due consideration of the implications on practice.

3.4.1 Augmented Reality

The concept of Augmented Reality (AR) has developed through the use of computers from the 1990s. The technology requires a form of computer vision i.e. a computer/smart phone imports a live video feed from a location and overlays with the results displayed on screen. Niantic Labs have recently launched “Pokemon Go” to utilise this form in video game with global reach.


Figure 14: Pokemon Go screenshot. Picture credit: https://play.google.com/store/apps/details?id=com.nianticlabs.pokemongo

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There were analogue examples pre-digital. For example, mattes or “painting on glass” has been used in films to provide a virtual overlay to a live scene (Cook 2012) and the Pepper’s ghost theatrical technique that overlays people and objects in a space through semi-transparent screens (Weynants 2015).
An alternative version of AR is to overlay live generated computer graphics or video in realtime in a real space, for example, Troika Ranch’s “Future of Memory” 2003 performance, in which video captured on stage is then projected back on to the stage in another orientation (Troika Ranch 2003). This form of AR has been a key component of the research conducted by KikiT VisuoSonic Research Group i.e. the interrelationship between performers musicians, dances and others, in a variety of spaces overlaid with computer generated interactive graphics (cf. KiKiT Images, 2016). In this regard KVS joined a considerable history of performance-based AR.

Some of the REs investigated in the Literature Review adopt aspects of AR. Myron Krueger’s “VideoPlace” represents people’s movements in graphical form in the same space but not overlaid. The Pavilion’s mirrored dome represents the

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Clay et al, in their paper “Integrating Augmented Reality to Enhance Expression, Interaction & Collaboration in Live Performances: a Ballet Dance Case Study” 2014, have argued both that the term AR can be used in this manner and that Troika Ranch are exponents of that form.
occupants in an inverted form causing disorientation but again without the overlaying of content. The most simple form of projection is a mirror. However, it is possible to propose an RE that overtly incorporates/overlays AR components in an environment as part of the requirement for response. There is scope for these extensions to be explored within the remit of the present research (cf. Dixon, 2007 for other examples).

AR has specific spaces of operation i.e. on screen or in performances spaces. However it has been conceptually incorporated into the larger field of “mixed reality”. This field contains initiatives of relevance to RE and is examined in the following sub-section.

3.4.2 Mixed Reality

The possibilities of extending the concept of RE immediately become apparent when the definition of Mixed Reality (MR) is investigated. Milgram and Kishino’s “Mixed Reality Continuum” provides a summary of their taxonomy regarding MR ,Table 2 .

Augmented reality

<table>
<thead>
<tr>
<th>Reality</th>
<th>Augmented Virtuality</th>
<th>Virtual Reality</th>
</tr>
</thead>
</table>

Table 2: Milgram and Kishino’s Mixed Reality Continuum - from a drawing by Steve Benford (Benford and Giannachi 2011, p.3)

Benford and Giannachi in Performing Mixed Realities argue that MR “... encompasses both “real” and “virtual” elements and so allows for the possibility
of generating and analysing environments in which physical and digital objects cohabit and interact in realtime” (Benford and Giannachi 2011, p.3). Furthermore they point to projects that go beyond single points on the above continuum and

simultaneously occupy multiple points along this continuum by combining many real, virtual, augmented reality and augmented virtuality environments into complex hybrid and distributed performance stages. (Benford and Giannachi 2011, p.3)  

It would seem from these definitions that there is a direct relationship between RE and MR in that they both inter-connect computers and environments. There are certainly many crossover points despite the lack of referencing to MR in the RE literature. To be clear this is not a matter of the same activity in a different domain i.e. because the Bendford and Giannaci’s focus is performance this does not pertain to RE. In fact, a number of the designated RE have included performance elements e.g. The Pavilion (Klüver, Rose, Martin 1972). A key difference is in terms of the sitings of the MR, as a distributed form of practice. Furthermore, the notion of generating an environment is highly significant. Such an MR environment was created in the project *Can You See Me Now?* by Matt Adams, Ju Row Farr and Nick Tandavanitj of the artist group Blast Theory in collaboration with the Mixed Reality Lab at Nottingham University in 2001. This formative project inter-connected online players in a virtual city to be chased by real performers from Blast Theory negotiating a real city scape mapped to the virtual one. The project was experienced in, for example, Sheffield; Rotterdam; Oldenburg; Köln; Brighton; Barcelona; Tokyo; Banff; Chicago; Madrid and London with each city modelled in 3D and with each real space negotiated by the Blast Theory performers (Blast Theory 2001). Handheld computers and GPS receivers enabled a connection to be made between the real space and the online players.

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53 “Hybrid reality” is used as an alternative to MR cf. de Souza e Silva and Sutko, 2009 pp. 1-2. Indeed, they argue that MR is limited as it refers back to frameworks before the digital. However, the term MR will be used here because of the considerable significance of the Mixed Reality Lab at Nottingham University.
The concept revolved around online players' relationships with people they had not seen for a while with their captors taking a picture of the place of seizure and naming it after the absent acquaintance. Thus the game of chase was given poignancy through a missing social connection.

These components of a distributed environment, an *online* presence and a social commentary (for example, through alignment of people with real spaces, cf. “*Can You See Me Now?*”) could be applied to an RE. In each case there would be considerable extension to the concept of RE beyond an enclosed offline yet computer supported space with little social commentary or even the expression of values as part of the content. Further to the exploration of the conventions of an RE in the literature review there is scope to challenge and develop those conventions around these three additional components. These extensions could be explored within the remit of the present research.

In addition to these spatially supported/supporting components Bedford and Giannachi also offer, further to a case study on another Blast Theory project *Day of the Figurines* (Blast Theory 2006), an analysis of the different forms of time that may relate to MR practices in the construction of an interactive narrative (Bedford and Giannachi 2011, p.96) i.e.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived time</td>
<td>Timing of the interactions as perceived by the participant</td>
</tr>
<tr>
<td>(participant)</td>
<td></td>
</tr>
<tr>
<td>Interaction time</td>
<td>The times at which a participant choose or is able to interact</td>
</tr>
<tr>
<td>(participant)</td>
<td></td>
</tr>
<tr>
<td>Schedule time</td>
<td>The times at which the narration is made available</td>
</tr>
<tr>
<td>(Scheduler)</td>
<td></td>
</tr>
<tr>
<td>Plot time</td>
<td>The temporal structure of the narration of the story</td>
</tr>
<tr>
<td>(Director)</td>
<td></td>
</tr>
</tbody>
</table>
Blast Theory’s *Day of the Figurines* consisted of a developing story over 24 days, relating each day to an hour in the life of a fictional town populated by game players. These players signed up at a location containing an augmented reality representation of the town. They contributed to the story of the town through text messaging either in terms of reacting to the authored story or developing their own sub-plots. Thus it is possible to chart the five layers of time as the story arc was written then processed before being delivered over time allowing the participants to interact or view others interacting at time of their choosing. This complexity, supported by extending timeframes, operates in a completely different way to those times expressed in the designated REs of the above Literature Review. In the latter cases there is a synchronicity between the actions of the user and/or the computer. This has been a tacit and conventional definition of an RE: that realtime interactions are the prime focus and prime mover of RE. This was condensed by Krueger to the epithet: “Response is the medium!” (Krueger 1977, p.430) i.e. synchronous activity defines what an RE can be. However it is possible to propose an RE that operates over an extended period of time not only in terms of tenure but also in terms of the periods enabled between interactions and also the viewing of those interactions. In this regard asynchronous interactions *a la Day of the Figurines* could be possible within an RE. There is scope for these extensions to be explored within the remit of the present research.

3.4.3 Locative Media

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54 It should be noted that Bedford and Giannachi privileged “realtime” in their definition of MR (Benford and Giannachi 2011, p.3) enabling a connection to be made more readily with RE yet their use of the five times of interactive narrative extends that MR definition considerably and challenges what an RE could be.
The origin of the term “locative media” is attributed to Karlis Kalnins with its first public use as part of a panel title at the 2003 ART + Communication Conference in Riga, Latvia which Kalnins attended (Locative Media 2003). “Locative media and Psychogeography” was the full title of the panel with the latter a term coined by Guy Debord, a founding member of Situationists International, suggesting “…playful and inventive ways of navigating the urban environment in order to examine its architecture and spaces” (Tate 2016). It is not surprising that the focus of locative media as a new media art form has also been in urban environments as locations of concentration of peoples and political/social/artistic action through various forms of media. The arrival of portable GPS technologies enabled a logging of position that could be used to plot either people or objects in environments, hence “locative”. Examples of locative media include location-based games e.g. Botfighters 2001; Geo-cashing, a form of treasure hunt with the goal of finding a “geo-tagged” object and the “check-in” application Foursquare. In the latter case, the ability to check in and “own” a location was used as means of spreading the idea i.e. if one is first to a new site e.g. a coffee house one can claim it and if sufficient visits accrue maintain oneself as “mayor” of that location. The significance of Foursquare as a form of locative media is both in terms of its overlay onto real world sites and the social component of that overlay. Studies of Foursquare and related social media offer analysis that can be assessed in terms of its aptness for RE. Of further significance, further to the themes raised in the previous sub-section, is the focus of such studies around identity in relation to real spaces and the concept of time.

In the former case Schwartz and Halegoua’s “… concept of the “spatial self” [provides] a theoretical framework encapsulating the process of online self-

As Rowan Wilken puts it in “Locative media: From specialized preoccupation to mainstream fascination”, “[T]he field of new media arts has been at the vanguard of exploring both the creative possibilities and critical implications of locative media, and is where the bulk of the literature on locative media to date is found” Wilken 2012, p224).

It should be noted that from 2014 the check-in feature was migrated to a new app, “Swarm” with Foursquare reconfigured as a local search application (Wilken 2016, p.181).
presentation based on the display of offline physical activities” (2015, p.1). Furthermore, “the concept of the spatial self as an effort to identify and examine the ways in which individual and collective agency is routinely enacted by participants within these systems” (Schwartz and Halegoua 2015, p.5). This shifts the attention from the technologies of locative media to what affect such systems may have on the people using them. The reference to the relationship between an online digital layer and real world activities is of interest to the study of an extended definition of RE. As with AR, Schwartz and Halegoua acknowledge the existence of analogue expressions of the “spatial self”, for example, the use of postcards to tag tourists to a particular location and connect to others there and back at home (2015, p.5). They make the important point that it is the dynamic nature of digital systems that offer enrichment with regard to a person tagged at a location. There are specific possibilities of agency through “intentional socio-cultural practices of self-presentation that result in dynamic, curated, sometimes idealised performances of who a user is, based on where they go” (Schwartz and Halegoua 2015, p.5). Furthermore they suggest “that through social networks like Instagram, Foursquare and Facebook participants present their spatial selves without explicitly being invited to do so, in more “organic” circumstances than via directed research studies” (Schwartz and Halegoua 2015, p.6). This is a highly significant point, perhaps underplayed by the authors, that the agency on offer extends to people using and adapting these systems “beyond the brief” and further, this repurposing, because held online in persisting social media, enables researchers and members of the digital public to access, respond to and further repurpose that social representation. Following Frith (2012) Schwartz and Halegoua (2015, p. 7) do explore some aspects of this agency including the forms of content contributed: “...the traces that manifest on these systems are usually filtered, choreographed displays of mobility and experiences of place that play a significant role in identity performance as well as sociability”. There is an editing process at work and not all places are expressed through locative media equally because of that process.
They then offer (2014, p. 7) a definition of the “spatial self” that can explored with regard to the concept of RE:

The spatial self shaped by the character of a physical place and the ways users associate themselves with physical place. The character of a place is a social construct that is continuously created and adjusted by the plethora of visitors to that location and the connotation of that place. When a user chooses to broadcast their location in relation to a specific venue, they are relating themselves with the values and social groups that are represented by that specific physical place.

This illustrates the interaction between the developing spatial self and the physical space i.e. both are being constructed through the process so that not only is the user relating to the locations values/social groups but they have the opportunity to enhance those values/social groups. Thus this form of activity conforms to an extended definition of responsive environment because the digital social layer enables responsiveness in the space and through substantial opportunities for agency. As Schwartz and Halegoua put it (2015, p.12): “Through investigations of the spatial self on social media, researchers can gain access to diverse experiences of geography...”.

Furthermore those experiences/apprehensions may change over time i.e.

Places have multiple meanings to the same person or to different types of people, and these meanings may change over time. Representations of the spatial self can provide an entry point into accessing and reading these polyvocal interpretations and meanings of place. The contexts and situations under which these digital expressions of place are produced inform the image or check-in and the motivation for location-announcement. (Schwartz and Halegoua 2015, p.12)

Schwartz and Halegoua go on (2015, p.12) to make the important point that such enhancements may be more performative than precise i.e. that they may be an outcome of play that does not represent other aspects of the contributor identity. Thus a warning to be careful regarding the extrapolation of such evidence is flagged up.
This definition of spatial self as a suitable framework to describe locative media has been taken up in a subsequent paper by Michael Saker entitled “Foursquare and identity: Checking-in and presenting the self through location” (Saker 2016). Saker conducted primary research through interviews with Foursquare users who endorsed Schwartz and Halegoua’s notion of the “spatial self” but further indicated that (2016, p.13),

...the reality of the identities on display were compounded by, as well as predicated on, the digital representations of their physical activities. An important part of this process is therefore the extent to which the spatial self allows the self presented to assume the reality of its performance.

Thus the spatial self appears to be something that is both constituted out of real space activities but then reinforms and supports those real space activities. To emphasise this point Saker quotes Cramer, Rost, and Holmquist (2011, p.9): “Ultimately, what this means is that location has changed from being something you have (a property or state) to something you do (an action)”.

It is possible to create a responsive environment that encourages polyvocal interpretations and meanings of that place, that expresses both a sense of having a place but also enacting that place. Indeed the RE’s purpose could be to enable alternative representations of that place. These capabilities, supported through a digital social layer interacting with people in real places, potentially enrich both the capabilities of an RE and thus the concept of a responsive environment. There is scope for these extensions to be explored within the remit of the present research.

Schwartz and Halegoua (2015, p.6) follow Hogan (2010) regarding the concept of time relating to locative media practices i.e. “selfpresentation practices on social media can be split into performances, which take place in synchronous “situations” and artefacts that take place in asynchronous “exhibitions.” They apply Hogan’s approach thus (2015, p.6):
“...users are both sharing their location with others in real time [supporting synchronous activity] as well as archiving these physical actions which are then aggregated and presented in various forms such as dots on a map or summarised statistics [supporting asynchronous activity].

There is also the possibility of further performances that draw on those artefacts as stimulus for further activity in other situations. Referring back to The Five Layers of Time, Table 3 above, it can be seen that Story time, Plot Time and Schedule Time are in the hands of the contributor. However, the notion of “participant” is problematised because in locative media the contributor has taken the role of author yet is also participating in the system. Furthermore those who interact with this author may be also in a contributor role, also contributing synchronously. Those who encounter the artefacts of these contributions asynchronously may also be contributors perhaps using previous contributions to create new “situations” or “exhibitions”. There is value in The Five Layers of Time approach from a production perspective and a roll out of a media art project that conforms to effectively a traditional form of media content - audience mode. That is its strength. However, the opportunities for agency are much more varied when people contribute synchronously and asynchronously through digital social layers supported by social media.

The analysis further supports the possibility of developing REs that enable both synchronous and asynchronous activity supported by a digital social layer. There is scope for these extensions to be explored within the remit of the present research.
3.5 Conclusion

These themes shift the emphasis from the relations between sound and vision alone, as promoted, for example, by the “See this sound” initiative (Daniels and Naumann 2010, 2011), and the ambient and functional services offered by “Aml” (Lino, Salem and Rauterberg 2010) to the inter-relationships and interactions between user/viewers and the responsive environment. This formulation addresses the simple question: what are these responsive environments for? The logical answer is that they should not be ends of themselves, cataloged in terms of the technologies they use as ends in themselves. In short, the hypothesis is that:

Responsive environments can be designed to enable people to dynamically respond to those environments and not just be in a passive role/position in relation to the content.

The following two chapters seek to explore what this statement can mean.
4.0 Chapter Four
Critiquing Responsive Environment Principles in Practice

4.1 Introduction

Further to the explorations of Chapter Two, the premise is that there should be a shift from the inter-connection of sound/visuals and other sensory inputs alone to the inclusion of presence in the description and analysis of responsive environments. The study of RE investigations forces an inclusion of the presence of the user/visitor. This is presence in the widest sense involving both users and digital and mechanical components. This conceptualisation of “presence” draws on the work of Lombard and Ditton (1997) who proposed six aspects:

1. Presence as social richness – one sees the environment as socially welcoming.
2. Presence as realism – one sees the environment as representing a real/recognisable space.
3. Presence as transportation – one is drawn cognitively into the environment.
4. Presence as immersion – one feels that one is “inside” an environment.
5. Presence as social actor within medium – one feels that one can interact in the environment.
6. Presence as medium as social actor – one feels that one is interacting with real people within the environment.

All of these aspects work under a question of degree. For example, the extent that one may feel that one can interact with an environment could vary considerably. Furthermore, the qualities of that interaction, e.g. mutualism or supplemental modes, may also vary. However, these criteria provide a rich resource to aid the assessment of a responsive environment.

In comparison, a focus only on the inputs and outputs of the system point to the technologies of delivery rather than also including the users/visitors and their
journey both physically and intellectually and/or emotionally through the environment. This includes presence within, and presence out beyond the responsive environment informed by the content from the RE (drawing on Moore and Anderson’s concept of “productive”), perhaps calling for a seventh category to be added to the list.

The inclusion of presence leads onto facilitating opportunities for the user/visitor in the environment. This stimulated a desire to develop a philosophical approach to the research project before working through the practical themes gathered from the literature review. Thus, there is a move from an overall philosophical analysis down to developing themes and leading to the development of the first practice project and then the second.

4.2 A Specific Philosophical Approach To The Area of Study: A Philosophy of Practice

The move towards a specific practical investigation from the perspective of this theory/practice research is to begin by exploring a philosophy that provides a theoretical imperative for the work. The move from theory into practice is justified because of the disparate and isolated investigations into responsive environments. One way of drawing these separate phenomena together is to explore over-arching philosophical approaches that can help to connect up these elements at a theoretical level. The aim is to provide meta-level principles that can then inform the practical themes identified from the literature review.

Luciano Floridi’s “Information Ethics” offers a way to approach the concept of responsive environments from an over-arching position that focuses on the

58 As stated above, this compares with a practice-based PhD that may have a practical focus that is then justified through parallel theoretical investigations.
import and implications of digital technologies. Floridi’s argument for the need for such an approach begins with a re-assessment of the form of ethics that is required in the 21st Century:

The term ‘ecopoiesis’ refers to the morally informed construction of the environment based on [an] object- or ecologically orientated perspective. To move from individual virtues to global values, an ecopoietic approach is needed that recognises the agent’s responsibilities towards the environment (including present and future inhabitants) as its enlightened creator, steward or supervisor, not just as its virtuous user and consumer. (Floridi 2010, p.17)

Seen from the perspective of a practitioner engaged in the area of study, this statement can act as a call to both create art in/through an environment and consider the “environmental” implications of that. “Responsive environment” from this perspective shifts the attention from architectural responses to human action to a state whereby both the stimulus and the response in a RE is human-focused, facilitated by the practitioner’s input in the environment. Furthermore, the move from an individualistic promotion of personal virtue to forms of social and global (as in outside the personal environs) awareness can be facilitated through responsive environments (cf. the work of Klüver: Klüver, Rose, Martin 1972 and Bentley et al 1985). Furthermore, the ethic by which an environment is constructed can also embody forms of engagement that encourage expansive and

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59 Floridi is chosen over other ontological and imminent forms of analysis e.g. Deleuze and Guattari “assemblages” (Deleuze and Guattari 2014); “performativity”, following Michael Foucault, with a focus on the acts of people (Butler 1993); Brian Latour’s Actor-Network Theory, the use of social objects (Latour 2005) or Pierre Bourdieu’s theory of practice (Bourdieu 2006). Each of these approaches may offer a means of exploring responsive environments in part or as a stand-alone critique. However, none have been found in use through the literature review. Ihde’s phenomenological approach was applied but found wanting in this regard (Grunkranz 2010). The notion of social objects was extrapolated to posit “the internet of social things”. Floridi’s approach is chosen because it seeks to place people in relation to information and the digital and, though set at an ethical level, it is an expansive and social approach to the environment together with people and technology. There awaits the application of the aforementioned major ontological theories to responsive environments.

60 “Ecopoiesis” meaning “environment making” (Oxford Dictionaries 2015b).
productive roles for individuals (cf. Moore and Anderson 1969 and Peterson 1991).\textsuperscript{61}

Floridi moves out from an examination of environmental ethics to their application to the similar processes in the “Infosphere” (Floridi 2010) i.e. the digital “world” in its entirety. Put simply, agents can contribute positively to the growth of the Infosphere in the same way as they may choose to recycle their bottles at the bottle bank. This is about the development and sustenance of two environments: one physical, one digital. Furthermore, Floridi puts forward a description of the human genus that can implement this process, an alternative to \textit{Homo sapiens} or \textit{Home faber}, i.e. \textit{Homo poieticus}. The derivation from the Greek \textit{poiesis} meaning “to make” and also the derivation of the word “poetry” giving a composite of “creative makers” (Oxford Dictionaries 2015d):

\textit{Homo Poieticus} concentrates not merely on the final result, but on the dynamic, on-going process through which the result is achieved. One of the major challenges facing \textit{Homo Poieticus} is the possibility of negotiating a new alliance between \textit{physis} [nature, the world] and \textit{techne} [applied knowledge, technology].\textsuperscript{62} (Floridi 2010 pp.17-8)

The motivation for this approach is to devise a form of ethics based on constructionist values that move beyond a subjective, virtue-based ethics with a very local focus on individual moral growth to a form that encourages the role of people in \textit{continually} affecting not only their own sphere but also the world beyond.\textsuperscript{63} Human beings bridging nature and technology: two far-reaching phenomena.

\textsuperscript{61} There are overlaps in the criteria between Floridi’s “enlightened creator, steward or supervisor, not just as its virtuous user and consumer” with Moore and Anderson’s “patient, agent, reciprocator and referee” (1969 pp.577-78).

\textsuperscript{62} Floridi is drawing a distinction from \textit{physis} and \textit{techne} as used by Heidegger is his concept “enframing” (Heidegger 1977) with its focus on specific instances of activity through discrete inter-connections between people, the world and technology and the examination of global, yet ontological relationships between people as enlightened creators, stewards or supervisors of the world and technology.

The significance of Floridi for the research into responsive environments is in terms of the positive possibilities that come to light from taking an *ecopoietic* approach to the construction of the responsive environment: what is to be promulgated that relates beyond itself? This need not be an aspect of environmentalism but draws on the environment. The important thing is that the Floridian perspective offers a challenge to the practitioners with respect to responsive environments. The *modus operandi* of this research project draws on this latter ethic and that the practice projects developed should reflect that ethic. However, before critiquing the themes gained from the literature review there is a need to get closer to the user/visitor as an active agent responding to a responsive environment.

### 4.3 The Participant - The Protagonist

The middle ground between the Floridian philosophy of “information ethics” and the focus on the practical staging of responsive environments has been occupied through extensive research, from Claire Bishop and others, into the concept of “participation”. For Bishop, this has been an intellectual journey from the position of enthusiast for things participatory (cf. Bishop, *Participation*, 2006) to a far more pessimistic position regarding the effect of participation (cf. Bishop, *Artificial Hells: Participatory Art and the Politics of Spectatorship*, 2012.). This move is in part due to a reassessment of Nicolas Bourriaud’s *Relational Aesthetics* that pointed to the sustained interest by artists, through the late 1990s, towards audience participation in various forms (Bourriaud 2002). The main critique levelled against Bourriaud was that he was privileging participation even when there was little outcome from it. In *Artificial Hells* Bishop specifically addresses this arguing that an artwork whose ethic is sound but whose outcomes are not transforming is inadequate (Bishop 2012). This leads on to a mistrust of positive messages from artworks and, in a section headed “The End of Participation” (2012, p.284), leads to a call for “…a reassertion of art’s inventive forms of *negation* as valuable in their own right”. Furthermore, Bishop is not the
only academic to despair of the possibilities of participation as a positive force. Back in 2001, Bill Cooke and Uma Kathari’s *Participation: The New Tyranny* questioned the involvement of the populus as slowing public developments and, more recently, in 2010, Markus Miessen’s *The Nightmare of Participation*, has taken a quixotic view of participation as supporting political consensus requiring charismatic leaders to challenge that. In all these cases participation is seen as part of the problem as opposed to the solution. This pessimism is in sharp contrast to Floridi’s project through the same time frame of the 2000s arguing for engagement in both the natural and digital worlds. The key point is the notion of presence as found in a number of contexts in the literature review and further enriched by reference to Lombard and Ditton. Presence matters in addressing the purpose of such responsive environments and, put simply, whereas participation may be seen as an encumbrance in the domains of public works (Cooke and Kathari) or political consensus (Miessen) or in Fine Art (Bishop), for the present research it is a defining aspect of a responsive environment. Therefore, to borrow Bishop’s term a “reassertion” of participation is required but, given the level of criticism, a reassessment should be included too, to avoid “presence” only inferring a passive or negating attendance.

In this regard, Nina Simon’s *The Participatory Museum* offers a continuum of participation with regard to presence in relation to a museum (2010 p.26). This works in terms of an ever-increasing social component as she terms it: from me to we. It is striking how these stages, see Table 4 below, map to Moore and Anderson’s roles i.e. Stage 1: Patient; Stage 2: Agent; Stage 3: Reciprocator (where content from others can be viewed/critiqued but only in terms of the original content); Stage 4: Referee (where individuals can decide upon the terms of the reference for the content) and, then, there is Stage 5.64

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64 Simon does not reference Moore and Anderson.
As shown in the quote below, Simon wrestles with the forms that Stage 5 can take. This is her attempt at incorporating Moore and Anderson’s notion of “productive” i.e. that museums should inculcate users/visitors in ways that enable use of knowledge outside of the museum, but how is that knowledge to be supported without facilitators?

Facilitated educational programs like camps or re-enactments provide stage five opportunities to work in a team or group. The problem is that when the facilitator isn’t there or the event isn’t happening that social engagement ceases to exist. Designing stage three and four experiences can lay the groundwork to support and encourage unfacilitated social experiences. These frameworks enable visitors to do it for themselves whenever they like. (Bishop 2010 p.26)

Simon offers forms of networked presence as the means by which this visitor-led activity could be supported. However, a cautionary note should be struck. The apparent close match between Simon’s stages and Moore and Anderson’s roles should not distract from the naming of this continuum as “me to we” with the surprising outcome that the further one is away from the content of the museum the more social a relationship one may have with it. Put bluntly, we may not be individuals consuming content in a museum (as we may be individual’s in Moore and Anderson’s learning labs) but many if not all activities in museums have a
social component, either because we have people with us or we interact with the other people there. Thus, Simon’s stages can be socialised and so better represent the reality of museum attendance simply by replacing “individuals” with “people”. This process of socialisation is an important one and in accordance with aspect six of Lombard and Ditton’s conceptualisations of presence above: “Presence as medium as social actor” (Lombard and Ditton 1997), it enriches the notion of presence in such environments, providing forms of participation as social activities. However, it provides no pointers as to purpose of those activities. Moving back in time, we discover Bishop’s Participation offering three purposes relating to participation that can be applied to responsive environments (2006 p.12):

1. Authorship - how to enable others to author with respect to a responsive environment.
2. Activation - that agency can be developed and sustained in and further to a responsive environment.
3. Community - social connection can supported and further enabled in and further to a responsive environment.

The power of this approach is that it socialises Floridi’s ethics i.e. “enlightened creator, steward or supervisor, not just as its virtuous user and consumer” (2010 p.17) and reaffirms that there should be a social activity in terms of participation/engagement. This can be “authoring” for one's own purpose or to share content, “activation” of one's own energies or with others, “community” in terms of one’s own immediate sphere or beyond. However, in each case, the more advanced forms i.e. “Supervisor” (Floridi), “Referee” (Moore and Anderson), “Activator” (Bishop) do not sit well with the simple definition of “participation” i.e. “the action of taking part in something” (Oxford Dictionaries 2015c). Indeed, it is Bishop’s term “activation” that most readily moves beyond the present context compared with “supervisor” and “referee”, both indicating management of current or future rules, even though there is the sense of a local form of controlling and not just participating in activities. Thus, it is proposed that the term “protagonist” may be more apt in these instances of steerage,
control and activation.\textsuperscript{65} This also accords with Moore and Anderson’s concept of “productive” i.e. of activity in a responsive environment representing a shift from learning how to do something to taking control of that learning in the original and other contexts.\textsuperscript{66} This activity may be in or further to the responsive environment.\textsuperscript{67} This offers a counter to Miessen’s view of the inertia of consensus caused by participation, i.e. productive citizens can be developed/supported in responsive environments rather than despite them. In order to do this the themes identified in the literature review should be employed in the creation of such constructions as they predominantly focus on engaging with users/visitors in the responsive environment. These themes, taken together with Bishop’s modes of participation, offer a template to explore how responsive environments may be created to support such activities from participants to protagonists. The following section analyses this conjoining of concepts with a view to devising specific practice projects to explore these issues.

4.4 The Development of Practice to Incorporate Contemporaneous Initiatives

This sub-section documents the personal journey taken through the development of practice drawing on contemporaneous initiatives which have enhanced the practice projects through components not discovered in the literature review of responsive environment research. There is an overview of the practice development in the research and also the personal journey as an academic practitioner drawing on initiatives from outside the project, the limitations of designated REs and from personal experience.

\textsuperscript{65} “Protagonist” in the sense of “the leading character or one of the major characters” and “an advocate or champion of a particular cause or idea” (Oxford Dictionaries 2015e).

\textsuperscript{66} As quoted above, Krueger writes of: “An experimental parable where the theme is illustrated by the things that happen to the protagonist-the participant” (Krueger 1977 p.). However, the participant becomes the protagonist in the parable i.e. is still the participant.

\textsuperscript{67} The term “protagonist” is also more befitting of the role described by Simon: “Designing stage three and four experiences can lay the groundwork to support and encourage unfacilitated social experiences. These frameworks enable visitors to do it for themselves whenever they like”. (Simon 2010, p.26).
As mentioned in section 3.7.1 above, the KikiT VisuoSonic Research Group (KVS) had experimented with a range of initiatives using computers in environments. This was a starting point with regard to reflecting upon the findings from both parts of the literature review i.e. both the previous research directly related to RE and the contemporaneous research into AR, MR and Locative Media. Initially the practice research focused on MR as there seemed to be scope to incorporate such components within an RE. Extensive research, specifically into the capabilities of the Microsoft Kinect was conducted during the summer of 2011 both in terms of developing the relevant skills and in the creation of some possible instantiations, see Figure 16. Further to the research work with KVS the focus was in terms of making the graphical elements sound sensitive i.e. the representation of a people/room would oscillate to sound effects, voice or music.

Figure 16: Experiments in making the Microsoft Kinect responsive to Sound and Movement
The MR aspect of this approach would rely on the output being projected back into the installation space as an additional digital layer and facilitating a mix between a real space and the representation of that space. This was a localised version of the concept applied in Blast Theory’s “Can You See Me Now?”: An overlay of the real space with digital representation of the real space but without an online component.

Although this approach constituted an extension of the previous KVS research upon reflection this could not be seen as a qualitative development as other forms of representation had already been used by the group e.g. through webcam input. Thus from a personal development perspective further practice-based research had to be done.

During 2012 contact was made, via Southampton Solent University Research Centre, with Periplum Performance Group (Periplum 2016) with a view of a joint project. Through detailed discussions a variety of projects, led by the group, were mooted. A proposal was developed for the Brighton Digital Festival (Brighton Digital Festival 2016) of that year utilising QR codes as part of a street-based performance.⁶⁸ Although the project did not gain acceptance to the festival the technology was attractive in terms of what it might add to an environment.⁶⁹ Furthermore, Levin and Foster, had recently developed their “QR Codes for digital nomads” (2011) that used QR codes in public spaces as an update of “hobo codes” to indicate the presence of police or a good place to ask for food. Consequently through later 2012 and early 2013 experiments were conducted into the possibilities relating to QR codes (Figure 17) and “Markers”, using Processing and NyARToolkit (see Figure 18), to show augmented content (Processing 2015).

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⁶⁸ QR standing for “quick response” code (QR Stuff 2016).
⁶⁹ There was later an opportunity to contribute digital components to a following project: #WeAreAllSpartacus. (Periplum 2014)
Figure 17: Using QR codes to overlay content. In this case a Kinect-derived self-portrait. Left hand picture showing image over paper-based QR. Right hand picture over QR code on iPad.

Figure 18: Three experiments with AR marker content. The top two pictures show a similar output to the use of QR codes. The bottom two images show that a marker can work even if hand drawn.

These experiments proved that it was possible to produce a range of effects but in each case the environment had to populated by esoteric signs that would not work unless well lit, clearly in view and, if markers, one way up. These aesthetic
and technical limitations encouraged a reframing of the idea around face-detection and specifically the use of the Ketai face-detection library with Processing ported to an Android tablet (Ketai 2013). Figure 19 shows experiments in this mode. A key advantage of this approach was the relationship of the content to the people present in the space i.e. the only requirement for the triggering of the AR component was the arrival of people into the space. However, as can be seen on the picture top right the triggering would not work if the person’s face was partially obscured because of a beard. Experiments with speech bubbles and masks with eyes utilising PNG transparency were an initial focus. This progressed to the level whereby live generated text could be added to the speech bubble i.e. figure 20.

Figure 19: Early experiments with face detection using masks and speech bubbles. The bottom two pictures showing an image pared down to discover what the Ketai library was looking for.
These practice-based experiments resulted in stable applications that could run on Android tablets or phones to a level of consistency required for a public installation. Thus the process of networking began to see if a suitable location/event could be found for the first practice project. Shortly after, in April 2013, there was advanced notice of an exhibition at Dimbola Lodge Museum and Gallery celebrating Louis Carrol’s Alice. Details of this process are supplied below in sections 4.5 - 4.8 and in Appendix B.

The closed form i.e. offline installation format served its purpose in terms of allowing a reproduction of aspects of Lozano-hemmer’s *Body Movies*. However, although the limitations still allowed for some protagonist behaviour and the use of AR in a responsive environment was novel, the same limitations meant that any benefits from this approach were also limited in number and scope. An assessment of the findings from the first practice project can be found in Sections 4.7 and 4.8 below.

Concurrently with the development of the first practice project a Senior Research Fellowship was gained on an EU funded research project to investigate the use of online tools to support small and medium sized enterprises (SME) in Europe. Cross-Organizational Assessment and Development of Intellectual Capital
or CADIC (2013) required the development of online services, web platforms and communications systems. This role, further to the teaching of social media and other web-based technologies from a promotional and social perspective, enabled the development of skills useful in the move to the second practice project incorporating approaches learned from the study of mixed reality practice including Blast Theory’s work and Bedford and Giannachi’s analysis.

The incorporation of an online component relative to the RE (cf. Blast Theory’s “Can You See Me Now?”) required a considerable reframing of the project to facilitate an effective use of a digital layer. Importantly this should operate in a “spatial self” (Schwartz and Halegoua 2015) mode i.e. as a system to enrich a real space, in this case an RE and that content and those systems should further enrich those contributing to it. The research achieved in the CADIC project was directly relevant to this as it worked to an ethic of enabling self-expression both in the web platforms systems and, as a consequence, back in the real spaces of departments, factories and administrative centres. In the CADIC case intellectual capital could be utilised to the benefit of the company through the web platform. This was a business mode of “crowdsourcing” (Ooman and Aroyo 2011) through the voluntary submission of (intellectual) content. However, as much as the system was designed to enable the free movement of content within it, there was still the requirement for secrecy with regard to those who were inside the CADIC platform. Hence the system was built bespoke on protected servers to enable those that signed up to the platform to feel secure within it. These experiences fed into the development of the second practice project. After a successful transfer from MPhil to PhD the offer was made to contribute to the science tent (as Southampton Solent University representative) at the Bestival music festival in September 2014. Unfortunately the place was not confirmed until just before in August which meant that the second practice project, reframing the Bestival site as a safari park, had to be built in two weeks. The Wild Things in Captivity project drew on the recent experiences with online systems, not closed platforms as in the CADIC case but Facebook and Twitter for
the crowdsourcing of content into online public repositories under the themes: Photo Safari; Bioacoustic Recordings; Species Dispersal; Species Tracking and Habitat Renewal. Bedford and Giannachi’s use of time is apt in describing the process of the project as the Author role was applied before Bestival-goers were asked to interact with and/or perceive the platforms, taking on the Director and Scheduler roles. Indeed, the Author role was enacted in a short time period. See sections 4.9 - 4.12 and Appendix C below for more details on the development and assessment of the project.

The lessons learned from the Wild Things in Captivity were of two levels i.e. that technical and administrative planning needed to more rigorous but, more importantly, for the concept of “the protagonist” the structure of the project should enable more personal and self-directed creativity by those engaging with the project. These aspirations coalesced around proposal for a paper, worked on in the aftermath of the Wild Things project, to the International Symposium on Electronic Arts (ISEA) in Vancouver. The proposal responded to Miwon Kwon’s use of Marcel Mauss’ dictum relating to debt as applied to artistic endeavour in her paper “Exchange Rate: On Obligation and Reciprocity in Some Art of the 1960s and After”. The quote:

As we know from the work of Marcel Mauss, the French sociologist and author of the hugely influential ‘Essai sur le don’ (‘The Gift’, 1924), as well as subsequent theories of the gift, there is no such thing as a free gift or entirely disinterested, uncalkulated giving. (KWON 2011, p.232)

This seemed unequivocal and when applied in an arts context results in a view that there is no way to escape the control/pre-conditions of the artist and thus no opportunities for protagonist behaviour. However a close study of Mauss’ research discovers that he based his studies on tribes around the North-west Canada that reproduced the social relations of the Paris he knew, hence enabling a cross-cultural “verification” of his observations. He did not look at, for
example, the Coast Salish peoples near Vancouver who rather than conferring
debt through conspicuous consumption shared their food wealth with other tribes
so that all may survive (Richards 2015). This, at first sight, esoteric point was
highly important from a personal development perspective as it provided a trope
that supported the notion of protagonist behaviour in artistic context. From this
perspective the notion of Author, Director and Scheduler times was not “wrong”
in offering a prescription/context for interaction with and/or perception of a
project but it was also possible to envisage a project that used mixed reality and
incorporated the user-control of, for example, Fourquare in the original version,
with an emphasis of the development of a “spatial self” (Schwartz and Halegoua
2015), relative to a real space. Furthermore there should be an emphasis on a
community-based project, drawing on the Coast Salish experience: a digital
social layer representing and supporting a community.

These ideas coalesced around the third practice project, the #LoveWight project
with the creation of a tool in the shape of a hand sign enabling a connection to
be made to the Isle of Wight but also enabling a creative approach to that
connecting. Alternative hand signs, differing contexts, “Photoshopping”,
composite pictures creating narrative, creative looping of signs and a redesign of
the hand signs to use arms instead all showed forms of expression that extended
the #LoveWight concept and did more than simply reproduce the format
supplied. Furthermore the use of hashtags to enable “love” to be shown towards
the Isle of Wight resulted in a wide range of positive tags. Furthermore, a form
of “checking-in”, a la Fourquare, was incorporated in the project as people could
claim place either on the Isle of Wight or abroad and be #first. Additional
hashtags were included and Instagram location tags were also used. Although a
critical mass was not reached whereby #LoveWight was taken up beyond the
project over 300 people contributed and a range of indicators were obtained in

70 It also flagged caution with regard to the assumptions attached to “As we know”.

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terms of qualities of protagonist behaviour in this instance. Details of the third practice project are available below in sections 4.2 to 4.5 below and Appendix D.

In summary the personal journey taken through the research process has been enhanced by reference to initiatives outside of the scope of designated REs and the experiences relating to online platforms and research into the notion of artist’s control over their projects. This journey has resulted in a more sophisticated understanding of what an RE could be as well as what an RE is. Detail is now supplied on the three projects relating to the themes drawn from the literature review and with the additional input from what has been assimilated from contemporaneous initiatives.

4.5 First Practice Project Development

Hypothesis: Even when a construction is made that places the visitors in the role of “patient” (following Moore and Anderson, 1969) there may still be opportunities to repurpose the responsive environment and/or its content.

This hypothesis addresses the following research questions developed from the themes collated from the literature review:

1. Can an environment that is configured to offer limited roles (“patient” level) still stimulate users/visitors both inside and outside of its remit?

This takes a much more positive approach to Krueger's response to “erroneous conclusions” from his subjects. Any such re-interpretation/repurposing should be seen in a more positive light.
2. Can an environment that is configured to offer limited positions (patient level) still stimulate users/visitors both inside and outside of its remit?

This relates to the possibilities of the shifting of positions with regards to the responsive environment and its content across Patient, Agent, Reciprocator and Referee (Moore and Anderson, 1969 p.568).

3. Can repurposing opportunities arise even when the content is closely locked, i.e. allowing limited input from the user/visitor and, if so, what forms does that repurposing take?

This compares with the delimiting opportunities on offer through “Interactive Ads for Shanghai Stadium Subway Station” (Lino, Salem and Rauterberg 2010 p.358).

4. What forms of learning experience are possible even when the content of a responsive environment is locked down?

This draws on Power’s dichotomy of trivialised versus liberatory interactions.

5. How can a responsive environment use sound, visuals and presence to enable forms of enrichment?

This moves the principles on from that of “Audiovisuology” (Daniels and Naumann 2010) to include the user/visitor’s presence and involvement.

6. What value and/or values are enabled in and through the responsive environment?

These values must come from the context of the environment in the first instance.
The proposal for the first practice project is that these themes can be explored through the development of a simple interface that ostensibly offers the “patient” role i.e. that visitors are positioned to receive content (following Moore and Anderson) but may yet enable more sophisticated responses through the repurposing of the content and that that illustrates a more protagonist role at work even in constrained circumstances. Thus, from a theoretical perspective the remit for the first practice project requires minimal activity in terms of learning what to do and that there should be minimal interaction i.e. that (following Kortbek and Grønbæk, 2008) the visitors’ presence would be sufficient in the construction. Concomitant on these criteria are the limited opportunities for expression of Bishop’s categories of “authorship”, “activation” or “community”, the extent or otherwise to be determined through the application of the first practice project.

The Dimbola Museum and Galleries in Freshwater, Isle of Wight was approached regarding the possibility of staging the first practice project. Through a process of discussion and demonstration the Dimbola team offered the opportunity to create an installation, named “Mad Hatter’s Magic Mirror”. Using an Android app on a tablet character heads from Lewis Carroll’s *Through the Looking Glass and What Alice Found There* (Carroll 1994) could be super-imposed onto visitors to their “The Wonderland of Alice” exhibition from July to October 2013. This form of augmented reality would satisfy the Dimbola team’s, and specifically the curator, Gail Middleton’s desire to bring the visitors into the world of Alice.

A conceptual reference point was the work of Brenda Laurel i.e. *Computers as Theatre* (Laurel 1993). In the first edition of the book Laurel’s approach focused upon defining interactivity as “[T]he ability of humans to participate in actions in a representational context” (1993, p.35) and “[T]o act within a

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71 See Appendix B for details of that development.
72 Augmented reality means the superimposition of computer graphics onto a real scene i.e. the Dimbola gallery (cf. Mashable 2013 for more detail).
representation” (1993, p.21). “Act” in this context relates to Aristotelian
dramaturgy. The representation, as the world of Alice, could enable visitors to
the exhibition to feel that they were part of the action. However, Laurel’s
interest in dramaturgy was at a more metaphorical level and she cites
problematic examples were the audience joins the actors on stage but the
“[p]eople who are participating in the representation aren’t audience members
anymore [...] they become actors” (Laurel 1993, p.17). Laurel contrasts
computer-based representation thus: “Whether the magic is created by
hardware, software, or wetware is of no consequence; its only value is in what it
produces on the “stage”. In other words, the representation [on screen] is all
there is (Laurel 1993, p.17). However, an augmented reality installation in a
gallery can draw on conventions inter-relating the exhibition to the visitor/users.
This Laurel has subsequently acknowledged in her second edition of Computers
as Theatre (2014, p.198):

In Chapter 1, I argued that “the representation is all there is.” But in
augmented and mixed reality, what we make of the part of the real world
on which things are overlaid? We can think of the actual world as forming
part of the representation in that it becomes setting and environment. In
combination with what we have designed, we impart new meaning to the
actual world - meaning that works within the representational context...
the real world becomes part of a larger representation that we are co-
creating.

Thus an augmented reality for the Alice exhibition both draws the user/visitors
into that world and could bring Alice’s world into theirs. In turn this installation
could enable research into the user/visitors adoption of a protagonist role even
as they are positioned as participants. This shifts the co-creating from between
the designer and the environment to an inter-connection between the
practitioner, the environment and the user/visitor.

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73 This assertion mirrors Krueger’s and Kwastek’s sole focus on interactivity as Laurel so closely
inter-relates interactivity with representation.
Unfortunately, there were considerable delays beyond control of the research project with the arrival of the Ethical Policy clearance from the parent university that meant that the installation could only go into Dimbola for the final two days of the exhibition run. Although, this late entry meant that there was little time to gather data i.e. two days and no time to make adjustments to the rig, through lifecycle design in response to input from the visitors, the data gained from the experience at least can be seen as indicative (Rogers, Sharp & Preece 2011, p. 332). The justification of this consideration is given below.

The data gathering methods were questionnaires, written records of comments, video film and still photography used to assess the visitors’ interactions with the installation. These protocols followed a social science mode of analysis i.e. the exhibition as social experiment with attendant and standard methods of data gathering and analysis.

The advantages of using this installation as a first practice project include:

1. The visitors were not asked to perform any tasks or come with prior skills or detailed information in advance of the visit.
2. The use of Ketai “face detection” technology did not require any learning by the visitors i.e. they simply needed a face that could be detected (there is a caveat with regard to people with beards).
3. The installation was built into the ambience of the exhibition room and thus the aim was for it to be complementary to the general atmosphere rather than being a “stand-out piece”, see Figure 18 below. The subtlety of the interaction was designed to encourage that holistic approach.
4. Although the technology is based on an Android app built in Processing (Processing 2015) that could allow downloads to other mobile devices, the construction is discrete i.e. the output, in this first iteration at least, is in a single location. There are technical advantages of using a tablet in such a construction. For example, the profile of the installation is far smaller than if a laptop or PC were used to provide computing power, see Figure 18 above.

With regard to the forms of presence, offered by Lombard and Ditton (1997), there is some evidence that forms 1 - 4 occurred in the installation with direct comments made in this regard, see Appendix B for more details. However, the only forms of interaction with the environment, form of presence 5, were through attempts to play with the limited functionality. With regard to form of presence 6, the locked off format of the installation meant that there was little social interaction and nothing sustained.
4.6 The Evaluation Procedure

The DECIDE system (Rogers, Sharp & Preece 2011, p.456) was used to evaluate the effectiveness of the first practice project i.e. Determine the goals, Explore the questions, Choose the evaluation methods, Identify the practical issues, Decide how to deal with the ethical issues. Evaluate, analyse, interpret, and present the data.

The goals for the research were developed to determine the degree to which the visitors to the installation could be seen as protagonists even when presented with limited control over the content in the installation.

1. To record and assess how the visitors made use of the installation.
2. To gain feedback on the construction, performance and practice of the installation.
3. To record any examples of the installation being repurposed.
4. To gain feedback in terms of how the installation could be further developed.

The questions developed from the above exploration of specific themes with emphasis on the presence of users/visitors are:

*What was their role? [General Research Question 1, 5]
*What was their position? [General Research Question 2, 5]
Did they change anything? [General Research Question 3]
*Did they learn anything? [General Research Question 4]
*What did they make of the content? [General Research Question 3, 6]
Did they leave with the content? [General Research Question 4]
*Did they repurpose the content? [General Research Question 3]
What message/s did they take? [General Research Question 6]

For the first practice project, the focus was on the questions with an *. This was due to the installation not offering opportunities to change the content or take
the content away. Thus, the visitor’s role was delimited in terms of the requirement to be in the space and engage with the installation. Consequently, their position in relation to the installation was *apparently* passive: a “patient” mode.

Convenience sampling, following Nick Emmel, was the technique used to gather the data i.e. those that entered the exhibition room were asked to contribute (Emmel 2013). The content analysis of images approach, following Theo Van Leeuwen and Carey Jewitt in their *The Handbook of Visual Analysis*, was adopted (Van Leeuwen and Jewitt 2014)

First practice project statistics:

31 people visited the installation (16 women, 15 men)
One person under 10, one person 11 -17, 29 people over 18.
Seven questionnaires filled in
Six people photographed
Two people videoed

The video is held at: https://www.facebook.com/groups/ParticipantsandProtagonists/

The original aim was to obtain a sample of a considerable size. This would have been possible if the installation had run over a three-month period as planned. The period of installation was constrained to two days. The justification of the validity of this short implementation was that the “Magic Mirror” was a prototype and thus seen as experimental. From this perspective the aim is not to provide complete findings but to provide indicators towards further work. Unfortunately, the lack of time meant that there could be no on-going adjustments to the first
practice project in response to feedback from the respondents. General findings are explored below.

One positive from the installation, although lacking in quantitative power due to the small number of respondents, was the unanimously positive response to the installation: “Very good”, “Entertaining and fun” - adds an interactive dimension to the exhibition”. This being the case despite the very limited form of interaction possible (cf. Appendix B for the full data).

The actions of the visitors were captured in the following pictures.

![Figure 22: Output from the Mad hatter’s Magic Mirror](image)

The majority (27 people) stood in front of the mirror and let the action of the application play out. Indeed, as is shown, the most common attitude was either to simply stand and not move, Figure 23 or hold one’s arms either in front or behind Figure 24.
The video capture of two of the visitors is shown below.

Figure 23: Output from the Mad Hatter’s Magic Mirror.

Figure 24: The woman formed a fist to try to affect the head.

Figure 25: The woman then spreads her fingers changing the shape to affect the heads.
Figure 26: Finally, the woman placed her hand on her face and thus “deleted the head”.

Figure 27: Her companion became interested in the fact that faces would appear in parts of the image that had no face i.e. the software was interpreting something in the image as a face. She then spent several minutes moving her arms around in an attempt to create extra faces on the screen (see also Figure 28 below).

Figure 28: Further attempts at manipulating the image
The former two pictures above, Figures 26 and 27, show the visitors adopting a passive pose in relation to the “Magic Mirror”. This extends to their hiding their arms behind them. This may reproduce the normal attitude that one might have in front of a mirror i.e. there is no expectation that moving around will change what is seen. Following van Leeuwan (2014, p.100) this is an example of “representational meaning” in that the data represents common ways of behaving in front of a mirror. Furthermore, the latency of the application meant that sudden movements could cause the heads to swap from person to person. Therefore, there was a feedback loop at work encouraging static examination of the output. A number of the comments regarding how the installation could be improved mentioned this latency as an issue. Conversely of the seven respondents who described what they did five said they moved around and two said they stood still, see Appendix B for questionnaire data. This variation points to a problem of interpretation between representations. Indeed, it seems from the questionnaire that a larger percentage of people were experimenting with the installation than are represented in the photographs. However, this interpretation is provisional given the small number of respondents. Two visitors were witnessed acting out a scenario of “attacking” each other (not caught on camera). The two visitors are documented above. It may be that because one colleague decided to play with the mirror then that encouraged the other too. However, they took different approaches. One woman tried to alter the output through various hand movements, the other attempted to make additional faces appear in unusual places: two different approaches to a “referee” mode playing with the rules of the installation. In the latter case no one had previously attempted this either over the two days of the installation or in previous demonstrations. These examples, analysed from an iconographical perspective

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74 Note that the limited number of respondents obtained meant that full coding analysis was not possible, following Saldana, 2014. Hence a simple quantitative interpretation of the data is applied.

75 There is also the associated issue of the two women working under the “Hawthorne effect” of performing as they think they should (Gillespie 1991). See Appendix B for a discussion of the validity of this data.
(cf. van Leeuwan 2014, p101) indicate the stimulation of hand movements in a form of a dance, isolated in the video and screen-grabs, produce a qualitatively different form of output from those images that offer a static response to the installation. These movements are in the gallery but exist outside of the installation in part because they hide the effect of the installation e.g. a hand over the face removes the Alice character mask. This is playing with the rules in a similar way to those creating new content in the Body Movies installation i.e. outside of the prerequisites of the installation. There was not a high incidence of such a “referee” mode. Thus, this can only be described as indicators of protagonist behaviour with regards to the project and no more.  

The application of Bishop’s terms of “authorship”, “activation” and “community” has limited traction with regard to the first practice project. The authorship is simply in terms of being a body for a head to be place upon. The activation is in terms of the move into the world of Alice, into the mirror (screen). The sense of community is very limited and only in the sense of the community of Alice characters. However, the examples of “referee” mode offers a different form of “authorship” in terms of playing with the scenario (“fighting” characters), deleting out the heads through various hand movements and playing with the interface to rewrite the position of the heads.

4.7 General Findings from the First Practice Project

The aim of the first practice project was to create a simple installation that provided only passive relationships between the visitors and the rig. In the majority of cases, this was the response obtained in the range of data captured [General Research Question 1, 2 and 5]. However, in a small number of cases, a ratio of 1 : 7, there were signs of repurposing of the content away from the

76 There was no “reciprocator” behaviour as there was no means of commenting into the system.  
77 This latter case compares markedly with Kwastek’s concept of overcoming resistance in an interface rather this is enabling new content (Kwastek 2011).
simple allowance of seeing a character’s head on their shoulders [General Research Question 3 and 5]. It is contended that is visitors taking on the role of protagonists with regards to the interface through a novel form of presence, through alternative actions in the space, Figures 21 - 25 above, even when the content is heavily prescribed. The purpose of the first practice project was to see if such activity could be present. From that perspective it has been successful but “conditional to their context” (Van Leeuwen and Jewitt 2014, p. 26). Furthermore, the values of the exhibition were understood by the users/visitors, for example one comment stated: “You’ve caught the feeling of the exhibition - connecting the characters with the visitors” [General Research Question 6]. However, the response to what was learned from the experience [General Research Question 4] was less positive as only four of the seven respondents answered that question on the questionnaire and as follows:

1. We looked good as the Mad Hatter
2. Time will tell...
3. I am the Mad Hatter
4. Impressed by the technology

This limited response could be seen as born of the limits of learning anything from the experience. This was a much more experiential activity rather than a learning one. In fact, regarding Buxton 2007, this experience is best described as a sketching of a prototype given the very limited run with no time to reframe or reiterate the experience. It also points towards the need for further research that can explore the qualities of that activity. Furthermore, the other research questions, not included in the first practice project, should be addressed in the second practice project i.e.

Did they change anything? [General Research Question 3]
Did they leave with the content? [General Research Question 4]
What message/s did they take? [General Research Question 6]

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78 This compares with the alternative actions in Body Movies that still resulted in shadows formed i.e. the same form of content as expected by Lozano-Hemmer.
4.8 First Practice Project Reflection

The above questions require the creation of an installation that offers a means of **sustaining** existing and new content both in and beyond the responsive environment. The term “sustainability” draws on Floridi’s sense of environmental development and continued engagement with nature and technology and relates to Moore and Anderson’s concept of “productive”.

“Sustainable” as a term has a conventional meaning as something maintained at a consistent level and that that maintenance often has an ecological directive (Oxford Dictionaries 2015f). In this regard, sustainability accords with Floridi’s sense of environmental ethics as applied to the digital i.e., that one should endeavour to promote and construct good works with digital technologies, thus sustaining a positive “Infosphere” ecosystem. The first practice project used digital technologies in a discrete manner to draw users/visitors into the exhibition, into the mirror in fact. This is participation **in** something in more than one sense. The examples of “referee” mode regarding the content were outside of the remit of the installation but still inside the gallery space only. Yet digital technologies can offer networked possibilities that could connect and extend possibilities both in and outside of a responsive environment through an online “digital layer”. This should be part of the development of the second practice project.

4.9 Second Practice Project Development

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79 This was a point addressed in a talk given at the International Symposium on Electronic Arts in Vancouver, August 2015. The argument is that responsive environments can be created that sustain ideas beyond any indebtedness to a given practitioner (Richards 2015).

80 Yet, it is interesting to note that sustainability is not a term used by Floridi in his writings. This is due to a focus on individual development rather than in the complexities of communication between individuals, hence, the need to “socialise” Floridi’s approach with reference to Bishop.

81 This could be described as an online augmented reality layer.
Further to the gallery-based investigation at Dimbola the opportunity arose to take part in the Bestival Music Festival Science Tent from 4th – 7th September 2014. This location was apt because it provided a quantitative extension compared to Dimbola i.e. a move in terms of scale from a single room to an entire music festival site. Yet, the size was still manageable in that for the four days of the festival there was a “captive audience”. From that initial phrase developed the “Wild Things in Captivity” concept i.e. symbolic comparisons were drawn between the Bestival site and a safari park. For example, there was a fence around the site, many “animals” were contained within, on arrival they were tagged and during their stay they were offered “enrichment” to keep them happy. There were limits to this analogy. Indeed, one respondent stated that actually they felt much more free inside the Bestival site than outside it. However, from that analogy were spawned the five activities offered to the visitors to the Bestival Tent i.e. “Photo-safari”, “Species Tracking”, “Bioacoustic Recordings”, “Species Dispersal” and “Habitat Renewal”, see Figures 26 and 27 below. From the perspective of Bishop’s categories there was scope for “authorship” through the content collected, “activation” around the concepts, particularly “Habitat Renewal” and a sense of community built on Bestival as specific site. The hope was that, as shown on the posters below, a large amount of content would be “crowdsourced” and thus this would represent the Bestival in this new light (cf. Ooman and Aroyo 2011). This would be a new form of augmented reality as a digital layer of content overlaying the Bestival site through the Wild Things in Captivity activities.
Figure 29: The posters used for the Wild Things in Captivity project
A table was allocated within the Bestival Science Tent as part of the Southampton Solent University section. Posters, activity sheets, consent forms and information sheets were produced for the event.

There was a very positive sign up rate for the activities. However, it is the case that the outcomes from the project are as much critiques of the technology and administration of the project as they are the limited content supplied by respondents. In both cases, there is plenty to be learned from the first practice project.

Hypothesis: The Bestival music festival site provides a location for a responsive environment with an additional “safari park” layer applied, and offering rich possibilities for festivalgoers to be creative with the concepts supplied and for the resulting content to “go with them” via various network platforms.

This hypothesis addresses a number of related themes within the above research and extends the remit of the general research questions as follows:
1. Can an environment that is configured to offer roles ("agent", "reciprocator" and "referee" level) stimulate users/visitors both inside and outside of its remit?

This relates to Levin & Foster’s (2011) challenge to use QR codes i.e. tools can be used to create alternative output in a space defined by users.

2. Can an environment that is configured to offer positions ("agent", "reciprocator" and "referee" level) stimulate users/visitors both inside and outside of its remit?

This runs as a counterpoint to the use of the body of the user in a responsive environment e.g. Dekleva, et al, (2002) and Kortbek & Grønbæk (2008) i.e. respondents are required to be active participants in developing the activities and providing content.

3. Can repurposing opportunities arise when the content is open, i.e. allowing input from the user/visitor and, if so, what forms does that repurposing take?

This draws on opportunities to input content through a digital layer as part of the responsive environment (cf. Crofts 2012a and 2015).

4. What forms of learning experience are possible in a responsive environment?

That learning may be of a social form as expressed in relation to the Body Movies project (Lozano-Hemmer 2001).

5. How can a responsive environment use sound, visuals and presence to enable forms of enrichment?
The five activities, Photo-safari, Species Tracking, Bioacoustic Recordings, Species Dispersal and Habitat Renewal are configured to encourage the curation of sound, visuals and presence utilizing “crowdsourcing”.

6. What value and/or values are enabled in and through the responsive environment?

The activities Photo-safari, Species Tracking, Bioacoustic Recordings, Species Dispersal and Habitat Renewal, each relate to differing aspects of environmental awareness and values. In some cases, this is presented as abstract and even humorous. However, in the case of Habitat Renewal this is a practical activity that festival-goers can take a lead in.

The advantages of using this installation as the second practice project include:

a. This is on a larger scale than at Dimbola Lodge but still defined by the Bestival surrounding fence.
b. Online systems are in place that can be used to promote the project e.g. Bestival social media and others were produced.
c. The use of the Bestival Science Tent as a home for the second practice project means that there should be a good footfall towards the project.
d. There is a complementary shift from a literary subject matter to an environmental subject matter.

Convenience sampling, following Nick Emmel, was the technique used to gather the data i.e. those that entered the Bestival Science tent were invited to contribute (Emmel 2013). The content analysis of images approach, following Theo Van Leeuwen and Carey Jewitt in their *The Handbook of Visual Analysis*, was adopted (Van Leeuwen and Jewitt 2014).

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82 Ooman and Aroyo identify two criteria for successful co-curation: “(1) finding sufficient knowledgeable, and loyal users; (2) maintaining a reasonable level of quality.” (Ooman and Aroyo 2011, p.138)
The Platforms:
Wild Things in Captivity Facebook:
https://www.facebook.com/groups/835408959823798/

Wild Things in Captivity Twitter:
https://twitter.com/wildstthings

The goals for the second practice project:

1. To record and assess how the festivalgoers made use of the Wild Things in Captivity projects/concept.
2. To gain feedback on the construction, performance and practice of the Wild Things in Captivity projects/concept.
3. To record any examples of the Wild Things in Captivity projects/concept being repurposed.
4. To gain feedback in terms of how the Wild Things in Captivity projects/concept could be further developed.

The questions developed from the above exploration of specific principles are:
*What was their role? [General Research Question 1, 5]*
*What was their position? [General Research Question 2, 5]*
Did they change anything? [General Research Question 3]
*Did they learn anything? [General Research Question 4]*
*What did they make of the content? [General Research Question 3, 6]*
Did they leave with the content? [General Research Question 4]
*Did they repurpose the content? [General Research Question 4]*
*What message/s did they get? [General Research Question 6]*
What message/s did they take? [General Research Question 6]

For the first practice project the focus was on the questions with an *. This was due to the lack of opportunities to change the content or take the content away.
For the second practice project, there were opportunities for the festivalgoers to
change the content and leave with it. Indeed, the Species Dispersal project required them to complete the project only when they had returned home. This shift from the first practice project was towards a curatorial role for those who signed up to contribute i.e. that they could receive the content (used/made by others) or make their own content to be deposited in the online repositories: a “agent” mode. As this content was to be available online there were opportunities for responses through comments and other forms: a “reciprocator” mode. Although there were set rules (the activity sheets) for the project there were also opportunities to interpret those rules: A “referee” mode. This acceded with the forms of presence offered by Lombard and Ditton (1997). The approach of the project was the inter-mixing of the digital layer with the real space of the Bestival site. Hence, forms of presence 1 and 2 relate to the Bestival site drawing on its power as a cultural phenomenon. It is the case that form of presence 3 was present as the sign up to the Wild Things in Captivity concept was very high. However, the latter three forms, 4 - 6, were not evidenced, though prepared for through the online platforms.

4.10 The Evaluation Procedure

The evaluation of these contributions was to be in terms of content analysis and through the use of questionnaires aimed at those who contributed. In the event little content was submitted and the questionnaires were not used. See Appendix C for further documentation.

The group sign-ups to the five activities with the conversion rate in brackets:

- Photo Safari: 34 (0)
- Bioacoustic Recordings: 6 (0)
- Species Tracking: 9 (0)
- Species Dispersal: 9 (0)
Habitat Renewal: 97 (2)

Groups spoken to but with no sign-up: 9

Total sign ups: 130 (for one of or more activity) individuals (87 women, 43 men)
2 : 1 ratio women to men sign ups
Total groups spoken to: 139

Sign-up Conversion rate: 1 : 65

As can be seen from the above statistics the conversion rate in terms of sign-up was good, indicating a general desire to take on an “agent” mode in the project. A ratio of 130 : 9 was achieved with regard to signing up for one or more of the activities. However, both in the sense of absolute and relative responses, the conversion rate regarding the completion of the activities were either poor or very poor. Overall, the ratio was 1 : 65 for completion of activities. Indeed, only Habitat Renewal gained any completions with Photo Safari, Bioacoustic Recordings, Species Tracking and Species Dispersal gaining no completions. It is immediately clear from these results that the system for encouraging completion was inadequate. Furthermore, with only two completions in all there were not enough respondents to warrant questionnaire use. First practice project responses were not large in number but at least indications of interesting phenomena were observed. In the case of the second practice project the emphasis must be predominantly on the critiquing of the construction both technically and in terms of “human factors” i.e. there is a need to assess the design of similar projects in order to considerably increase the conversion rate in terms of delivery of content.

Benford and Giannachi’s use of The Five Layers of Time is useful here in terms of assessing the relationships between the setting up of the project and its
completion (2011 p.96). As previously stated there was minimum time between
the acceptance of the project and the need for its delivery at Bestival i.e. the
scripting of the Author Mode and Director mode had to be completed very
quickly. The “story time” for the activities was within the period of the Bestival
or just after but dependent upon how long the respondents wanted to take for
the activities. Indeed, the Habitat Renewal activity required input from the
respondents at the moment of their departure and the Species Dispersal activity
required motivation after the end of the festival with a tracking back to the
home location. The plot time coincided with the story time thus predominantly
making the respondents also the directors of their own content creation/
delivery. Therefore, this was a form of asynchronous interaction with regard to
the setting of the activities and their completion with the only limitation on time
being within or at the end of the Bestival. The scheduling was dependent upon
when a set of respondents accepted an activity. This meant that depending upon
when an activity was taken up the group/individual may have four, three, two or
one day to complete the task if Photo Safari, Bioacoustic Recording or Species
Tracking. Conversely they would have one, two, three or four days to remember
to complete their Habitat Renewal or Species Dispersal task on leaving the
Bestival site. From the above it is clear that there were issues regarding the
interaction time that were built into the structure of the project. There were a
range of tasks to perform before the project repositories could be interacted
with. That latter process was itself simple in that content captured was to be
uploaded to the Wild Things in Captivity platform. However in this case the
hidden factor was the interactions by the respondents with the content of the
Bestival. The completion of the tasks was affected by the engagement with all
the other stimulus of a music festival.\footnote{Bestival is known for its alternative approach to content and consequently there is plenty
to divert the festival-goers: “Bestival has a reputation for making space for the odd and eccentric, and as such it’s usually rewarding if you ditch any plans and just take a wander across site and see where this takes you” (eFestivals 2015).} Suggestions for how to deal with these
diversions are supplied in section 3.11.2 and 3.11.3 below. The small amount of
content produced did not encourage a *perceived time* i.e. the apprehension of content by other participants and thus the possibility of additional responses/content. Thus the asynchronous activity of the few respondents was not followed up by further synchronous/asynchronous interactions both others.

Benford and Giannachi offer a further format of use here regarding the roles available. They offer the roles of performers, spectators and orchestrators to describe mixed reality projects (2011, p.176). This fits the Wild Things in Captivity project in that there are required performances with scripts to work to. From this perspective the respondents are to be both performers (completing the activities) and spectators (of the content) with the orchestration of the project “front loaded” through presentations to the respondents about the various activities and the supplied activity sheets. This reapplication of Benford and Giannachi’s roles indicates that respondents are being enabled to take the *lead* in the process. Equally this format shows that the linear form of the project requires orchestration *throughout*, precisely because of the asynchronous requirements of the activities. It is also the case that Moore and Anderson’s offer a wider range of roles (patient, agent, reciprocator and referee) that could relate to different forms protagonist behaviour. For example, agent better describes the role of a respondent as a curator/uploader of Wild Things in Captivity content than performer or orchestrator.\(^{84}\)

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\(^{84}\) Noting that Benford and Giannachi’s definition of orchestrator here is people who facilitate others to participate in the project (2011, p.176).
Above are the three pictures sent in under the Habitat Renewal category that constitute all the submissions. Even with these three images there are points of interest. The picture on the left illustrates both the clearance of the respondent’s tents but also the remains of the tents left behind. The middle picture somewhat resembles a paw print on the grass. These show some completions in the “agent” mode. This is “presence” represented as absence. The picture on the right is supplied with some humour with the space cleared all but for one of the campers. The continued presence of a person teases that notion of habitat renewal. This shows a playing with the rules in “referee” mode. However, these pictures only offer a tantalising taste of the content that could have been submitted. There were no comments into the system i.e. in “reciprocator” mode. Furthermore, Photo-Safari, Species Tracking, Bioacoustic Recordings and Species Dispersal delivered no content at all and it is in the latter activities that the richer forms of presence, 4 - 6, were to be supported.

Even though very little content was submitted there were examples that related to Bishop’s categories of “authorship” as in this was the purpose of the project, “activation” as in two groups had cleared their camp sites and “renewed their habitat”. However, the lack of content and therefore the lack of commentary around that content meant that any sense of “community” gained was negligible.
4.11 General Findings from the Second Practice Project

It is clear that the experiences of second practice project show the value of pursuing the development of prototypes. This practice project has not been a complete disaster. Effectively the practice project worked to 50% of its aims i.e. respondents signed up in significant proportions to do the activities: “agent” mode. However, apart from very limited expressions of an “agent” and “referee” mode in submissions, that was the limit of the success. Put succinctly the problems for the practice project were threefold (incorporating the “Practical Issues” DECIDE category):

4.11.1. The Technical Problems

Problem: The hope was that the lack of 3G signal could be alleviated by the purchase of a Mobile Router. However, this router was only as good as the 3G signal coming into what is a fairly deep valley. Research completed before the event seemed to show that a 3G signal was available at the location of the Science Tent, see Figure 29 below (EE Coverage 2015; Bestival Map 2015).

Figure 32: An overlay created showing a lozenge of 3G signal over the Bestival Science tent (mixing a overlay of the 3G signals with the Bestival map).
However, in fact, the signal was too weak to enable uploads. Indeed, 30,000 people accessing the same network in such a small space is likely to cause signal loss; on Friday evening it was not even possible to send a txt.

Solution: Develop a project *not* dependent on localised Wi-Fi or 3G/4G networks. N.B. This does not mean that a project cannot be launched or run in a defined location but that the area must be in the available footprint or that content gathered can be uploaded “off site” if need be.

4.11.2 The Administration Problems

Problem: Although it is tempting to blame the technology for the lack of content delivered by respondents it is the case that all content could have been sent once they had returned home. In addition there is the issue of the respondents being diverted from their activities either by the general stimulus of Bestival or, on leaving, the understandable urge to get underway.

Solution: In all these cases there could have been additional stimuli to encourage completion of the activities e.g.

a. A related competition
b. Specific reminders via email or social media
c. Stickers or other tangible *aide-memoires* to encourage completion

All of these suggestions would have required additional administration. However, the approach of getting consent forms signed and the supplying of activity forms alone was obviously insufficient. Pledges were made, a positive to a point but they were in retrospect too abstract given the specifics of the environment.
4.11.3 The Human Factors Problem

Problem: It is clear that there was value in the representation of Bestival as safari park. The vast majority of those spoken to in the tent got that analogy. However, the extrapolation of that analogy into five separate projects was with hindsight too large a collection. Only Habitat Renewal and Photo-Safari achieved viable numbers: 34 (24%) and 97 (70%) respectively. This was the case of over-indulgence in the aspects of the safari-park motif. Furthermore, the reliance on respondents simply taking pictures with their phone would have minimised the “hassle factor”, indeed, the human factors involved. The other activities required the use of microphones to record sound and the downloading of GPS tracking apps. These were interesting activities, with attendant ecological philosophies, but in the context of the Bestival site, they were overly complicated, resulting in poor take up and zero completion.

Solution: One or two activities should be offered. In this way the power/focus of the philosophy can be maintained and the call on human factors is kept to a minimum.

In conclusion, the other research questions, not included in the first practice project, and not addressed to any satisfaction in the second practice project are:

What message/s did they take?
Did they change anything?
Did they leave with the content?

It is also important to note that there was an inadequate appreciation of the following in the design of the project: “[T]hat the rewards in the learner’s [or festivalgoers] activities must be intrinsic or inherent in the activity itself.” (Moore and Anderson 1969, p.575). This is partly addressed in critique above. However, the point still needs to be made explicitly and should be part of whatever is developed for the third practice project.
4.12 Second Practice Project Reflection

Although the outcomes of the practice project were sparse, the conclusion was drawn that a reframing was required to move to a concept of a responsive environment supported and informed by a digital social layer. This was for three reasons:

1. The digital social layer of networked content contained on social media platforms enables both the sustainability of that content not possible in a gallery setting alone and that those same platforms can be used to gather data as the forms of responses developed in both real spaces and online. Furthermore, if configured to good effect such system should be able to support “authorship”, “activation” and a “community” thus exploring Bishop’s criteria.

2. The examination of the possibilities of a digital social layer as part of a responsive environment is a contribution to the area of study because no such assessment has thus far been made.

3. Whereas the first practical project had an artistic/perceptual focus and the second practical project had a scientific/ecological focus both with a procedure of data gathering through statistics and questionnaires, on reflection this lead to the position that the development of the third practical project should be socially/community focused (cf. Bishop above) through a project at once in the mode of a stand-alone piece in the sense that the content was created in situ. Indeed the siting of a concept is a key part of an RE. This may be compared with Benford and Giannachi’s notion of trajectories used to explore a number of Blast Theory’s projects and the journeys that participants take through their projects. It is not that REs cannot have trajectories and MRs cannot have sitings but rather
that it is a question of imperative. Siting is a central purpose of an RE. This may be compared with trajectories as described by Blast Theory’s Matt Adams:

The role of trajectories is a very important part of how we think about our work. One of the thing Ju and I do is relentlessly put ourselves in the role of the participants and drive through the work in a chronological way taking multiple and different trajectories through it. (Benford and Giannachi 2011, p.205)

It is important at this point to emphasise that trajectories are distinct from the notion of the five layers of time or Benford and Giannachi’s use of performer, spectator and orchestrator in that the latter two can be used to critique a range of projects including RE (as applied above). However it is possible to create REs whose experience is based around the sitting, for example, Billy Klüver et al’s “The Pavilion” was experiential in form, there were no overt narratives installed in the building: it was a tool that others could use to a variety of ends. This encouraged forms of protagonists behaviour enhanced by the siting of The Pavilion.

Therefore the creation of an RE that combines siting and a tool concept, utilising a digital social layer could produce a strong imperative for respondent involvement with particular attention being paid to a reassessment of Benford and Giannachi’s use of Five Layers of Time in this context with a view of promoting asynchronous and synchronous interactions. Chapter Four documents and critiques this approach.
5.0 Chapter Five
The Third Practice Project and the Developing Theoretical Framework

5.1 A Historical Contextualisation of the Concept of a Digital Social Layer

The first practice project followed a conventional, discrete, gallery-based approach to the development of a responsive environment (cf. Peterson 1991 and Kortbek and Grønbæk 2008). The second practice project, though involving a social media component to display content, is fundamentally focused around the gathering of closely constrained content in relation to a finite area (cf. Croft 2012b). However, it was during the development of the second practice project that the possibility of a responsive environment taking a qualitatively different turn came to mind, i.e. that that environment could be driven through the digital social layer but with reference to a specific location. This formulation was, in part, in reaction to the concept of “the Internet of things” (Greengard 2015) whereby real world objects are given an Internet presence through RFID chips (Greengard 2015 p. 15) or other means. If the “the Internet of things” was extended to become “the Internet of social things” the form of link from real world to digital world could not be a RFID chip. It would need to be of a symbolic form to enable a multiplicity of representations of the social. In this regard, Nina Simon, following Jyri Engeström, has posited “social objects” as means by which networks are successful (Simon 2010, p.130). Engeström: “The fallacy is to think that social networks are just made up of people. They’re not; social networks consist of people who are connected by a shared

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85 “RFID” meaning “radio frequency identification”, a small device that can be sensed to enable the location of an object or person to be tracked (Technovelgy 2015).

86 This is the original meaning of Post Digital as coined by Russell Davies: “Post Digital was supposed to be the next exciting phase... It’s the bit where the Digital people start to engage in the world beyond the screen...” (Davies 2010).
object” (Engeström 2005). That object could be a social thing that connects people through common experiences. This could sustain the communal nature of the social rather than isolating things separately identified. These shared social objects would have a digital presence additional to those forms identified by Lombard and Ditton. To avoid these digital social objects becoming free-floating there must be reference to a real space.

Howard Rheingold made this point in his book The Virtual Community (1993) in the first major analysis of “The Net” as supporting the social. Indeed, “virtual community” was a misnomer as the WELL (Whole Earth ‘lectronic Link) community featured in the book met “F2F”, face-to-face, “IRL”, in real life. Consequently, for people living in the San Franciscan Bay area, the online WELL community was a digital layer complementing the real social space. The extent of that real social space was in terms of the geographic coverage of the people in that community. Furthermore, the WELL social/cultural space existed before Internet, again indicating that the digital layer was an enhancement rather than a replacement for or initiator of that community. As Rheingold (1993 p.2) put it:

The WELL felt like an authentic community to me from the start because it was grounded in my everyday physical world. WELLites who don’t live within driving distance of the San Francisco Bay area are constrained in their ability to participate in the local networks of face-to-face acquaintances.

This expresses both the physical world origin of the community but also the fact that those who joined the WELL from remote locations could be involved in discussions and other online activities yet were unable to contribute to the F2F component of the WELL. This latter aspect enables a wider reaching network

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87 Engeström is drawing on Actor-Network Theory in that the “shared object” can be a person or a concept etc (Latour 2005). He is also using “object” in the sense of a target or purpose. This notion works with Simon’s concept of a “participatory museum” filled with “social objects” i.e. artifacts brought to life through social associations (Simon 2010).

88 The Whole Earth Catalogue had been in existence from 1968 as a counterculture magazine. The WELL was based at the same offices in Sausalito from its inception (Rheingold (1993 p.39).
informing and enriching the WELL community from afar. This equates with the notion of a responsive environment *enriched* by a local and/or global digital social layer as compared with an RE enabled by an embedded digital layer *in situ* (cf. Dekleva et al 2002 or the first practice project above). Thus, a digital social layer referring back to a specific social/geographical space offers complementary content/interactions to that space: a responsive environment that supports two-way responses that can be sustained through social media platforms. This is an example of “the internet of social things”.

These points go some way to justifying this extension to the concept of responsive environments. However, as this is a key contribution to the area of study it is important to provide a more detailed and contextualised justification for this approach.

In 1983, Benedict Anderson published *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. This highly influential book sought to show that the invention of print had enabled the communication of a sense of nationalism and the nation state in ways impossible before.\(^{89}\) However, Anderson moved on from the conventional argument that printed books then newspapers enabled the spread of ideas to look at the mechanisms within the content of these new media that contributed to a wider social consciousness. Anderson put forward the concept of the “meanwhile” drawing on Walter Benjamin’s concept of “homogenous empty time” (Benjamin 1940) i.e. that the modern world was built on a sense of simultaneity. Print, through multiple publications, made it possible to see multiple perspectives on a nation. Furthermore, in both novels and newspapers multiple perspectives could be represented in the same written space i.e. the protagonists in the plot/news story play out different imaginings of their community at the same time. In fact, Anderson argued that it was only through such imaginings that the populace could know their nation: “It is

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\(^{89}\) As a case in point, *Imagined Communities* has been cited more than 62,000 times (Google Scholar 2015a).
imagined because the members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them, yet in the minds of each lives the image of their communion” (1983 p.15).

It is interesting to compare this analysis with the experiences of the WELL community who, in many cases, did know each other directly. However, through the medium of the Internet and the written word they were able to learn more, often intimate, information about their colleagues, and their bonds were strengthened because of it but always with the reference back to the social/geographical space. In fact, given the slow speeds of the Internet in the early 1990s text was the default medium. This early form of the Internet based on the newsgroups and fora enabled two-way communication and text-based creativity. The arrival of the first browsers shifted the attention to static web pages. Yet, Netscape 2.0 browser (1995) and Tim Berners-Lee’s “Amaya” browser (1996) also included the ability to edit pages online. However, the former also enabled graphics and plug-ins and thus expansion possibilities in the direction of commerce leading to the Internet as an entertainment/shopping system e.g. Amazon and eBay both began in 1995. They and others have helped to define the notion of isolated online consumption and the move away from shopping as a social and public activity. It is also the case that isolated screen-based “Net Art” produced by individuals was the norm then. Indeed the experiences leading into this research project were concurrent as stand-alone screen-based art and online screen-based art, the latter form being championed from 1998 to this day by Rhizome.org Arts Community (Rhizome 2015).

It was Manuel Castells, in a major study of the Internet as one aspect of The Rise of the Network Society (1996), who sought to analyse and define these individualising experiences. It is significant that Castells proposed the concept of “Timeless Time” (Castells 1996, p. 460) to describe the simultaneity of activities
enabled by digital networks. \(^90\) “Timeless time” maps to Anderson’s concept of “meanwhile” offering a continuity of ideas in terms of first print and now digital media i.e. that the range of the “meanwhile” is extended considerably online. \(^91\) This could be seen as a positive move to greater social awareness through a multiplicity of “meanwhiles”, but this was also the time of “personalisation” whereby online systems enabled content to be filtered and customised to individual requirements. \(^92\) This conception compares markedly with Bentley et al’s use of the term “personalisation” which relates to a form of personal creativity built on other layers supporting a democratic understanding of a space and Moore and Anderson’s concept of “personalisation” as supporting “responsiveness” and “reflexivity”. Online personalisation involved the isolation of the needs of a user and the feeding of those needs in isolation. Castells’ characterisation: “Our societies are increasingly structured around a bipolar opposition between the Net and the self” (1996 p. 3). Yet, for all that “bipolar opposition” Castells still explores the concept of virtual communities and Rheingold’s experiences in the same book. However, only in terms of whether an online, virtual community can be seen as a community at all (Castells 1996, p. 386). This shifts the focus from the origins of the WELL in a real space to a conceptual question as to the significance of online communities per se and thus to the individual and remote immersion in those online communities. Online communities that referenced real social/geographical spaces were still in existence, including the WELL, but the shift in focus towards individual consumption became prevalent through the early 2000s.

However, the reinvention of the social online came with the development of web applications that enabled sophisticated interactions. This has been defined as the moment of Web 2.0 (O’Reilly 2005) and expressed by the first of such web

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\(^{90}\) Judy Wajcman, in Pressed for Time: The Acceleration of Life in Digital Capitalism, also draws on this concept (Wajcman 2015).

\(^{91}\) Castells does not reference Anderson regarding the concept of “timeless time”.

\(^{92}\) See Keeble and Macredie 1998, for a positive contemporary reading of online “personalisation” and see Neilsen 1998, for a more critical contemporary reading.
applications e.g. Gmail (April 1\textsuperscript{st} 2004) YouTube (February 14\textsuperscript{th} 2005) and Facebook (live to the public September 26\textsuperscript{th} 2006). From an artist’s perspective from the late 1990s to the mid-2000s the development of laptops with sufficient power meant that digital artworks could become transportable and complex, temporary installations and performances could be developed.\textsuperscript{93} In addition, there was the development of dedicated software from this time to facilitate such activities.\textsuperscript{94} This combination led to a move into real spaces e.g. clubs, theatres and galleries, the rise of the role of the “VJ” or video DJ being indicative of this development (Faulkner 2006). This was, in part, as a reaction to the creative limitations online at that time.

However, it was smart phones (Apple iPhone from 2007) and then tablets (Apple iPad from 2010) that shifted the online social and the “meanwhile” to a qualitatively different level.\textsuperscript{95} Castells has charted these developments and consequently complexified the network society concept to now include a large proportion of the world’s population as active nodes in that network.\textsuperscript{96} Furthermore, this led to Castells’ reassessment of the relationships between various forms of network (2015 p.249):

[Social movements] are networked in multiple forms. The use of the Internet and mobile communications is essential, but the networking form is multi-modal. It includes social networks online and offline, as well as pre-existing social networks and networks formed during the actions of the movement.

\textsuperscript{93} This is the \textit{modus operandi} of the KikiT VisuoSonic Research Group:

\textsuperscript{94} Software utilised at this time included: Adobe’s Director, interactive application builder (Adobe 2015); Cycling 74’s Max MSP, installation software (Cycling 74 2015); Processing, open source installation software specifically created for visuals artists (Processing 2015); Pure Data, open source installation software (Pure Data 2015) and Troikatronix’s Isadora dance installation software (Troikatronix 2015).

\textsuperscript{95} This is equally made up of the hardware technology in the pocket and the apps contained within it, hence, the focus for the first practice project. The small profile of a tablet and the power of an app for face detection fitted the requirements of the exhibition.

\textsuperscript{96} Castells 2004 and 2015.
This reassessment has come from Castells’ study of major social/political movements around the world including contributions to “The Arab Spring”. However, this could equally have been based on the myriad of local community groups who enhance real world sociability with a digital social layer and was there in the WELL community over 20 years ago. This is a move on from an imagined community relying on the reading of novels, newspapers and other one-to-many publishing systems to opportunities to contribute to those imaginings in and through social media forms and with reference to real spaces: examples of “the internet of social things”.

An exemplar for such contributions was City Strata, an iPhone app (Crofts 2012b) enabling different app layers to be created within it. Dr. Charlotte Crofts, project designer, Calvium, an app development company and Peter Insole, website designer, collaborated to create the “Cinemap” app from 2012. The app enabled users, based in Bristol, to learn about the once large number of cinemas in the area through documents and verbal testimonies. As the user moved through the streets the stories unfolded. City Strata’s “Cinemap” app was, therefore, a digital layer enhancing geographical and social spaces of Bristol using the concept of “cinema(m)apping” (Crofts 2012d). Furthermore, users could upload their own stories of cinema going into the same digital layer and then “geo-located” to where cinemas once were. The second practice project drew on the earlier work of Crofts i.e. Curzon Memories App in terms of the ability for users to comment on the content but only outside of the app itself in a Twitter feed. Furthermore, the second practice project closely constrained the forms of content to be supplied: there was no call to bring other user-originated content into the system. City Strata’s “Cinemap” took the ability to input

97 It may seem trite to compare the major political movements across several Middle Eastern countries with local community groups but the principle is the same: a digital social layer enhancing a real space. The success or failure of that enhancement has to be analysed specifically, this being Castells’ task in the case of “The Arab Spring”.

98 “Geo-located” as in tagged using a GPS (Global Position System) signal to specific spatial coordinates.
content to a qualitatively different level i.e. *inside* the app enriching the content there. Applying Bishop’s criteria to City Strata there were opportunities for authorship into the system. There was a communal space created attached to specific locations. This relates to Lombard and Ditton’s forms of presence 5 and 6, i.e. an environment with opportunities of engaging with people represented in that environment. As to activation, specific initiatives were investigated relating to the saving of cinemas in the Bristol area in danger of demolition e.g. Whiteladies Picture House (Crofts 2012c). The communal nature of this digital layer enhancing a real space is highly significant and of considerable influence on the third practice project. In this research project’s terms protagonists can contribute content (as memories of cinema-going experiences) into their own digitally enhanced environment through a digital social layer. This is also an example of the Internet of social things.

However, there is the need for caution regarding the communal nature of such technologies because the key social media apps were and are configured around the individual user in the first instance, e.g. Facebook, Twitter and latterly Instagram. Indeed, these systems privilege individualisation, in terms of social interaction but also commercialisation in terms of news and other media through “friends”, “likes” or “follows”. Astra Taylor expresses this in *The People’s Platform: Taking Back Power and Culture in the Digital Age* (2014). The book is a sustained analysis of the commercialisation of the web, the gathering of consumer data and control by big business. She concludes (2014 p. 232):

> Our communication system is at a crossroads, one way leading to an increase in corporatized and commercialized world where we are treated

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99 The documentation for the City Strata project is extensive. However, this does not include any examples of input from users. It seems that the project stalled in early 2013 at prototype level. This does not diminish the creative scope or the value in influencing the third practice project.

100 The second practice project sought to take on this isolation by offering a means to gather content based on various social/biological concepts into a communal collection (albeit that they were individually gathered).
as targeted consumers, the other to a true cultural commons where we are nurtured as citizens and creators.

Taylor is a documentary filmmaker and is concerned with her, and other’s rights over their own content. Taylor’s stance is in response to a feeling of isolation caused by being individuals targeted as consumers rather than being social enabled as producers. She also cites many examples where content is exploited online through illegal copying and distribution. Her call is for policies to protect and support *individual* artistic and, in the terms of the present research, protagonist activity.

Tiziana Terranova, provides a further warning with regards to such communal or individual protagonist activities through her examination of the concept of “free labor” (Terranova 2003). Terranova, and more recently Trebor Schultz (Schultz 2012), critique the neo-liberal assumptions of an open and free Internet pointing to the many forms of exploitation of workers in “digital sweatshops” and the assumption that all content produced online should be free to the user. Terranova references Rheingold and the WELL as an example of how the online used to work before its commercialisation (Terranova 2003):

Free labor, however, is not necessarily exploited labor. Within the early virtual communities, we are told, labor was really free: the labor of building a community was not compensated by great financial rewards (it was therefore “free,” unpaid), but it was also willingly conceded in exchange for the pleasures of communication and exchange (it was therefore “free,” pleasurable, not imposed).

For Terranova and Schultz this early equal exchange has been superseded by the selling of ourselves (Schultz 2012, p.2):

The social web appears to be free for us to use, but there are hefty social costs; oligarchs capture and financialize our productive expression and take flight with our data. We the “users” are sold as the product.
This research project’s call is for real world communities enhanced by a digital social layer, following the WELL community approach. This does not stop the selling of our data but it does challenge what has become a very individualistic web.

As explored in section 3.7.3 above Locative Media systems such as Foursquare have shown that the “spatial self” can be supported between digital platforms and real spaces. This is a social “spatial self” as the content on such systems can influence, entertain, annoy, and stimulate contact with, others. All social media should be that i.e. that Facebook, Instagram and Twitter should be repurposed to help people reimagine real social spaces rather than be isolated from them.  

But where should this be and what form should this take?

Furthermore the two forms of synchronous (situation) and asynchronous (exhibition) interaction, cf. Hogan 2010, are apt here as they acknowledge differing forms of orientation with regard to the content. Thus it can be argued that in the context of RE the sitting of people and content in a locale more aptly expresses the process than the concept of “trajectories” as offered by (Benford and Giannachi 2011, p.205). This is also to draw a distinction between projects built around an unfolding game/narrative format and REs that offer experiential opportunities with tools and sites. This is not to criticise the former but rather to argue that REs have an imperative to be sited as a key part of their make up and as a specific form of Mixed Reality whereas projects with narrative trajectories are concerned with journeys conceptual and/or real. What is to be sited and what it means to be sited are key components that should be drivers

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101 At time of writing Instagram is removing “Instagram maps” a means of viewing other people’s photographs taken in terms of their location. This further isolates the user in terms of their locations only (The Verge 2016).

102 This is not to say that REs cannot contain narrative formats. Krueger’s projected use of REs to inculcate information to students would have worked in this way but is actually a qualitatively different extension of his original premise of experimenting with musicians. Again this may be described as the difference between functional and mutual forms of interaction.
for the development of REs. However, as seen above Benford and Giannachi’s use of The Five Layers of Time, that aptly fits with a narrative format, can be used in the context of REs. It is then a question as to which of the layers are sited in the RE i.e. could not only the participant interaction and perception forms of time but also protagonist activity through author, director and scheduler modes of time be present there. This coincidence of times could be facilitated through the creation of tools that enable protagonist opportunities through further authoring, direction, scheduling, interaction and perception. It is in this spirit that the third practice project was begun.

5.2 The Third Practice Project Documentation

Representations of the Isle of Wight have been of a sustained interest. The first two practice projects reference such an interest on an increasing scale. The concept for the third practice project came from a wish to represent the Isle of Wight as a social space as a whole as a resource for people to show their connection to that space. This aspiration was in response to the following reflection:

The Isle of Wight struggles to have any identity of its own. All water, electricity, gas, most media, Police administration etc. are imported. There is little of Isle of Wight language left. Even the distinctive “DL” registration plate for all Island cars has now been removed, replaced with HW (for Hampshire area). What defines an Islander? Answer: The Island shape itself (seen on house number plates, car aerials and so on). The #LoveWight project is designed to offer people from or on the Isle of Wight an opportunity to be creative with that shape.

103 This first found public expression in a final major project for a Cultural Studies degree that then become part of the local history archive at Portsmouth Library (Richards 1987).
104 “During the Twentieth century the county prefix “DL” was an important element in the identity of the Isle of Wight” (Chessell 2014 p.4)
105 Justification originally supplied as part of the Ethical Review Document for the #LoveWight project.
The form of that resource grew out of a reflection on existing hand signals used on the web and other media. For example, Mo Farah (“M”), Figure 34, and Gareth Bale (“Heart”), Figure 35, use such signs.

![Mo Farah making the “M” sign. Picture Credit: http://static.guim.co.uk/sysimages/Sport/Pix/pictures/2012/7/12/1342119439602/Mo-Farah-celebrates-winni-008.jpg](http://static.guim.co.uk/sysimages/Sport/Pix/pictures/2012/7/12/1342119439602/Mo-Farah-celebrates-winni-008.jpg)


However, these signs are either used to identify an individual or to show “love” towards individuals or their fans. Could there be a hand signal that represented a place? Furthermore, could that hand signal act as a tool to enable those using it to show a connection to that place? This reflection quickly moved to trying out hand signals that represent the shape of the Isle of Wight.\(^{106}\) The chosen sign, Figure 31 below, is a diamond shape which references the use of the phrase “The Diamond Isle” in relation to the Isle of Wight and in November 2014 the project

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\(^{106}\) Further details of this process are supplied in Appendix D below.
was named #TheDiamondIsle and provisional platforms on Facebook and Twitter were created for it.  

Two modes were proposed in terms of the use of the hand signals:

1. The hand signal in shot across the body of the user either on the Isle of Wight or “abroad”.
2. A shot taken through the diamond shape featuring a place on the Isle of Wight or “abroad”.

![Figure 35: The Diamond sign.](image)

Further to the first and second practice projects the success of the project would be in terms of the range of content created and the forms of extension and repurposing of that content. The #DiamondIsle project was configured around a very simple rule: Take a picture using the #DiamondIsle hand signal and show your connection to the Isle of Wight as an expression of a “spatial self”. The hope was that the simplicity of this tool would encourage engagement with the idea and also a variety of means in extending or repurposing it. A plan B of using #LoveWight instead was banked in case the first idea was unsuitable.

As this was a project that sought to positively represent the Isle of Wight the possibility of collaborating with the Isle of Wight Tourist Board was investigated. In November 2014, a meeting was arranged with a member of the Visit Isle of Wight, the Destination Management Organisation (DMO) for the Isle of Wight, to

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107 For example, tourism companies use the phrase. (cf. Visit England 2015)
explore the possibilities of the hand signal either being used by them or that they would agree to retweet/repost content produced. The rationale for this collaboration was that any activity would be of a non-exclusive form i.e. copyright would be retained over the idea but the Visit Isle of Wight could use any content for publicity purposes. Furthermore, any content submitted by the public would also be non-exclusive i.e. the latter could use it for their own ends. This meant that all parties could create and/or keep any content. Thus, the bonus of support from the DMO, with their reach both on the Isle of Wight and beyond, could benefit the project but not limit its potential. The Isle of Wight Tourism conference was attended in January 2015 at which a number of speakers, including David Thornton, CEO of Visit Isle of Wight, emphasised the need for engagement with potential and actual tourists through social media and specifically the use of pictures to tell stories. The primary outcome from this conference was that collaboration was a possibility. The original intention for the duration of the #TheDiamondIsle project was March to September 2015. However, it took a considerable time to arrange a meeting with David Thornton and his Digital Content Manager (DCM). During preliminary emails Thornton said that they had no plans to use the “diamond isle” motif so the back up concept of #LoveWight was used as the title of the project. This meant the hand signals developed from the “diamond” sign to the “love” and “Wight” sign together, see Figure 37. In addition, the hashtag #LoveWight was adopted for the project together with “#Love the...” as a means of giving more information about the form of that “love”.

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108 Visit Isle of Wight had over 25,000 likes on their Facebook Page. (Visit Isle of Wight Facebook 2015)
The argument was put to Thornton that there was an opportunity to enable the people of the island to become part of the strategy in promoting the Isle of Wight and, furthermore, those visiting the island could also contribute to that publicity. This accorded with research conducted into the work of Barbara Neuhofer, Dimitrios Buhalis and Adele Ladkin, who, in “Conceptualising technology enhanced destination experiences” made the following observation (2012 p. 43):

As destinations [DMOs] can only create prerequisites for an experience, they need to facilitate a space that is attractive and compelling and allows for valuable experiences to be created. This space should constitute an interactive forum for multiple players, with the tourism consumer as the focal point of the experience, who co-creates with tourism suppliers and co-consumes the experience, value and space in the specific context of the destination.\footnote{This “co-creation” could be seen as participating in the tourist experience. It may also be the work of protagonists directing experiences through, e.g. good, bad or indifferent Tripadvisor reviews (Tripadvisor 2016).}

The paper also included Figure 38 below as a graphical representation of this quotation. It is a statement of fact that such technologies provide a digital social layer to the tourist location (Neuhofer, Buhalis and Ladkin 2012, p. 40).
The paper was sent to Thornton as a further justification for the collaboration. The meeting took place on 19th May 2015.

The meeting resulted in the following points:

1. Visit Isle of Wight did find the #LoveWight project interesting. Thornton said that they had been investigating hand signs of that type.
2. Thornton said he could see the hand sign taking off if enough content could be created.
3. He said that he could see the sign being used for publicity purposes and Isle of Wight related merchandise, for example, posters and T-shirts.
4. The DCM suggested that Facebook and Instagram were used as the platforms, which was agreed. The original intention was to use Twitter, however, Instagram was suggested because of its appeal to younger people.
The outcome was very positive and the hope was for an active collaboration between the parties. The decision was made to launch the #LoveWight project at the Isle of Wight Festival in early June 2015. However, the DCM was in the process of leaving so no use was made of the content created at the Festival. The DCM left during July 2015 and the replacement took time to bed in. This was then followed by the move of the company from Osbourne House to Council buildings in Newport taking nearly a month to organise. It was not until August 21st that the new DCM was contacted whereupon they stated that content would be reposted etc. “if it was of sufficient quality”. They also stated that a Twitter account be made to tie-in with the Visit Isle of Wight offer. However, such a late inclusion of the platform was a severe challenge and, compared to the other platforms, very little interaction took place. This was further compounded because the DCM’s commitment was not followed by any “liking” or “following” of #LoveWight platforms and all attempts at posting content to or referencing the company through hashtags produced no response. After the Bestival in early September, the decision was made to run the project to November 1st 2015 to take in the autumn half-term holiday enabling potential contact with “VFRs” i.e. “Visiting Friends and Relations”. This group are, despite the large influx of young people for festivals, a major part of the yearly visitors to the island. Furthermore, they are often islanders themselves and may be keen to show a connection back to the island before traveling. Although additional content was created through the period, Visit Isle of Wight did not repost any of it. Just five days after the #LoveWight project was wound down on 1st November the local Isle of Wight County Press carried the story that the Isle of Wight Council had decided to no longer fund the Visit Isle of Wight company to the tune of £330,000 (Anon 2015). At the time of writing the future of Visit Isle of Wight is in doubt.

110 The Isle of Wight Festival began on June 10th so the whole project had to be reconfigured around #LoveWight including the platforms and identity in three weeks.

111 The Visit Isle of Wight statistics show that 24% of all visitors to the Island during summer 2015 were VFRs (Visit Isle of Wight Statistics 2015).
More positively after the run of the project the Visit Isle of Wight Instagram account has gone onto to use the #LoveWight hashtag (Visit Isle of Wight 2016).

In short, the proposed collaboration with Visit Isle of Wight was not successful in terms of promoting the #LoveWight project. This lack of activity can be explained in terms of external factors. However, the process of developing the collaboration had enhanced the #LoveWight project in terms of the academic research background relating to tourism and “co-creation” and in terms of targeting the youth and the VFRs through festivals and the autumn half-term. A considerable amount of content was gathered this set back.

The #LoveWight project was devised to enable contributors both on and off the Isle of Wight to show their connection to the Island through the use of the “love” and “Wight” hand signals. This digital content referred back to the island both symbolically in terms of the hand signals and through the use of hashtags or pictures taken at a location on the Island. Those who are “off-Island” could show a connection back to the Island by using the signs wherever they were presently.

The Platforms:
https://www.facebook.com/lovewight2015
https://www.instagram.com/love_wight
https://twitter.com/LoveWight2015/

Hypothesis: The two renowned Island Festivals (Isle of Wight Festival and Bestival) plus the autumn half-term week offer opportunities to create content for the #LoveWight project gathered either from face-to-face encounters with respondents or online through the #LoveWight platforms. This can then contribute to a digital social layer over the Isle of Wight and will test the concept in situ.
This hypothesis addressed related themes from the above research further explored in the questions below and not further condensed for the purposes of questionnaires etc. as with the first two practice projects, as they were explored through content analysis in the social media platforms as unique and sustained contributions to the concept of responsive environments:

1. Can an environment that is configured to offer roles ("agent", "reciprocator" and "referee" level) stimulate users/visitors both inside and outside of its remit?

The #LoveWight project offered roles to users/visitors relationships with the Isle of Wight as a responsive environment through tools as symbolic representations and possibly the first example of this approach.

2. Can an environment that is configured to offer positions ("agent", "reciprocator" and "referee" level) stimulate users/visitors both inside and outside of its remit?

The #LoveWight project offered positions to users/visitors relationships with the Isle of Wight as a responsive environment through tools as symbolic representations and possibly the first example of this approach.

3. Can repurposing opportunities arise when the content is supplied as symbolic tools, i.e. allowing input from the user/visitor and, if so, what forms does that repurposing take?

The #LoveWight project offered these opportunities in social media platforms, as a digital social layer, relating to the concept of responsive environments.

4. What forms of learning experience are possible in a responsive environment?
In the #LoveWight project these learning opportunities were offered in terms of the symbolic tools supplied and their further use/promulgation by others through the social media platforms.

5. How can a responsive environment use sound, visuals and presence to enable forms of enrichment?

The responsive environment relied upon input from users/visitors for that enrichment. It is their presence with regard to the Isle of Wight that enriches that environment.

6. What value and/or values are enabled in and through the responsive environment?

The general value of the #LoveWight project is to offer means of connection to the island for those both on and off-island through a symbol that seeks to express an identity of and with the Isle of Wight.

The use of the digital social layer enables the content to move out beyond the specific location and offers opportunities for the content to be reused and repurposed in ways not possible in a location-locked responsive environment. This reflects the online presence of the WELL community i.e. based in a specific area but informed by content from, and informing users beyond that area. This relates to the work of Schwartz and Halegoua (2015) and their concept the “spatial self” (see section 3.7.3 above). This also relates to the forms of presence offered by Lombard and Ditton (1997) because the #LoveWight hand signs can connect back to the Isle of Wight as a presence (presence as transportation) as well as people representing aspects of the Isle of Wight by being present on it (presence as immersion). The presentation of the Isle of Wight through the #LoveWight concept is pitched as welcoming (hence, “love” “Wight”). There is symbolic representation of a “spatial self” but always with
reference to the real space (presence as realism via the #LoveWight symbolism). There are opportunities to interact with the environment either as a user/visitor who is on or off the Isle of Wight showing a connection back to the island through a representation of it (in shot) or literally through the #LoveWight hand sign capturing either a view abroad or on the Isle of Wight. The format of Facebook and Instagram enables the interaction, through comments, likes and posts with those others in the platform constituting a social form of presence.

5.3 The Evaluation Procedure

The DECIDE system (Rogers, Sharp & Preece 2011, p.456) was used to evaluate the effectiveness of the practice project i.e. Determine the goals, Explore the questions, Choose the evaluation methods, Identify the practical issues, Decide how to deal with the ethical issues. Evaluate, analyse, interpret, and present the data.

Further to the small-scale gallery-based first practice project and the Bestival-wide second practice project this third practice project was for festival-goers and island visitors or people abroad wishing to show a connection to the Isle of Wight.

Online systems could be used to promote the project e.g. the Isle of Wight Festival social media and Bestival social media. This together with an agreement, leading up to Bestival, from Visit Isle of Wight (the Isle of Wight Destination Management Organisation) to repost content offered opportunities for “real-time” dissemination of the idea. The use of the Kashmir Café at the Isle of Wight Festival and the Science Tent at Bestival supported good footfall. The use of festivals on the Isle of Wight gave a demographic of visitors to the Island and Islanders too.
Convenience sampling, following Nick Emmel, was used to gather the data i.e. those that were at the Kashmir tent or who entered the Bestival tent were asked to contribute (Emmel 2013). For further details on the information supplied on these occasions see Appendix D. The content analysis of images approach, following Theo Van Leeuwen was adopted (Van Leeuwen 2014) with particular focus on his use of “iconological symbolism” meaning the use of signs to indicate biographical information, in this case in terms of respondents relationships with the Isle of Wight.

The advantages of an online strategy around the Autumn Half-Term Holiday, in addition to activity at the two d=festivals included, included:

1. The holidaying of returning or new visitors to the Isle of Wight with school-age children.
2. Islanders returning to the island at a good time to meet up with relations with school-age children.
3. These initiatives coincided with Visit Isle of Wight promotions at this time.

A range of additional content was made to stimulate interest and activity:

1. Pictures on the island in sample locations featuring people in shot, including Carisbrooke Castle and Tennyson Down.
2. Pictures using the island shape as a frame including Compton Bay and Puerto Pollensa, Majorca.
3. Pictures featuring meals had at island cafes and restaurants including Langley's of Cowes and Seafood Corner of Newport.
4. Backgrounds, icons and other identities for the Facebook, Instagram and Twitter platforms.
5. Promotional stills and video featuring the #LoveWight signs in various forms, locations and types. The original intention was to collaborate with Paul Windridge, an independent filmmaker, in the creation of a promotion video shot
at the Isle of Wight Festival. Times constraints meant that Paul could not be involved in the project but he did supply the music for the video.

6. Pictures taken of objects e.g. stones and food that look like the Isle of Wight reinforcing the shape of the island as a reference.

The goals of the #LoveWight project:

1. To record and assess how the festivalgoers and online contributors responded to the #LoveWight project.
2. To gain feedback on the construction, performance and practice of the #LoveWight project.
3. To record any examples of the #LoveWight project being repurposed.
4. To gain feedback in terms of how the #LoveWight project could be further developed.

The #LoveWight project statistics represent both the sign ups and the conversion rate because the content was gathered there and then.

The Isle of Wight Festival:

Total number of groups spoken to: 10
Total number of groups contributing to the #LoveWight project: 9
Conversion rate: 9 : 1
Total number of people involved: 21 (12 women, 9 men)
4 : 3 ration women to men sign ups

Bestival:

Total number of groups/individuals spoken to: 120
Total number of groups contributing to the #LoveWight project: 115
Conversion rate: 23 : 1
Total number of people involved: 280 (187 women, 83 men)
2.25 : 1 ratio women to men sign ups

The number of standard #LoveWight signs are compared with others:
Isle of Wight Festival: non-standard 3 / standard 9 - ratio 1 : 3
Bestival: non-standard 24 / standard 115 - ratio 1 : 4.8
Figure 34 below shows the standard form.

![Figure 38: The standard form of “love” and “Wight” signs](image)

Other submitted content:
Sent in content across Twitter, Facebook and Instagram: 10
Standard forms of #LoveWight: 8
Non-standard forms of #LoveWight: 2 (Figures 74 and 79)
The total number of people submitting content to #LoveWight: 310
Total “Likes” on Facebook #LoveWight page (at time of writing): 136
Sample of 85 likes show 50 women and 35 men liking #LoveWight Facebook

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112 Facebook restricts the number of likes that can be seen from the page. Hence only 85 likes can be assessed out of the 136. (Facebook Like Restriction 2016).
Comments that directly addressed the #LoveWight project are recorded:

“Yeah, great idea” and variations on.
“I’d love to be involved” and variations on.
“What is the point of it?” Two such questions.
“What is the research question? One such question.

There were three occasions when further information was sought about the project. In these cases satisfactory answers were given and they each contributed to the project. The vast majority of the responses were very positive. Of the five groups/individuals who rejected the offer two said they did not want their photograph taken. The other three just said “No” or “No thanks”.

For the autumn half term a composite image was created of examples taken by people “off island” with the accompanying hashtag #Getmebackthere (one of the hashtags offered at Bestival). The initiative did not generate new content. However, the composite photograph received the most “likes” of any image on the #LoveWight Facebook and Instagram i.e. 17, see Figure 36 below.

Figure 39: Composite photograph produced for the Autumn half-term
Isle of Wight Festival examples of adaptation of the #LoveWight signs are recorded:

Figure 40: A theme of using the Isle of Wight sign as a visor to look through.

Figure 41: The Isle of Wight sign used as a partial mask for the face.

Figure 42: The Isle of Wight sign used as a partial mask or moustache.
These show the use of the signs, in some cases in the standard form (6 examples) but also in terms of some biographical input (cf van Leeuwan 2014) through the use of masks, visors or moustaches (3 examples). The significance of these additions could be in terms of a wish to be mysterious or to hide behind the signs, equally these attitudes can be described as simple acts of creativity and extensions to the idea when asked to perform a task with a presented tool. There was some variation in the Isle of Wight Festival offerings but not to the same extent as in the Bestival respondents. Where it is tempting to say that greater imagination was shown at the Bestival site being a more experimental festival (eFestivals 2015) equally this may just be due to the far fewer respondents accessed in the first festival.

The Bestival examples of adaptation of the #LoveWight signs are recorded:

Figure 43: The Isle of Wight sign be a frame for, in this case, a giraffe.

Figure 44: A couple forming the combined love and Wight signs. The woman did not want to be in shot but wanted to contribute. This was their solution.
Figure 45: Two Isle of Wight signs used to look through and a heart to hide behind.

Figure 46: An Isle of Wight sign to look through.

Figure 47: A heart sign formed by the two women and the man the island.
Figure 48: A straightforward heart and island but with an unusual facial expression.

Figure 49: The most complex set of hand signals produced. The group also suggested shooting outside.

Figure 50: An intimate method of lining up the love and heart signs together.
Figure 51: Another intimate pose. This couple followed on from the previous one and, therefore, they may have seen the move and copied it.

Figure 52: The elbow of the woman nestling in the arm of the man.

Figure 53: The use of both signs as visors to look through and with one person above the other.
Figure 54: An intricate linking connecting the two signs.

Figure 55: The joint creation of the signs between two people.

Figure 56: The elbow of the woman nestling in the arm of the other.
Figure 57: A couple forming the love and Wight signs together.

Figure 58: The woman strikes a pose with the island sign.

Figure 59: Two people both partially hiding their faces with the signs.
Figure 60: The two women in the visor pose with the men using a more standard mode.

Figure 61: Two people in standard mode with one person striking a pose with the sign.

Figure 62: One person striking a pose and the other person partially hidden.
Figure 63: A new way of presenting the signs. The man spontaneously said, “Let’s go large with this!” and they presented the #Lovewight signs as whole body signs rather than the hand signs. This is an example of a group taking a “referee” approach and in fact *reinterpreting* the rules.

Figure 64: Three standard forms and one use of a visor mode for the island sign.

There were a range of adaptations applied to the #LoveWight signs at both the Isle of Wight Festival and Bestival. These broke down into the following forms:

1. Hiding one’s face with either hand signal.
2. Looking through either hand signal.
3. Showing another object through one of the hand signals.
4. Forming the shapes by looping around another person’s body with variations on that.
5. Making the signs by joining up hands with other people with variations on that.
6. Making a “funny face”.
7. Nestling an elbow into another person’s arm.
8. Striking a pose with the island hand signal.
9. Forming the shapes out of arms instead of with hands.
All groups (115) who signed up to contribute to the #LoveWight project adopted the “agent” role in that they actively contributed to the digital social layer, most with related hashtags, see pages 160 and 161, as well as the #LoveWight signs. Of those groups a significant number (24) showed that they were aware of the rules and played with them: “referee” mode. One group rewrote the rules for the #LoveWight signs using arms instead of hands for the signs: an advanced “referee” role.

From the perspective of van Leeuwan’s iconological symbolism a range of biographical components were present. The brief to show a connection to the Isle of Wight was extended to show a connection between the members of the group by interlocking of arms, nestling arms in each other, the striking of group poses or individual poses, the incorporation of hugs for a close friend, as well as masks and visors created. These adaptations referenced the affection stimulated by the #LoveWight concept. This affection was further represented by the hashtags chosen by the groups, see the Isle of Wight Tag Data below. Both the tag data and the images created enabled a representation of the “spatial self” (Schwartz and Halegoua 2015) relative to the Isle of Wight as a symbolic tool and a real space. This relationship was enabled synchronously as each picture taken at the festivals was uploaded immediately.

In addition, individuals or companies/commercial concerns connected with the content either immediately or over the period of the festival in an asynchronous manner.

The examples of company/commercial links to #LoveWight content are recorded:

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113 These adaptations show a richness in the respondent use of these hand signs as compared with Mo Farah’s or Gareth Bale’s more constrained actions and interactions. It should be noted that Figure 43 does include a positioning similar to Bale’s but there are many other uses supplied too.
Figure 65: A further alternative approach to the signs with an intimate connection. It also shows “wightvisitor”, the online blog review site for places to eat and drink on the Isle of Wight, connecting to images in reciprocator mode. In addition “richardmorrismusic” is a singer-songwriter promoting himself through Instagram through “liking” the picture.

Figure 66: A further intimate version of the love and Wight signs. It also shows WightlinkFerry, the Island Ferry Company, using the image as promotion for ferry sales for next year’s Bestival showing a reciprocator mode and also referring forward to their own website making a new connection.
Figure 67: Another further reciprocation being made by Wightlink Ferries.

Figure 68: Additional companies connecting to the #LoveWight project. ConcertFlask a company selling pliable plastic flasks to sneak drink into clubs and festivals and GetonBloc, a promotional site for Bloc, an Android and Apple App for discovering events at clubs and festivals, connecting to the project.
The forms of interaction from companies and commercial concerns were either in “reciprocator” mode by adding their name to the page with a “like” e.g. “richardmorrismusic” in Figure 62, or in advanced “referee” mode making new rules for the use of the content as promotional material e.g. “WightLink” and their “#wightlive” competition. This is an additional form of presence in the sense of commercial connections made outside the #LoveWight project.
These inputs were not immediate but made within the compass of the festival thus still with currency. These appropriations of the concept were examples of how the #LoveWight signs could have developed into a meme stimulating further synchronous and asynchronous activity. In addition a number of friends of the groups featured tagged or liked the content in a particular picture. At the time of the festival two hashtags and twelve @ tags were associated with the pictures as means of making connections and sending on the pictures to others, see Isle of Wight Festival Tag Data below for details. Again these reciprocator connections could have supported a continuance of the #LoveWight concept beyond the project. That this was not the case could have been down to timing or simply the economy of scale required to get a such a tool to go mainstream. It is important to state that there were examples of the content embedding into the people who had not been persuaded to be involved i.e. this shifted the focus from simple involvement in a research project to a place in the development of a “spatial self” relative the place and in relations to others responding to that association.114

The examples of content sent directly to the social media platforms are recorded:

Figure 71: A submitted picture to Facebook of Priory Bay, Isle of Wight, using the island framing approach. The framing has the horizon running along the middle so that it features both the sky and the beach - hashtag supplied: #PrioryBay.

114 This recalls Swartz and Halegoua's point regarding the capabilities of social media to enable more “...“organic” circumstances than via directed research studies” (Schwartz and Halegoua 2015, p.6).
Figure 72: A newly graduated Islander at Oxford submitted to Facebook. In this the outside of the frame is as important as the inside.

Figure 73: Lamma Island in Hong Kong. This is obviously a “photoshopped” image submitted to Facebook. There is a clear black line around the hand. However, someone living there sent this. Furthermore, the hand shapes come from a picture previously posted by #LoveWight showing how to do the island sign (See Figure 71 below). In addition, the “twinning” with the Isle of Wight is also a product of Photoshop.

Figure 74: The #LoveWight sign.
Figure 75: A picture taken on the Brazilian/Argentinian border of the Iguacu Falls submitted to Facebook. The silhouetting produces a powerful image that is interesting both in and outside the island frame.

Figure 76: Considerable invention shown re. the island sign, submitted to Facebook, to capture both a boat and one of the Solent forts in shot at the same time.

Figure 77: Yet another way of nestling one arm into another, in this case for both parties to hide behind the signs. Taken at the Isle of Wight Festival and submitted to Facebook.
Figure 78: A standard form of the signs, taken in Stroud submitted to Facebook.

Figure 79: A picture taken by the blogger “WightVisitor” featuring Calbourne Mill and receiving 12 likes on Instagram. Of interest is that the hand is in focus rather than the place.

Figure 80: A picture taken by “thegreatleveller” and submitted to Instagram in almost the same place i.e. Compton Bay, as one of the first pictures taken as part of the promotion of the project but at a different time of day. – see Figure 82 below.
The content submitted directly to the #LoveWight platforms shows an agent mode in contributing but also reciprocator mode e.g. paying homage to the content already in the project i.e. the Lamma Island picture incorporating the original #LoveWight sign and “thegreatleveller” reproducing the original #LoveWight picture of Compton Bay. Furthermore, Figure 83 creates a new rule, in referee mode for the #LoveWight sign extending the concept to “I love Wight”.

Figure 81: A picture taken for the promotion of #LoveWight

Figure 82: A particularly ingenious use of buildings and greenery in Kuala Lumpur, Malaysia to “spell out” “I love Wight”. Submitted by direct entry to Twitter.
These examples, together with the others above give strong indications of a “spatial self” at work, perhaps more so than the festival shots that were stimulated by the researcher i.e. this content was self-generated with only the online guidelines to follow and supplied in a voluntary manner without any persuasion. Furthermore, following van Leeuwan (2014) these images contain biographical information either in terms of showing a relationship between people or places or celebrating a particular event, a shared connection to a town or in the latter case showing love for the Isle of Wight through the iconography of Kuala Lumpur. The outcomes clearly show different forms of creativity applied, they are overtly connected to a place, the person is either in shot or supplies descriptions/hashtags so as to make connection with that place and humour is sometimes employed to further the connection (e.g. the photoshopping of the Isle of Wight as twinned with Lamma Island). These pictures show evidence of responses to a local environment (if not on the island) and/or of a response to the Isle of Wight through the #LoveWight hand sign as tool. Furthermore, even though the #LoveWight tool is simple in design these examples show that it can be used in many creative ways: differing expressions of a spatial self supplied in an asynchronous response to and through this digital social layer supported RE as the Isle of Wight.
Isle of Wight Festival Tag Data

#thereal_djhammy
#LovetheBeaches - gi
#LovetheQuiet - c
#LovetheFestival - poi
#LovetheMusic - gi
#LovetheFriends - gi
#LovetheFestival - poi
#LovetheMusic - gi
#LovetheFestival - poi
#LoveWight - - poi
#LovetheCountrySide - gi

All respondents contributed. One example “DJ Hammy” of a hashtag used to connect out to his wider network.

Bestival Tag Data

#allieverdoissin
#shannonmareejenkins
@beaahutchinson
@_sophiemgray
@ronanfinnegan
@emmahoward7
@oliveressex
@flobellinger
@em.noakes
@hridgeley
@rosieblackaller
@caitlin123scott
@jess__reid
@ruthpunzel

Fourteen examples of tags used to connect the content from #LoveWight out into the users wider networks. In some cases specific people were tagged so that they would see the content e.g. @caitlin123scott. In other cases @ tags were used so that the content would connect with their own networks e.g. @rosieblackaller.
Following Saldana (2014) a coding scheme was developed to draw out relevant information about the data set of hashtags. In the first cycle coding three codes were identified within which all the hashtags could be placed i.e. Places of Interest; General Interests and Concepts. A wide range of hashtags were used from the very specific, regarding a places of interest (poi: 37), through more general interests (gi: 44) to concepts (c: 62). These codes express a continuum from a specific locale through to an affliction for an activity and the statement of an abstract idea. As part of this first cycle of coding “pattern coding” was used, requiring more than one instance of a code, to draw out recurrent themes in the data i.e.

Code: Places of Interest:
The Festival; Bestival; Ferry; Isle of Wight; Garlic farm

Code: General Interest:
Sea; Weather; Sun; Hills; Music; Beaches; Sailing

Code: Concepts:
Diversity; Science; Summer of Love; Glitter; Atmosphere; Friends; Bio Festival; Everything

This form of coding tends to bring out the conventional themes from the data. The places of interest apart from the Garlic Farm are within the perspective of festival goers coming to a specific place on the Isle of Wight. The Garlic Farm is five minutes by car from the site and the nearest tourist spot. Therefore, its mention is not surprising. The general interest instances also conform to expectations in terms of the standard attractions of the Isle of Wight. However, it terms of concepts expressed there is both a focus on aspects of festival, including direct references to Bestival (the tag for that year was “Summer of Love” and the instances of “science” relate to the occupation of the science tent). The references to Bio Festival are intriguing as they do not relate to the
Bestival or connect with other festivals that year. However, the trends of “diversity” and “everything” extend the scope further. They point to a need to dig deeper into what “everything” could mean in this context. Therefore the first cycle of coding was followed by a second cycle (Saldana 2014, p. 233) in this case using a Domain and Taxonomic coding (Saldana 2014, p. 181) which is aimed at understanding “folk terms” from an ethnographic perspective. Coding in this case is in terms of domains of “cultural knowledge” containing key words as a taxonomy relating to that domain. This form of coding would be familiar to Giddens’s in his microethnographic study of terms used by his children that were transducted from screen to real life (Giddens 2014). Importantly the researcher can develop their own analytical terms as this is a form of cultural analysis.

Domain: Tourist Attractions

Named:

Bestival; Bestival; Blackgang Chine; Red Squirrels; Garlic Farm; Needles; Ferry; Shanklin; Robin hill; Monkey Haven; The Pointer (Island Pub); Dinosaur Fossils

These attractions are, again, standard in form. The Garlic Farm, Monkey Haven and The Pointer are all within close proximity of the Bestival or Festival sites. However, others are further afield but all conventional with regard to the way the Isle of Wight is promoted.

General:

beaches; quiet; countryside; weather; sea; people; vibes; sun; sunshine; green; seaside; nature; sunset views; hills; beach; sailing; cleanliness; chilled; pretty; atmosphere; picturesque; natural; friendly; polite people; colours; new friends

It is also the case that the more general references to the Isle of Wight are conventional in form. However, a number are positive in terms of representing
the island and these were used as part of the half-term holiday promotion for #LoveWight in both associated text posts and a video.

Domain: Self Promotion

#thereal_djhammy #allieverdoissin
#shannonmareejenkins
@beaahutchinson @_sophiemgray @ronanfinnegan @emmahoward7 @oliveressex @flobellinger @em.noakes @hridgeley @rosieblackaller @caitlin123scott @jess___reid @ruthpunzel

Other Mentions:

#Loveswim2Bestival #sFinnegan #borg #LovetheSunflowers #BioFestival, #Sciroom #Danny #Anslemklint

There was an amount of self-promotion through the images supplied both through hashtags which make a general connection to a person and @ tags that forward on the content to that persons account. @rosieblackaller is a singer song writer with nearly 20,000 followers on Instagram. An @ tag applied at the time from her picture connected her picture to those followers. @emmahoward7 tag was used by a friend to show that they had later seen the picture through Instagram, see Figure 83.
Figure 83: A friend of the people in the picture using an @ tag to make a connection back to person in the picture at a later time.

These are examples of both synchronous and asynchronous interactions with the content connected to the Isle of Wight and through the #LoveWight hand signs. There were also mentions made of other people and entities. The “sunflowers” hashtag relates to a local charity. “Sciroom” is a group operating out of Southampton University and were present in the Science Tent. Other people were mentioned because they were friends and the connection to them was being sought.

Domain: Emotive Aspects of the Isle of Wight

#lovetheextralove #Utopia #lovethechildhoodmemories, #lovewightforretirement #smellslikeheaven #loverymyhome (islander), #Lovetheatmosphere #getmebackthere,
The forms express both emotional attachments to the island and various sentiments regarding “home”, childhood memories, a wish to get back and place to retire. These sentiments were used in #Lovewight promotional material in advance of the Autumn half-term to support subtle connections between islanders living “off island” and a return to the island on a break. The tag #getmebackthere was used as a strapline.\textsuperscript{115}

Domian: External Connections

#Biofestival #DuranDuran #Grime #Actionbronson #NewScientist #ChemicalBrothers

There were some examples of hashtags aimed at bands and other entities. Biofestival gained two calls. “New Scientist” was mentioned by the editor of the online arm of the magazine who was present. And three bands and one genre were mentioned again linking out and back to these artists as fans of those bands, that genre. These were positive connections in terms of the promotion of the project and also indicators of how personal content can be quickly allied to public entities such as bands and cultural forms. Thus the “spatial self” (Schwartz and Halegoua 2015) is connected both to the specific location through the tagging and the image and to objects of their interest at the same location. This is a sophisticated example of Schwartz and Halegoua (2015, p.6) following Hogan (2010) of “…synchronous “situations” and artefacts that take place in asynchronous “exhibitions.” In the latter case this is a means of exhibiting the content created and commented on synchronously to a related fan base and members of an admired band to encourage further asynchronous interactions.

The hashtags supplied strongly feature the two festivals. However, there are a considerable number of other places of interest mentioned, plus general interests and concepts that relate either to the festivals or the island as a whole.

\textsuperscript{115} There is scope for using this hashtag corpus as stimulus for a follow up project relating to the Isle of Wight.
This indicates links that could have been made with Visit Isle of Wight initiatives but none were taken.

The take-up rate for #LoveWight at the festivals was very good and also enthusiastic. The standard adoption of the #LoveWight signs was similar in both cases, although the necessitated small number of examples at the Isle of Wight Festival does not carry as much weight as the Bestival corpus. Furthermore, there is a greater degree of variety and creativity shown in the larger number of contributions at Bestival. It is the case that the original rules of #LoveWight are extended and, in some cases repurposed, by respondents across agent, reciprocator and referee modes.

Some of the content supplied to the social media platforms directly conforms to the hand signs as supplied. However, there are a number of examples where the hand signs have been reinterpreted, played with and repurposed as different representations. For example, the submission from Malaysia spells out “I love Wight”, Figure 79, and the picture taken in the Solent connects sailing, a fort and the sea, Figure 73. Furthermore, the “WightVisitor” Instagram picture re-orientates the focus to the hands and not the place. This is a qualified success in terms of the original desire to see if protagonist behaviour would arise.

5.4 General Findings from the Third Practice Project

It is clear from the evidence supplied that the concept of #LoveWight has been taken up at both of the festivals and beyond. The take up rate has been high in both cases. Furthermore, the premise that even simple rules and a simple tool can lead to extension, adaptation and repurposing does have value. These expressions are both local to the pictures taken and after the fact through the use of likes, @ tags and referrals. The #LoveWight concept is seen to have intrinsic value both to those in-shot and in terms of their extended audiences.
There is evidence that an extension of the concept of “spatial self” is at work through links to both the place of the Isle of Wight, to friends and to wider connections either conceptual to local to the space i.e. bands (in this case) in the locale.

In comparison, there has been little use of the #LoveWight signs outside of the requests for content across all platforms. All the examples are supplied above. The final phase of the project sought to attract content from friends, relations and others who are off-Island and thus can only be approached remotely and, furthermore, can deliver content from abroad. This was not successful but this was reliant on reposting of content by Visit Isle of Wight and this did not happen. There have been previous examples submitted from across the world. However, they have been few in number. So whereas there has been some authoring of content, there has been little activation or community development in Bishop’s terms. The connections have been socially one-dimensional back into the networks of the respondents through hashtags or @ tags but not extended beyond that.

More positively, in the variety of outputs from the festivals and other sources, there are reinterpretations of hand signs and there is a mix of liking an existing picture, the use of the picture to connect with others and the making of a new use of that picture for other ends. Furthermore, these representations relate to a variety of forms of presence made possible through the project, both in direct relation to the real space of the Isle of Wight and through symbolic relations. In some cases, the repurposing is in terms of a picture is placed in another context, e.g. Figure 63 above used by WightLInk Ferries to promote next year’s sailings for Bestival. This is the same content given a presence in a different context. In this regard, there has been a mix of both participant and protagonist activity both in the #LoveWight project and beyond it. Returning to forms of interactivity it is possible to state that a supplemental mode of interactivity is present in these activities (Rafaeli & Sudweeks 1997). However, at time of writing, it is less clear
whether Pask’s concept of “mutualism” is present. There is some evidence to state that a form of mutualism is at work between the real space of the Isle of Wight with its symbolic representation through the #LoveWight content in the digital social layer. However, further critical reflection, incorporating the concept of the “spatial self” and synchronous and asynchronous interactions, is required to understand the forms and significance of this.

5.5 Critical Reflection on the Third Practice Project

The #LoveWight project had been constructed to examine how a digital social layer could enhance a real world space through symbolic connection in terms of signs. The forms of response were both towards the island as a real space and also within the digital layer only. In the later case some of the repurposing of the content was to support promotional activities of either a personal or company form. It is the case that the systems available in Facebook, Instagram and Twitter are configured to support this form of repurposing. This led to reflection on the notion of a responsive environment that was only a social media platform. Could there be such a thing? This resulted in a reconsideration of Pask’s notion of “mutualism” through the specific categories he supplied to describe a second-order cybernetic system i.e. a “…catalyst, crutch, memory and arbiter” (1969 p. 496). The Facebook algorithms do support the role of catalyst as posts are promoted, advertisements inserted and other initiatives taken including, for example, automatic calls to honour someone’s birthday. Facebook offers support services both personal and group in nature. Self-help groups and personal help through comments is a common part of the system. The Facebook timeline becomes a diary/memory bank for an individual/group. And Facebook makes decisions in terms of what is viewed e.g. deferring back to “Top Posts” even if the user chooses “Most Recent Posts”. Furthermore, during the #LoveWight project the Facebook Page was promoted using the “boost” system whereby a certain amount of money paid means that one’s content reaches a certain amount of people. Facebook decides who is actually reached with nominal
control given to the promoter. In short, people might think that they join Facebook to converse with other people but they are also conversing with Facebook itself.

Therefore, this thought experiment appears to indicate some value in the assertion: Facebook as a responsive environment. This would, it seems, be the logical outcome of starting in a real space (Dimbola Lodge), moving to an digitally enhanced location (Bestival) then to real space symbolically represented in the digital social layer (Isle of Wight) to a free-floating digital layer with the attributes of a responsive environment (Social Media Platform). This apparent finding drew the focus back into Pask’s research into conversation theory and cybernetics and resulted in the discovery of the Pangaro Paskian archive (Pangaro 2015). This is an archive maintained by Paul Pangaro, Associate Professor at the College for Creative Studies, Detroit, who had worked with Pask in the 1970s and took on the task of making Pask’s papers and books available online because they were out of print. A survey of this archive led to the discovery that, in 1975, Pask had collaborated with Nicholas Negroponte on a book entitled *Soft Architecture Machines* (Negroponte 1975). This was a publication of the Architecture Machine Group (later Media Lab) at MIT. Pask was invited to introduce the book. Pask’s introduction, “Aspects of Machine Intelligence”, became an opportunity to work through cybernetic theories in graphical form leading to a description of how a computer system could converse with humans and out of that conversation an environment could be built, stimulated, adapted and maintained; this would be evidence of machine intelligence (Pask 1975b). Figure 84 below shows the drawing of that system: an architecture machine, Drawing 9. It should be noted that the sequence of drawings 1 - 9 represented a very dense web of ideas in development. For the sake of brevity, the key

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116 The lack of currently available papers and books by Pask is somewhat surprising given the plaudits handed out regarding his contribution to cybernetics and beyond, for example, a glowing review of Pask’s work on the Cybernetic Society’s website (Scott 2011).

117 Negroponte was originally intending to convert Pask’s drawings into graphics but on seeing them he decided to include them in *Soft Architecture Machines.*
themes of the design are described and it is recommended that the reader follow the full argument up until this point in the original introduction.\footnote{Paul Pangaro supplies an accessible introduction to drawings 9 and 10 in a video for his “Pask Archive”: Pangaro 2001, from 5’ 45”.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{drawing9.png}
\caption{“Drawing 9”, the architecture machine.}
\end{figure}
The designer of the system is represented on the left of the central vertical line. The central line and two circles represent the interface between the designer and computer. This interface is made up of concepts and content relevant to the project through which the designer and computer communicate. The top left and top right quadrants relate to the concepts held. The bottom left and bottom right quadrants relate to the use of concepts. Importantly, in this iteration there is concept sharing at work. That is, either the designer or the computer shares what the concept is or how to use that concept. As can be seen there are cybernetic loops connecting selective components together, for example, a designer can communicate a new concept to the computer (horizontal left to right movement) or a computer can communicate how to use a concept to a designer (horizontal right to left movement), Figures 84 and 85. These processes can learn from and inform the interface between them. This information can then inform an environment or be informed by that environment, represented as
There is a learning process at work in the sharing of existing information:

* Sharing a concept - as participants
* Sharing the use of a concept - as participants

The term “participants” is applied i.e. participating in the existing framework, obtaining or using the existing content. But can this be applied to the practical projects of the present research?

The installation at Dimbola Lodge taught the visitor the concept by being in front of the mirror. This is also the case with the “installation” at Bestival where the concept of, specifically, “habitat renewal” was reproduced. How to use the #LoveWight concept signs was learned by over 300 people and employed to reproduce those signs. These activities conform to this process as conversations between people and computers with respect to a specific and real environment.

Drawing 9 was what Negroponte asked of Pask, relating machine intelligence to an environment, but the latter went further and sought to represent in a drawing, Figure 86 below, what he termed “prerequisites for creativity and innovative activity”, Drawing 10 (1975b p.29).

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119 In the box, Pask refers to “Gerbil Blocks” which had been a Machine Group installation for the “Software: Information Technology: Its new meaning for art” exhibition 1970/1971 in New York (Burnham 1970). The installation was a conversation between gerbils and a computer with both moving blocks around in a cage.
Figure 86: Drawing 10, the “prerequisites for creativity and innovative activity” (Pask 1975b p.29).
Although Pask does not offer an example of this in action, “concept production” (Fernandez, 2008 p.65) it is an example of “cybernetic mutualism”. Indeed, many of his practical projects conformed with this aspiration including the Musicolour Machine with its ability to respond to musicians and offer new content to them and those musicians, in conversation with the machine, would make new content. It is important to note that Drawing 10 builds on Drawing 9. The additional theme is that a concept or the use of a concept supplied by one party can result in the making of new concepts or new uses of concepts by another party. The diagonal lines, linking “concepts” to “how to use concepts”, represents this possibility, see Figure 87.

Figure 87: A schematic of Drawing 10, cybernetic mutualism.

120 Dragana Čebzan Antić used this term in her 2012 PhD thesis entitled “Modes of Interaction in Computational Architecture”, Goldsmiths (Antić 2012). However, though Antić quotes from Pask’s Architecture Review article re. “mutualism” and other articles in Negroponte’s Soft Machine Architecture, she does not refer to Pask’s introduction containing Drawings 9 and 10.

121 A further discovery in the Pangaro archive was that Pangaro and Usman Haque had worked together and had both had produced texts referencing Drawing 10. Haque’s has twice included the drawing but not referenced the Soft Architecture Machines origin or attempted to work through its implications (Haque 2008; 2016). Thus his most detailed analysis is that of “multi-loop interaction” and “the ability of each system, while interacting, to have access to and to modify each other’s goals” (Haque 2008, p.103) referenced on page 36 above. In comparison, Pangaro has abstracted out the conversational element in a figure of eight loop and applied it to commercial contexts regarding the development and marketing of products and services (cf. Pangaro 2010).
parties may be people or people and computers or computers only, as signified by $\alpha$ and $\beta$. This can be expressed as:

* Sharing the use of a concept to make a new concept - as protagonists
* Sharing a concept to make a new use of a concept - as protagonists

The application of “protagonists” in this context indicates a qualitatively different activity requiring the making of new material and thus moving into different relationships with content. But can this be applied to the practical projects of the present research?

At Dimbola Lodge there was a majority who conformed to reproduce what was asked of them i.e. to stand in front of a mirror but there were also indicators of the visitors making new concepts out of the experience either in playing with the characters, or stopping or attempting to grow characters in unusual places.

At Bestival there was one instance of habitat renewal as requested but also an instance of one submission where a new concept was made i.e. the joke: as if a person had been left behind.

For the #LoveWight project there were a majority of people who reproduced the love and Wight signs as supplied. However, there were examples of new ideas around those signs both in terms of using them for other ends (as masks, e.g. Figures 46, 47, and 51 or as a means to link people together, Figures 50, 55 and 56 and making new content from them, Figure 77: Solent picture and Figure 83: “I love Wight” above or reinterpreting them, even to the extent of redesigning and thus making a new form of the #LoveWight sign itself i.e. Figure 64. Furthermore, there were examples of those images being used to make new

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122 This may be compared with Turing Test (1950) that “only” sought to create a computer that could converse in text as if human. Indeed, at the beginning of the introduction Pask states “…Turing’s Game and my conversation are not identical and the interested reader may profitably compare the two and, in some respects, contrast them” (1975b p.8). This was the most polite way of inferring the latter is more sophisticated.
concepts around promotion, e.g. Figures 67, 68, 70, above, where WightLink Ferries used the photographs for promotional purposes, and other purposes witness the twelve @ tags and two hashtags used by people in the photographs to share their picture outside of the #LoveWight Instagram, see Bestival Tag Data section above. Therefore there is a match with Pask’s analysis but how does that relate to the original focus on Moore and Anderson’s modes?

<table>
<thead>
<tr>
<th>Moore and Anderson’s modes</th>
<th>Relationships with content</th>
<th>Pask’s analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Obtaining content</td>
<td>Pask’s Architecture Machine</td>
</tr>
<tr>
<td>Agent</td>
<td>Using content</td>
<td>Pask’s Architecture Machine</td>
</tr>
<tr>
<td>Reciprocator</td>
<td>A use of others obtaining or using content</td>
<td></td>
</tr>
<tr>
<td>Referee</td>
<td>Making of content</td>
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</tr>
</tbody>
</table>

Table 5: Mapping Moore and Anderson’s modes to Pask’s analysis and the relationships with content
The patient mode enables people to obtain content in an environment. For Pask the sharing of content in the architecture machine from the designer to the computer or vice versa works in the same way. The agent mode is the use of content in the environment. This relates directly to the architecture machine’s bottom two quadrants supporting this use. A reciprocator mode is the awareness of the obtaining or use of the content by others. This still relates back to the patient or agent modes and, therefore, still relates to the architecture machine. This is expressed by those “liking” the posts of others on the #LoveWight Instagram. However, the referee mode has been made to fit the circumstances above by defining of new rules, further to the awareness of the very simple rules for making the #LoveWight content. This is an example of Bishop’s “authoring” as making new rules. It is an example of protagonist activity as the making of an adaptation of a concept. There was also some evidence of “activation” and “community” both inside and outside of the #LoveWight project through tagging. Thus it is the case that new concepts and new uses for existing concepts were facilitated in the #LoveWight digital social layer and, although there are no known examples of the concepts being used outside of that layer, the principles at work can be summarised as follows:

A responsive environment can support the obtainment, use and making of concepts through the interactions between people, digital technologies and that environment. It is the sitting of these relationships with “concept production” that define a responsive environment. These attributes can be supported through both synchronous and asynchronous interactions.  

As a way of testing this summary it is significant that for Drawing 10 there is no separate environment as in Pask’s Drawing 9. Pask was trying to supply as system that would work in all cases, for example, a digital layer over any environment designated. Yet, drawing 10 does seem to support the thought experiment that Facebook is a responsive environment precisely because there seems to be no

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123 The development of these principles from the Pask’s drawings shows the continued value in cybernetics, redressing to some degree the popular and academic antipathy to the subject, specifically in terms of the focus on concept production and reference to the real world.
separate environment required for the process of concept production to occur. However, Pask still considered that there was a world outside of these processes. This is represented in drawing 9 in the top right as “Observer’s Recording equipment”\textsuperscript{124} Furthermore, the whole tenor of Pask’s work was to inter-relate people with happenings in the world through a computer supported conversation, hence, his focus on architectural matters and real world deployment, e.g. “The Fun Palace project” (Fernandez 2008; Mathews 2006). It is also important to remember that the “interface”, represented as the vertical line and cups in drawing 10, is a repository of information as a resource outside of that process. Logically, unless we supply content to Facebook there is, in fact, nothing in the system. Therefore, though a digital-only responsive environment such as Facebook may be beguiling, to use a phrase: there can be no substance in that proposition\textsuperscript{125} This approach accords with the imperative of the “spatial self” concept as “shaped by the character of a physical place and the ways users associate themselves with physical place”.

The approach is to seek to situate that environment as a real space even if it is represented symbolically through hand signals. This is in part as a reaction to the individualising tendencies of Facebook and other social media. Furthermore, the WELL community and the concept of the “spatial self” show the enhancing capabilities of that digital layer in relation to a real space. A further example is offered. The Isle of Wight Heritage Facebook Group is a latter-day case in point. The group, discovered during the #LoveWight project, has over 14,000 members (The Isle of Wight Heritage 2015). The Facebook posts cover a wide range of subjects always rooted in places on the Isle of Wight through photographs and memories submitted. This is a group that exists “virtually”. However, all of the

\textsuperscript{124} This was one of the parts of the construction that followed Turing’s protocols (Turing 1950).

\textsuperscript{125} This does not stop Second Life or Peterson’s CD-ROM of the Solar System qualifying as both have referents out to real spaces, but only in the former case when representing real spaces.
concepts/content are made from the real space of the island sustained through the digital social layer. There is no online group without that.¹²⁶

The significance of social media as a facilitator of responsive environments was further informed by recalling a paper by Floridi previously scanned during the development of the practice projects but now brought to mind in reflection on the #LoveWight project. Floridi’s paper “Information Ethics, its Nature and Scope” (2008) had sought to examine the processes by which information was distributed and affected by people in society. He began by positing a diagram, Figure 84 (2008 p.43). This had agent “A” obtaining information (info-resource) from the Infosphere as a separate entity.¹²⁷ Furthermore, “A” could use information to specific ends (info-targets) and make new information (info-products).¹²⁸

![Figure 88: The Floridian “External” R(esource) P(roduct) T(arget) Model (Floridi 2008, p.43)](image)

¹²⁶ Other examples include the work of MIT’s Center for Civic Media: “[C]ivic media is any form of communication that strengthens the social bonds within a community or creates a strong sense of civic engagement among its residents” (Center for Civic Media 2016). The center incorporates the work of Henry Jenkins and others (Jenkins 2016), and the University of Surrey’s Digital World Research Centre with its focus on working “with individuals, families and communities on the use of self-made media” (DWRC 2016).

¹²⁷ This equates to Moore and Anderson’s “patient” mode.

¹²⁸ Moore and Anderson’s “agent” mode.
There is striking correspondence with regard to the forms of obtaining, using and making concepts, i.e. Pask’s Drawing 9 (with the added ability to make concepts), that contribute to and can be obtained from an environment, in this case, the Infosphere. However, Floridi did not stop there. He argued that this diagram worked at an epistemological level as if it was possible to be outside the Infosphere. He then proposed Figure 85 as an ontological conception of the Infosphere (2008 p.45). This is not a surprise when referring back to Floridi’s concern with *Homo Poieticus* and the inter-relating of the human with *techne*. This is to understand how humans are embedded in the Infosphere.

Thus, Pask’s drawing 10 could be related to Floridi’s diagram above as they both assume integration with technologies. For Pask, this is something for cybernetics to aspire towards as a means of developing creativity and innovation and always in a real space. For Floridi, it is a result of the ubiquity of information in a digital form imbuing our ontological world. This provides a condensed version of the “spatial self” with emphasis on the processes in the digital layer. This does not mean that all activity takes place in a digital space but that that digital space is part of our experience of the real space. Although Pask and Floridi have come at this formulation from different perspectives, and with the latter not referencing the former, there is a synchronicity in terms of the development of information/
concepts in relation to people and the environment. They both explore how that environment enables the obtaining, using and making of information/concepts. Most importantly, they supply basic principles, as an outcome of this PhD research, by which such environments should operate:

Responsive environments should enable the obtaining and using of new content by participants in situ and the making of new content and new uses of existing content by protagonists in situ and beyond. These opportunities are supported by synchronous and asynchronous interactions through live installations, digital layers enabling archiving of content and/or digital social layers furthering social interactions through their content.

This accords with the “two-way” potentiality of responsive environments to support responses by people via a digital layer.129 This is further enhanced through a component, not explored by Pask or Floridi, of a digital social layer that can document that activity and distribute existing and new concepts beyond its environs.130

5.6 Conclusion

The obtaining, use and making of new concepts through cybernetic mutualism can be supported in responsive environments enhanced by a digital social layer. The phasing through these purposes moves the user/visitor from participant to protagonist. The previously cited paper by Neuhofer, Buhalis and Ladkin, provide a further synchronicity with Pask’s and Floridi’s formulations with an added temporal dimension. This is an amalgam presented as an abstraction from an analysis of tourism experiences, containing an inter-relation of obtaining, using

129 In her recent second edition of Computers as Theatre, Brenda Laurel acknowledges these possibilities under the heading “design for emergence”: “A simple instance of emergence is when an interactor does something you did not foresee and for which you did not consciously design the potential” (Laurel 2014, p.207). Given the metaphorical focus of Laurel’s work might the term “protagonist” be fitting for such activity? It might be possible to design for unforeseen emergence too?

130 David Gauntlett in Making is Connecting (2011) calls for Web 2.0 tools to be “...as open and as inviting as possible; and offer platforms where people can truly make their mark, express themselves and shape their environment”, and for: “Expressive messiness, rather than Facebook-style neatness” (Gauntlett 2011, p.225).
and making of content. This is a process of reception, application and production in information-based systems through a digital social layer but related to human experiences in a real space, the co-creation of an example of the Internet of social things, see Figure 90.

This formulation can be assessed from a “spatial self” (Schwartz and Halegoua 2015) perspective with regard to the three phases at work. In the first phase there is a digital connection made to the site that may rely on a range associations and advanced communication that inserts a latency into the relationship i.e. through the advanced envisioning of what is to come from a visit to the site. As expressed in Saker (2016) recommendations from other tourists as well as tourism suppliers may encourage a visit. This was the approach taken with the pre-publicity for the autumn half-term break in the #Lovewight project. However there is a lag between the reception of this content and the opportunity to experience it in person. As shown in the Wild Things on Captivity project such a lag can enable alternative stimuli to divert attention. However latency per se is not necessarily a problem as the time between obtaining content and further utilising it is not a controlling factor if applied from a “spatial self”

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131 It should be noted that neither Pask’s or Floridi’s prevents lag in the system nor is it necessary a bad thing. The response time is specific to the circumstances of the responsive environment under analysis.
This form of asynchronous interaction can enhance the relationship with the responsive environment. In this case a Tweet from a tourist location may stimulate a later arrival by a third party with no social connection with the sender of the Tweet. In this case there must be a lag between the reception of the tweet and the arrival on site. The second phase at the site provides for synchronous interactions. As seen in the first practice project at Dimbola Lodge latency and lag can be detrimental to the live appreciation of content. However, the technology of digital social layer enables immediate interactions with those also in situ. Imminent information can enable those present to act and experience aspects of the environment: they co-create that live experience. This was expressed by those who hashtagged and @ tagged the #LoveWight content as it was uploaded (both from a personal and a commercial perspective). Furthermore this activity can enable reception of content by those not yet on site and those that are no longer on the site. The latter third phase of referring back to a previous experience continues to co-create the environment through representations of content gained when in situ. This geographical separation does not prevent a sense of a continuance with the content of the location. However here the “latency” is due to that spatial separation. In this sense the “spatial self” is defined in part by reference to real but remote places as well as those that are geographically close temporally and spatially.

Neuhofer, Buhalis and Ladkin’s specific implementation relates to commerce and consumption but the underlying principles accord, via Pask and Floridi, with relationships to any concepts, for example, with the implementation of Bishop’s categories of “authorship”, “activation” and “community”. Furthermore there is the possibility of further gains to be made from additional analysis from contemporaneous activities in augmented reality, mixed reality and locative media research. The inclusion of a temporal component of “before, during and after” relating to a real space further enriches the formulation as it may describe a time limited responsive environment and/or one person’s or a group’s relationship with an ongoing RE. This is a starting point for further research.
The aim of developing principles of use within the area of study has produced some results. The inter-relation of obtaining, using and making concepts/content in a responsive environment supported by a digital social layer and synchronous and asynchronous interactions has moved the focus on from the cataloguing of instances of sound and vision in compendia.

A key component of the relationship between people and digital technologies and environments is the concept of interactivity. This includes the forms of communication that may occur between the parties involved and the sense that such communication could through Pask’s “mutualism” enabling “concept production”. Further to the experiences gained from the KikiT VisuoSonic Research Group, the focus turned to the action on the user/visitor and the place within which this occurred. The concept of responsive environments came from this contemplation and the following questions for the research:

Whom or what is responsive?
What is the influence of the specific context of the environment?
What are the outcomes of these combinations?

The Literature Review explored the concept of responsive environments across domains revealing a number of themes proposed as starting points for further practical research.

These themes related to roles, positions, opportunities for learning, opportunities for developing the content, the content forms of sound and visuals but also including presence, and the conveyance of values. These themes went
further in exploring the forms of activity that people might be engaged in in a responsive environment.

Additional contemporaneous activity was researched under the headings of Augmented Reality, Mixed Reality and Locative Media. This research informed the practice projects. The first practice project utilised a form of augmented reality as the Mad Hatter’s Magic Mirror. The majority of respondents complied with this remit but a few people tried something new and gave indications that even when a responsive environment was “locked down” there were opportunities for re-interpretation or repurposing. However, such opportunities were limited and constrained and also hampered by technical lag in the gallery at Dimbola Lodge.

The second practice project utilised a digital layer as a form of mixed reality allied to the Bestival music festival as couched as a safari park. The second project suffered from a range of technical and other difficulties but the premise had been explored. The third practice project utilised a digital social layer and the concept of the “spatial self” to key the #LoveWight hand signs into the real place of the Isle of Wight.

A detailed justification of the notion of a digital social layer as part of a responsive environment was worked through leading to the #LoveWight project. This included a historical analysis of the tensions between individualisation of online technologies against community activities that went back to the formation of the WELL community over 20 years ago. Schwartz and Halegoua’s concept of the “spatial self” offered a means of further developing this idea.

The #LoveWight project was the symbolic representation of a place through signs that, if promoted sufficiently, could have “gone viral” and become part of the iconography of the island. Due to a number of organisational problems, the collaboration with Visit Isle of Wight, the destination management organisation,
did not materialise. However, a range of content was created by people for the 
#LoveWight project giving indications across the developing criteria of 
protagonist behaviour, with reference to Bishop’s criteria of “authorship”, 
“activation” and “community” and expressions of the “spatial self” through 
synchronous (situations) and asynchronous (exhibitions) interactions (cf. Hogan 
2010).

These findings encouraged further reflection, and the discovery of Paul Pangaro’s 
Pask Archive and, specifically, Pask’s proposal for a system of concept sharing in 
relation to an environment, Drawing 9. Furthermore, Pask also proposed a system 
for concept production and mutualism through the development of ideas as 
“cybernetic mutualism”, Drawing 10. Out of this came the thought experiment of 
a social media platform, specifically, Facebook as an RE. A number of aspects 
were worked through but, in the end, the idea was rejected because of the 
 logical need for real world content to be brought into Facebook for it not to 
atrophy. This further strengthened the notion of the use of the digital social layer 
as an enhancer of real world spaces/communities as an expression of the “spatial 
self”. This led to the further reflection that Pask’s formulations mapped to 
Floridi’s diagrams relating an agent “A” to the “Infosphere”. This synchronicity 
is significant. This was further supported by Neuhofer, Buhalis and Ladkin and 
their model that bore considerable similarities to Pask’s and Floridi’s systems but 
with the inclusion of a temporal dimension. There was mix of the obtaining of 
content/concepts, use of the existing content/concepts and opportunities for the 
making a new use or something new from the content/concept, the possibilities 
of a shift from participant to protagonist, a consumer to a co-creator.

Furthermore, Neuhofer, Buhalis and Ladkin supply a temporal version of this 
cybernetic system that can offer a set of principles for the development of 
responsive environments with a digital social layer (2012 p.40). This can 
describe, a time-limited RE and/or one person’s or a group’s relationship with an
ongoing RE, all this enriching the developing concept of the Internet of social things. In short, there is plenty to be explored in future research.

The context of that research can be mapped to a number of the contributions made through this PhD research project leading onto suggestions for further study.

The extension of the concept of responsive environments to include synchronous and asynchronous interactions is a major contribution to the area of study. However there is more work to be done in terms of defining the possible qualities of these forms of interaction. Latency and lag are factors that can both hinder and help further interactions depending on the context.

The responsive environments concept is offered as an area of study, supplying sites for such activities and requiring the concept of presence in situ. There is more to be investigated through the categories offered by defining presence in REs and inter-relating those categories with the developing concept of “protagonist” and the “spatial self” in this context.

The focus of the present research has to been to develop principles of practice. There is more work to be done in the historical analysis of responsive environments use and conceptual development. This analysis would need to be extensive to explore all the inter-connected nuances across the entire area of study.

There is more work to be done in the inter-relation of Floridi’s concept of Homo Poieticus with the concept of responsive environments as an example of the bringing together of humans and technology in a dynamic relationship supporting global values as an ethical aspiration. This could lead onto further analytical and practical projects.
The challenge of critiquing the term “participant” in the area of study by extension with the term “protagonist” in responsive environments needs further justification through theoretical and practical analysis.

The themes drawn from the project into existing responsive environment research need to be further examined and tested to assess their currency and efficacy across all forms of REs and to confirm that they are comprehensive in their coverage.

There is considerable scope to incorporate further aspects of contemporaneous activities i.e. Augmented Reality, Mixed Reality and Locative Media into instantiations of responsive environments.

The “digital social layer” concept needs further investigation. For example, there is evidence of a higher take-up by women with regards to the three practice projects. A study into participants/protagonists and gender warrants investigation.

There is further work to be done regarding the cybernetic theories of Gordon Pask (and colleagues) in the context of responsive environments. The examination has drawn out some parts of the process of “cybernetic mutualism” but there is more work to be done regarding the possibilities enabled by this process.

The application of the Paskian “cybernetic mutualism”, of obtaining, using and making concepts, to Neuhofer, Buhalis and Ladkin’s mapping of people, a digital social layer and an environment with a temporal dimension and an example of the Internet of social things, is the next step in the research.

This leads onto specific follow up projects to explore these contributions:
Forthcoming theoretical investigations:

Paper for *Journal of Media Practice* exploring the applications of Pask’s cybernetic theory of concept production in media-based teaching at HE level.

Paper for *New Media & Society Journal* exploring the notion of “protagonist” in the context of responsive environments.

Paper for *Information Communication & Society Journal* exploring Floridi’s philosophical approach combined with Pask’s “cybernetic mutualism” with regard to the concept of responsive environments.

Forthcoming practical investigations:

A Twitter-based Project for the London Design Festival. Negotiations are underway with the Theatre and Performance Department at the Victoria and Albert Museum to site a responsive environments project.

“Mise en Cuisine”: an AHRC-funded bid to investigate aspects of cuisine from a multi-sensory perspective, *in situ*, in collaboration with Lulie Biggs, Flavour SenseNation and Simone Gumtau, University of Portsmouth.

These projects will feed into each other in an academic practitioner mode continuing the interweaving of theory and practice around the phenomena of participants/protagonists and responsive environments further developing the area of study.
Appendix A: Russell Richards’ Curriculum Vitae

Russell Richards MA, BA HONS, PGCE

russell.richards@solent.ac.uk             023 80 319058

Designation: Senior Lecturer in Music, Media and Visual Arts, School of Media and Technology, Southampton Solent University, UK - joined April 1996.

Research strands: Member of KikiT VisuoSonic Research Group researching the integration of sonics and visuals in interactive live performances. Member of the FCI Interactive Media Research Cluster. Researching towards a PhD in Responsive Environments at Southampton Solent University.

Special Interests:

Responsive Environments
Interactive Audio-visuals
Web Platform Development
Experimental Film

Qualifications:

MPhil/PhD Transfer completed Feb. 2014.
MA in The History of Ideas: University of Northumbria at Newcastle: Pass: 1993
PGCE Teacher Training: Thames Polytechnic: Pass: 1989
BA HONS Cultural Studies: Portsmouth Polytechnic: 2.1: 1987
City and Guilds: Electronic Servicing 224 Parts I & II: Hilsea Skill Centre: 1978

Professional Membership: BAFTA, Rhizome, PublicScreens.no.


Editorial Roles (previous/current):

Article reviewer for Journal of Media Practice, Intellect Ltd.
Book proposal reviewer for Media section of Sage Publications Ltd.
Hidrazone.com (Digital Arts Hub) Editorial Panel.
VisuoSonic.org (KikiT VisuoSonic Performance Web) Editorial Panel
Papers:


Feb 12  CROFT: CADIC Online Framework and Toolset for Intellectual Capital Management in SME Clusters. with Elizabeth Vokurka and Patrick Humphreys for the *DSS2012 Conference*, Greece

Jun 06  Users, Interactivity and Generation. *New Media and Society Journal* 8(4), pp.531-50

Apr 05  The Concept of the Covertor, a working practices paper for the inauguration of Hidrazone an on-line research hub for digital arts. HEFCE Capability fund supported. Southampton Institute. www.hidrazone.com


Apr 01  Adding a New Dimension to On-line Learning Support - The Creation of a 3D Intranet Environment for MA Interactive Production in the Faculty of Media, Arts and Society. Russell Richards and Mike Weaver. *Journal of Media Practice*, 1 (3) pp.157-64
Projects/Performances (last ten years):


Forthcoming: Twitter-based Project for the London Design Festival 2016, TBA

Forthcoming: “Mise en Cuisine” An AHRC-funded bid to investigate all aspects of cuisine from a multi-sensory perspective. With Lulie Biggs, Flavour SenseNation and Simone Gumtau, University of Portsmouth

Nov 2014 The Nightwatchmen Album and Book launch projection/installation, Ventnor Botanical Gardens, Ventnor, Isle of Wight

Sep 2014 “Wild Beasts in Captivity” - a responsive environment installation turning the festival site into a game reserve, The Science Tent, Bestival Music Festival, Isle of Wight

Aug 2014 The Nightwatchmen performance projection/installation, Dimbola Lodge, Freshwater, Isle of Wight

May 2014 A Sense of Place Conference, University of Portsmouth, music performance with Rob Thompson and Julian Wolfreys

Dec 13/Feb 14 Time and Tide: A Film Installation with Computational Audio with Paul Windridge, DUET Open Exhibition, Michael West Gallery, Quay Arts Centre, Newport, Isle of Wight

Nov 2013 “Mad Hatter”s Magic Mirror” installation as part of the The Wonderland of Alice Exhibition at Dimbola Lodge, Freshwater, Isle of Wight
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>May 2013</td>
<td>KikiT VisuoSonic Performance for the Salvem El Cabanyal Festival in Valencia, Spain</td>
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<tr>
<td>Oct 2012</td>
<td>KikiT VisuoSonic Presentation/Performance/installation at the Visioneca Film Festival, Freshwater, Isle of Wight</td>
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<tr>
<td>Mar 2012</td>
<td>KikiT VisuoSonic Presentation/Performance as part of Sarah Hand’s Photography Show “Notes from the Playground”, The Wall Gallery, University of Wales, Newport</td>
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<td>Oct 2011</td>
<td>“Synaesthesia: An Insider’s View” documentary short screened at the Frequency Festival, Lincoln</td>
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<td>Oct 2011</td>
<td>“Meshwork” sound derived linear animation for Trampoline digital arts network: “Attention Structure” for the Frequency Festival, Lincoln</td>
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<tr>
<td>Jun 2011</td>
<td>KikiT VisuoSonic Performance for the Southampton Solent University Graduate Fashion Show, Southampton Solent University</td>
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<tr>
<td>Dec 10-Feb 11</td>
<td>“Open See Some of Me” a KikiT VisuoSonic Installation, Open Exhibition, Quay Arts Gallery, Newport, Isle of Wight</td>
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<td>Oct 2010</td>
<td>KikiT VisuoSonic Performance with Natalia Data, “Music in the City” The Bargate, Southampton</td>
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<td>Date</td>
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<tr>
<td>Sep 2010</td>
<td>KikiT VisuoSonic Performance/Presentation at the TaPRA (Theatre &amp; Performance Research Association) Conference, University of Glamorgan, at the ATRium, Cardiff</td>
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<tr>
<td>May 2010</td>
<td>KikiT VisuoSonic Performance for the Southampton Solent University Graduate Fashion Show, Southampton City Docks</td>
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<td>May 2010</td>
<td>KikiT VisuoSonic Presentation, Research and Enterprise Conference, Southampton Solent University, UK</td>
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<td>May 2010</td>
<td>KikiT VisuoSonic Performance at the “New Technologies in the Theatre” Symposium, Sheffield University</td>
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<td>Mar 2010</td>
<td>KikiT VisuoSonic Performance at the “Xposed Jazz Club”, University of Gloucestershire, Albert Road, Cheltenham</td>
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<tr>
<td>Jun 2009</td>
<td>KikiT VisuoSonic Performance for the Southampton Solent University Graduate Fashion Show, The Guildhall, Southampton</td>
</tr>
<tr>
<td>May 2009</td>
<td>KikiT VisuoSonic Performance/Presentation, Bulgarian Technical University, Sofia</td>
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<tr>
<td>Nov 2008</td>
<td>KikiT VisuoSonic Performance, Constructed Exhibition, Sainsbury Centre for the Visual Arts, University of East Anglia, Norfolk, UK</td>
</tr>
<tr>
<td>Sep 2008</td>
<td>KikiT VisuoSonic Performance/Presentation Fast Forward: Exploring the Visual-Sonic Interface, Birkbeck Cinema, Birkbeck University</td>
</tr>
<tr>
<td>Jul 2008</td>
<td>KikiT VisuoSonic Performance/Presentation, ISEA International Symposium on Electronic Arts, Singapore</td>
</tr>
<tr>
<td>Mar 2008</td>
<td>KikiT VisuoSonic Performance, Sala D’Actes, Facultat de Belles Arts, Universitat Politecnica de Valencia, Valencia, Spain</td>
</tr>
</tbody>
</table>
Feb 2008  KikiT VisuoSonic Performance, Sallis Barrey Theatre, Brighton University, UK

Dec 2007  KikiT VisuoSonic Performance, Eye-Music: Kandinsky and All That Jazz Exhibition, Sainsbury Centre for the Visual Arts, University of East Anglia, Norfolk, UK


Sep 2007  KikiT VisuoSonic Performance, 13th International Conference on Virtual Systems and Multimedia (VSMM07), Queensland University of Technology, Brisbane, Australia

Jul 2007  KikiT VisuoSonic Performance, Freequay Experimental, Quay Arts Centre, Newport, Isle of Wight, UK

May 2007  KikiT VisuoSonic Performance, Technarte: Art and Technology Conference, Bilbao, Spain

Apr 2007  KikiT VisuoSonic Performance, Nassogne Community Centre, Belgium

Apr 2007  KikiT VisuoSonic Performance, Musee D’Art Modern, Liege Belgium

Apr 2007  KikiT VisuoSonic Performance, Ventnor Baptist Church, Ventnor International Jazz Festival, Ventnor, Isle of Wight


Oct 2006  KikiT VisuoSonic Performance, Grange Du Faing Gallery, Jamoigne, Belgium

Sep 2006  KikiT VisuoSonic Performance, Bulgarian Technical University, Sofia

Sep 2006  KikiT VisuoSonic Conference Workshop, Bulgarian Academy of Science, Sofia

Jul 2006  KikiT VisuoSonic Conference Workshop Southampton Solent University, UK
Appendix B: First Practice Project Additional Documentation

B.1 First Practice Project Concept Development

Figure 91: Proof of concept shot (sample image used).

The above application was produced in advance of the meeting with Bob Cotton, Trustee, Gail Downey Middleton, Managing Director for Trading Company and Rachel Flynn, Exhibitions and Collections Co-ordinator, to determine whether the concept would be viable as part of “The Wonderland of Alice”. It was decide from that meeting on May 21st 2013, that the concept was interesting and different iterations should be mapped out and offered to the Dimbola team. The full reply to this request is available below as Support Document 1. The format that the Dimbola team decided upon is quoted:

A mirror (actually a flat screen monitor with a wooden frame surround and a concealed webcam and computer) that when you look into it overlays a random face from the exhibition. This addresses the suggestion to involve the visitors in Alice's world. The advantage of the faces being random is that one visitor looks in the window and remarks "I've turned into Alice" then another visitor is keen to try and turns into the Cheshire cat.
Discussion took place in terms of the rig for the installation and the Dimbola team agreed to source the monitor with the rest of the equipment to be supplied by the author. This format also required the purchase of a tablet that could both run the application and have a HDMI output to connect to the monitor.

![Proof of concept shots of prototype app showing output on a television monitor.](image)

In order for the installation to be viable there was need for both the application and the hardware to be configured. Furthermore, that the tablet running the application could work effectively with a monitor. Figure 2 above shows a tablet working in “mirror” mode i.e. that the same content appears both on the tablet and the monitor. Thus, it was possible to confirm to the Dimbola team that the rig, relating the tablet and monitor together, was possible. The images used were ones obtained from the Internet for the purposes of the app development only. The request for copyright free images was submitted to the Dimbola team.
The Dimbola team supplied images from the exhibition that had already had copyright clearance e.g. Mad Hatter, Red Queen, Dee, Little Red Queen, Dum, Alice. From these images it was possible to assess the requirements for each of the images in terms of the proportions of the heads and their placements on the visitors’ shoulders. One outcome from this research was the effect of heads turned in different directions. Initially, most of the character heads chosen were “full-face” so that they would sit neatly on the visitors’ shoulders. Furthermore, the orientation would look as if the character was looking back out of the “mirror”. However, there are advantages in having heads looking in different directions. This arrangement allows for inter-play between the visitors in the picture, as they appear to be looking at each other. Furthermore, this sideways attitude also gives the impression that the characters may be looking at something within the mirror. It is also the case that not all the available images, e.g. the Mad Hatter are full-face heads. Consequently, these additional possibilities are opened up. Having confirmed with the Dimbola team that the images to be used worked with the app. The next step was to return to the specification above and design the app to work with multiple, random heads.
The figure above shows eight heads in situ over a grid of nine identical faces. In fact the face in the bottom left hand corner actually as a “head” over it but in this case the head is invisible. The Dimbola team thought that it would be interesting to include an invisible head and thus that the visitors to the installation would not be covered all the time with character heads. The above image shows a snapshot of the app in action. However, a photographic still cannot show the fast changing nature of the display i.e. the random code encourages the heads to move from face to face quite quickly. On closer analysis, this “flitting” between heads is due to the nature of face detection i.e. the app is analysing the image for faces constantly, specifically a mouth, two eyes and the rim of the head. Given the definition of the image it is quite possible that, for a split second a face will not be detected and then detected again. The consequence of this is that there is a cascading of heads across the available faces. If the additional capability of any given head having a random head applied to it is included in the mix then the amount of “flitting” is increased. It was at this point, following the mode of development as mentioned above i.e. Rogers, Sharp & Preece 2011. It seemed pertinent to put the available mode of heads on visitors to the Dimbola team to come to a specific iteration that then could be tested in situ. Indeed, the perceptual problems associated with the
“flitting” caused by the use of random heads as proposed in the original idea necessitated a re-think in terms of the form of app to be used in the gallery. The Figures 91 and 92 show the two proposed approaches with the Dimbloa team choosing to have the different heads on each visitor, Figure 92.

Figure 95: Same Character Head on Each Visitor (Alice and Tweedle Dum shown).

Advantages: It runs smooth with the same character head on each. After a period of time, that we can set, the next character head will appear on each head. The first head shown can be pre-chosen i.e. that the first head can always be the Mad Hatter.

Disadvantages: It is the same character’s head so no variety at one time. If a visitor does not like that character they have to wait the period of time we set for another head to come along.
Advantages: This is a combination of the first two. The heads that appear are always in the same order so no random heads. As previously, the Mad Hatter could appear first. The result is less flitting of the heads as they stay in the same order at all times.

Disadvantages: There is less variety in this form. This form reduces but does not remove the flitting effect because of the issue the face detection detecting and then not detecting the visitors.

B.2 The Evaluation Procedure

Rogers, Sharp and Preece (Rogers, Sharp and Preece 2011), provide a number of key questions to be answered in determining the evaluation methods to be employed, their applicability and the issues attached to each.

B.2.1 Should the data be treated statistically?
Only 31 people saw and interacted with the Magic Mirror over the two days. This is not a number from which trends or definitive decisions can be drawn. However, this project is a prototype and, as such, any evidence gathered can be used at least to provide indicators towards further research.

B.2.2 How to present and analyse the qualitative data?
Only seven people filled in questionnaire (data discussed in the main document page. The purpose of each questions supplied:

a) Why did you come to the exhibition?
To assess whether the visitors had come to Dimbola Lodge specifically for the Alice exhibition.

b) What do you think of the Mad Hatter’s Magic Mirror?
An open question to offer an opportunity for an opinion.

c) Did you understand what you had to do?
A technical question to assess if there were any issues to do with the design of the installation.

d) What did you do?
To offer a chance for visitors to describe their behaviour with reference to role and position.

e) How did it make you feel?
To try to ascertain if there was an emotional response to the installation.

f) What did you learn from the experience?
To see if there was anything taken away from the installation, at least in terms of cognitive learning.

g) How could the Mad Hatter’s Magic Mirror be improved?
To assess if the visitors could offer forms of improvement or possibilities of repurposing. Also assessing how they responded to the installation.

This was just short of 25% of the visitors to the gallery. Comments gathered from the room during the installation are also included:

a) Why did you come to the exhibition?
1. Haven’t been before
2. To view the Mad Hatter’s Magic Mirror
3. Interested in Alice in Wonderland
4. 1. Lunch 2. To explore the gallery as usual - we are friends of JMC (Julia Margaret Cameron)
5. A chance to do something new / it looked interesting
6. My daughter wanted to visit
7. To see the exhibition - heard about it

b) What do you think of the Mad Hatter’s Magic Mirror?
1. Very good
2. Entertaining and fun - adds an interactive dimension to the exhibition
3. Good fun!
4. Fascinating - wanted to be the Red Queen
5. v. clever and a little surreal
6. Quite amazing - didn’t at first realise I was on it
7. Really good! Very clever

**c) Did you understand what you had to do?**
1. No, Russell explained
2. Yes, because other people were already interacting
3. Yes, because there were other people already in the room
4. Yes
5. No, not until I realised it was me
6. Yes
7. Yes

**d) What did you do?**
1. Stood back and looked in mirror
2. Played in front on the screen and watch the changes
3. Moved around in front of the screen - tested it to see how many characters came up!
4. ---
5. Moved about. I enjoyed the delayed effect
6. Various movements and positions
7. Stand in front of the TV

**e) How did it make you feel?**
1. Entertained
2. Happy - it’s fun
3. Happy! - enjoyed the experience
4. Amused
5. Humorous/funny dizzy
6. Quite unique and very pleased to be part of it
7. Just good fun!

**f) What did you learn from the experience?**
1. We looked good as the Mad Hatter
2. Time will tell...
3. I am the Mad Hatter
4. Impressed by the technology
5. ...
6. ...
7. ...

**g) How could the Mad Hatter’s Magic Mirror be improved?**
1. Larger mirror - prints made to take away
2. React more quickly
3. Timing of character changes - fluidity of picture - jagged movement
4. Might be able to capture the facial image and transpose these
5. Bigger, more people involved
6. I am not really sure, probably as technology progresses the more clearer picture could be got
7. Bit faster maybe

Photographs and video evidence was also taken. As with the case of the statistical analysis it is not possible to draw trends or definitive judgements from the limited evidence. However, as above, the purpose of the practice project was to gain indicators toward further research.

B.2.3 What is the reliability of the approach?

The use of questionnaires, video and photographic evidence and the capturing of statements made in the gallery enable some triangulation of the data. That is, it is possible to assess the consistency of the experience as recorded across the data. The use of open questions and the simple recording of what people say reduce the possibility of coaching of the visitors in terms of their responses. As mentioned above, no guidance was given regarding the use of the Magic Mirror beyond “Please stand in front of it and see what happens”. However, the limited amount of quantitative and qualitative data means that the reliability of the data can only be inferred in terms of indicators. Yet, there is evidence for the repurposing of the installation gained from even such a small sample. An indicator, at least, that the phenomenon is present even in clearly constrained interactive installations.

B.2.4 What is its validity?

The validity of the approach is dependent upon whether the questionnaires, video and photographic evidence and the recording of comments in the room are capable of capturing the sort after phenomena. The photographic and video evidence most clearly shows the ways that people responded to the installation. However, it should also be noted that, as with the Lozano-Hemmer’s *Bodies Movies*, the two women were aware that they were being filmed, and, in the
latter case, permission was sought to film in advance. There is, therefore, the possibility of the “Hawthorne effect” coming into play i.e. the two women are performing for the camera (Gillespie 1991). However, they were given no encouragement to behave in a particular way and in both cases they exhibited behaviour unseen over the two days and, therefore, may be some value in it. Clearly with such a small sample this is only indicative of repurposing/”referee” behaviour at best. The questionnaires and recording of comments back up this behaviour to a certain extent.

B.2.5 Are there any biases that may distort the results?

It can be inferred from the theoretical research that the author wishes to find evidence of repurposing of the installation and, therefore, the visitors taking on the role of protagonist. However, the results show that only four people showed any signs of such activity out of the 31 visitors to the installation. Furthermore, only two of these four were documented as doing so through a video record. No encouragement was given for such responses. As stated throughout, this evidence is only indicative and cannot be used to support definitive or biased statements. Given that the content of the installation was configured in part to appeal to children the fact that only one under ten year old interacted with the Magic Mirror biases the results in favour of the reaction of older respondents. In retrospect the remit of Dimbola does not naturally appeal to children or families with small children it is therefore not so surprising that so few children saw it. This may have been rectified if there had been pre-publicity for the installation. However, in the first instance, this prototype sought to discover any examples of repurposing of the content. Further study will investigate the qualities of that repurposing.

B.2.6 Are the results generalizable, i.e., what is their scope?

There is a small sample and any indicators of protagonist/repurposing behaviour are so limited that there can be no generalising of the results. Simply, it can be
argued that the practice project has resulted in indicators that can be further studied. However, the second practice project should address some of the research questions not covered in the first practice project and therefore, this may mean that the latter’s findings are left as they are i.e. That even when an installation is constructed that offers apparently a passive role there are indicators that visitors can take on a protagonist/repurposing position in relation to it.

B.2.7 Is the evaluation ecologically valid or is the fundamental nature of the process being changed by studying it?

It is in fact the lack of study of this phenomenon that has resulted in a skewing of outcomes of installations in favour of their look and technologies rather than their responses to/from visitors. However, it should be acknowledged that any study that seeks to capture data immediately sensitises the respondents in the direction of the themes under investigation. The data capture methods have attempted to mitigate against this i.e. open questions, limited instructions and no leading questions or statements were offered. Yet, the recording of feedback or still or video images in themselves is in danger of changing the intention of the visitors. As mentioned above, the use of more than one method of gathering data can help because triangulation can be used to check for skewing in the data e.g. did one method of data gathering produce different results from another method of data gathering?

B.3 Practical Issues

A key practical issue regarding the “Magic Mirror” was whether it could run for the entire length of the day i.e. 10 a.m. to 4.00 p.m. over the two days of the installation. Tests had been performed during the development of the practice project whereby the prototype was run continuously for six hours. However, with the late arrival of the frame for the Mirror, it was not possible to try out the rig until the day of the installation. The tablet that contained the application was
attached to the cardboard frame so that the camera could pick up the scene. This meant that the tablet was partially surrounded by cardboard and, therefore, in danger of overheating during the installation, see figure 86 below.

![Figure 97: The back plate of the Magic Mirror rig](image)

The author monitored this possibility for the entirety of the two days that the Magic Mirror was installed. No problems arose and the application worked consistently through the two days of the installation.

The stilted speed of the application was a cause for concern (although the demonstration to the team in advance of the installation showed that any delay in the refreshing of the screen did not prevent interaction). However, as detailed below the response from the visitors varied in this regard with some preferring the slow rate and others suggesting it could “react more quickly”.

The creation and installation of the Magic Mirror came at no cost either in terms of materials or rental of the space. The television was borrowed from Dimbola and the author supplied the remainder of the equipment.

**B.4 Addressing Ethical Issues**
In addition to conforming to the requirements of the Southampton University Ethics Committee's requirements (See Appendix One below), the CARVE mnemonic protocols were used as described by Connolly et al in their *Ethics in Action: A Case-based Approach* (Connolly et al 2009). Indeed, the former were integrated into the latter.

B.4.1 Consequences: Promote the best possible consequence from the practice project.

i. Principle of Non-Maleficence: Do not cause unnecessary harm to the visitors.

This aspect was assessed in terms of individual freedoms and physical or psychological harm. A notice was provided, see Support Document 2, that stated that no images were recorded in the running of the installation. The notice also warned of the possibility of flashing images and that the content required parental guidance. There was one response from the visitor that indicated that they felt dizzy from the experience. However, this did not develop into a more serious affliction.

ii. Principle of Positive Beneficence: Make something that benefits the visitor.

The central premise of the installation was to provide a stimulus that was complementary to the concept of the exhibition. One of the comments from the visitors indicates that they got the connection between the two. Furthermore, there is clear evidence for the majority of visitors having enjoyed the experience.

iii. Principle of Utility: Make something that is useful for as many visitors as possible.

The design of the Magic Mirror meant that it was accessible to anyone with two eyes and an identifiable mouth. As mentioned above, this meant that only visitors with beards would be at a disadvantage. In fact, none of the
visitors over the two days had beards. All visitors including one wheelchair user and one child were able to access the mirror.

B.4.2 Respect for Autonomy: respect and promote self-determination and competent persons.

The installation did not come with instructions. The aim was for the visitors to find their own way with the installation. Indeed, a central aspect of the goals for the installation was precisely to enable self-determination through the repurposing of it.

B.4.3 Rights: Respect individual moral rights of contributors and visitors.

The application prototype is built using the Ketai face detection library. A specific reference was included in the Notice in the room to that fact and with links to further information relating to the library. The rights of visitors were protected with regards to the use of their images by a Model Release form. It is also the case that the app itself hides the identity of those visitors who have had photographs taken of them from the mirror screen. In addition the Notice clearly stated that no recording of images was taking place by the application. The questionnaires did not ask for names or for personal information.

B.4.4 Virtues: Act according to good character.

In this regard, it can only be stated that the installation was staged and run with a good and positive attitude. All the questionnaire respondents offered positive comments about the installation itself.

B.4.5 Equality: Treat visitors with equal consideration and respect.

It can only be stated that the author endeavored to treat all visitors with consideration and respect. There were no comments to the contrary during the two days of the installation.
B.5 Support Documents

B.5.1 Support Document 1: Dimbola “Through the Looking Glass: The Wonderland of Alice” Exhibition

Apps and Projection proposals

1. Audio commentary triggered by face detection i.e. an app on a tablet that can supply different content as the visitor moves through the exhibition. As previously suggested this would be on a “loan tablet” to remove the necessity to download an app (as the app is to enhance the visit it would be of little use outside of the exhibition). Content: People in view on the displays speaking about the content of the room - Alice, Mad Hatter etc.)

This could be achieved without face detection i.e. by having faces that are pressed to hear the commentary at that point.

2a. A mirror (actually a flat screen monitor with a wooden frame surround and a concealed webcam and computer) that when you look into it overlays a random face from the exhibition. This addresses the suggestion to involve the visitors in Alice's world. The advantage of the faces being random is that one visitor looks in the window and remarks ”I've turned into Alice” then another visitor is keen to try and turns into the Cheshire Cat.

2b. A different take would be to have the same set up but as a face is recognised one of the characters pops into view as if peering around the edge of the mirror.

3. A mirror with a back projection screen instead of glass that shows the room “as a reflection” but not the people in the room. A video could be projected (perhaps using a mini-projector) that popped Alice characters into view periodically i.e. they seem to be in the same space but in different times.

Contact: Russell Richards KikiT VisuoSonic Research Group Southampton Solent University russell.richards@solent.ac.uk

B.5.2 Support Document 2: Notice - prepared as required by SSU Ethics committee.
Notice

The Mad Hatter’s Magic Mirror uses a camera to detect people’s faces and then place an Alice character head over each face. The images of children and adults are **not recorded** and thus are presented “live”. **No information** is stored regarding the people appearing in the “mirror”.

The Mad Hatter’s Magic Mirror uses changing imagery and thus caution is advised for those who are sensitive to **flashing images**.

Given the unusual content of the “mirror” we apply a “**Parental Guidance**” notice to it i.e. parents should accompany young children when they view the mirror.

-----------------------------------------------------------------

The Mad Hatter’s Magic Mirror uses the Ketai Face Detection system:

Copyright:
Ketai LLC, 2010-13
Authors:
Daniel Sauter, J. Duran

http://ketaiLibrary.org
http://www.gnu.org/licenses/gpl.html

Further details regarding the installation can be obtained from:
Russell Richards MA
Southampton Solent University
russell.richards@solent.ac.uk
Russell Richards from the Faculty of Creative Industries at Southampton Solent University wishes to take photographs or video film for research or publicity purposes. These images may appear in research papers or our printed publications, on our website, or both. Before taking any pictures, we need your permission. Please answer questions 1 and 2 below, then sign and date the form where shown.

Please circle Yes or No

1. May I use your image(s) in research documentation produced as part of my PhD research at Southampton Solent University? This will not be published.
   Yes / No

2. My research may feature either in printed publications or on the Southampton Solent University website. Can I use your images(s) in this way?
   Yes / No

Please note that websites can be viewed throughout the world, not just in the United Kingdom where UK law applies.

Name: ...............................................................

Signature: ...............................................................

Date: .................................................................

Please print your name in capitals: ...............................................................

FOR SOUTHAMPTON SOLENT UNIVERSITY USE

Signed on behalf of Southampton Solent University: ............................
Name: ...............Russell Richards MA................................................
Job title: .........Senior Lecturer in Media and Visual Arts....................
Event and location: Mad Hatter’s Magic Mirror Installation, Dimbola Lodge, Freshwater.
Photographer's name: .......Russell Richards...................
Photographer's contact details: ..Russell.Richards@solent.ac.uk...............  
Southampton Solent University, East Park Terrace, Southampton SO14 0YN
Appendix C: Second Practice Project Additional Documentation

C.1. Second Practice Project Concept Development

“Wild Things in Captivity” concept developed as a concept of returning animals to the wild as a means of engaging with a range of scientific themes which could be explored in the Bestival Science Tent. The Bestival site was couched as an “enclosure” in which the “animals” are kept for their own protection before being released back into the wild. On arrival they are “tagged” with a wristband. They are offered lots of “enrichment” during their stay to prevent boredom or repetitive behaviour. There are visiting hours during the day and feeding times.

In addition there are opportunities to develop good behaviour through the ethic of “leave no trace” and the recycling of nesting materials (i.e. take your tent home): Habitat Renewal.

The science themes include:

Cultural Anthropology
Biodiversity
Bioacoustics
Habitat Conservation

These ideas were developed within a few days, this in part due to the enthusiasm for the ideas and also the short timeframe in which materials had to be prepared for the Bestival Tent. Following Bill Buxton (Buxton 2007) sketches were made in Photoshop that progressed, through rapid iterations, into the completed posters shown in Figures 26 and 27 above.

The assumption was that content analysis could be used on the contributed content under each of the activities and that questionnaires could be used to follow this up. However, the lack of content meant that little content analysis and no questionnaires were, in fact, used.
C.2 The Evaluation Procedure

Rogers, Sharp and Preece (2011), provide a number of key questions to be answered in determining the evaluation methods to be employed, their applicability and the issues attached to each.

C.2.1 Should the data be treated statistically?

The answer to this question is a resounding, no.

C.2.2 How to present and analyse the qualitative data?

The qualitative data from this experience is mostly outside of the original goals. A questionnaire was prepared for the project but, in the circumstances, not used:

**Why did you come into the Bestival Science Tent?**
To assess if the visit was pre-planned in response to word of mouth or other stimuli or spur of the moment.

**What do you think of the Wild Things in Captivity projects/concept?**
An open question to offer an opportunity for an opinion.

**Did you understand what you had to do?**
A technical question to assess if there were any issues to do with the design of the installation.

**What did you sign up for?**
To offer a chance for visitors to describe their behaviour with reference to role and position.

**What did you take away?**
To ask an open question that might refer to the activity sheets, the content they produced and/or the content others produced or ideas from the Wild Things in Captivity projects/concept.
Did you change anything in the projects you chose?

To attempt to ascertain the degree to which respondents adjusted the Wild Things in Captivity projects/concept in response to their own interpretations.

How did it make you feel?

To try to ascertain if there was an emotional response to the Wild Things in Captivity projects/concept.

What did you learn from the experience?

To see if there was anything taken away from the installation, at least in terms of cognitive learning.

How could the Wild Things in Captivity projects/concept be improved?

To assess if the visitors could offer forms of improvement or possibilities of repurposing. Also assessing how they responded to the Wild Things in Captivity projects/concept.

C.2.3 What is the reliability of the approach?

The reliability of the approach is poor. However, it is the case that initial indicators were positive: a take up ratio of 130 : 137 is very good. Yet, the completion rate is so low that this optimism was effectively removed.

C.2.4 What is its validity?

The validity is also poor with little substantive that can be drawn from the targeted outcomes. Indeed, it is the validity of the project that needs to be reassessed given a detailed critique of the design of the project.

C.2.5 Are there any biases that may distort the results?

The biases in this case are in terms of a lack of viable results. Those entering the Bestival Science Tent may be predisposed towards “Habitat Renewal” and the other practices on offer. However, the purpose of the practice project was to
offer opportunities to contribute/be creative rather than (only) convert festivalgoers to the cause.

C.2.6 Are the results generalizable, i.e., what is their scope?

No.

C.2.7 Is the evaluation ecologically valid or is the fundamental nature of the process being changed by studying it?

This is “to be determined” as it is only with the completion of sufficient numbers of activities that such assessments can be made.

C.3 Practical Issues

These issues are so central to the projects that they are discussed in detail in the main document, page 116-18.

C.4 Addressing Ethical Issues

In addition to conforming to the requirements of the Southampton University Ethics Committee’s requirements (See Appendix One below), the CARVE mnemonic protocols were used as described by Connolly et al in their Ethics in Action: A Case-based Approach (Connolly et al 2009). Indeed, the former were integrated into the latter.

C.4.1 Consequences: Promote the best possible consequence from the practice project.

C.4.1.1 Principle of Non-Maleficence: Do not cause unnecessary harm to the visitors.
The activity sheets came with Terms and Conditions that encouraged the safe gather of content for the activities i.e.

The Wild Things in Captivity Project is offered for voluntary take-up and, as such, the Wild Things in Captivity Project takes no responsibility and is not liable for any damages to persons or property through the creation of Wild Things in Captivity content. Be safe; do not hurt yourselves or others. Be Wild Things in Captivity.

Also note the Bestival Terms and Conditions: “Bestival is for nice people and is about having a good time. Anti social behaviour will not be tolerated and you will be ejected without refund.” (http://2014.Bestival.net/info/terms-and-conditions)

The consent form was signed agreeing to this approach.

C.4.1.2 Principle of Positive Beneficence: Make something that benefits the visitor.

There is an argument that in taking part in the activities there were benefits to be had. The pitch was to be part of the gallery of work that was to be submitted to either the Facebook page or the Soundcloud site. The Habitat Renewal activity was a call to benefit the environment of the Bestival site. That this call was answered by over have of the festivalgoers spoken to is evidence of the value of that.

C.4.1.3 Principle of Utility: Make something that is useful for as many visitors as possible.

This is an interesting criterion to apply. Arguably the lack of content submitted could have been due to the lack of direct utility for the respondents themselves. They were sold the value of the project in terms of the PhD research but what of the value to them? This may be compared to another stall in the Bestival Tent featuring lazars that required special glasses to view. Word got round that these glasses were great for watching fireworks and large numbers of festival goers came in the tent, bypassing the author’s stall to get a pair of glasses for the closing fireworks on
Sunday night. The same group also gave out stickers resulting in 2225 stickers being given out. That is sixteen times as many contacts as the author achieved. Put bluntly, if the activities had been personally useful to the respondents there is a strong likelihood of a much better return rate/completion rate.

C.4.2 Respect for Autonomy: respect and promote self-determination and competent persons.

There were ample opportunities shown for personal expression through the five activities.

C.4.3 Rights: Respect individual moral rights of contributors and visitors.

Statements were included in the activity sheets to this effect i.e.

The Species Tracking Activity uses screen-grabs of GPS tracking taken by contributors with no identifications attached other than the contributor’s name if they agree to their name being used. Copyright for the content remains with the contributor.

Participation in the Wild Things in Captivity Project is voluntary. This includes all aspects of the project. If at any point you no longer wish to be involved in the project you can notify the Wild Things in Captivity Project team. If you wish to remove your contributed content from all Wild Things in Captivity Project platforms please visit the Bestival Science Tent during the festival and inform the team or contact the team on WildThingsinCaptivity@gmail.com.

The consent form referred to the need to agree to these Terms and Conditions when signing.

C.4.4 Virtues: Act according to good character.

It can only be stated that the author sought to conduct himself in a fair and acceptable manner.

C.4.5 Equality: Treat visitors with equal consideration and respect.
It can only be stated that the author sought to conduct himself in a fair and acceptable manner.

C.5 Support Documents

C.5.1 Support Document 1: Project Risk Analysis as required by the SSU Ethics Committee

This risk analysis is supplied in as comprehensive a manner as possible. If additional risks are identified during the project the author will contact the Ethics Committee with this additional information and seek further advice.

Possibilities of personal data loss/corruption:

No personal information (other than names of contributors if they have agreed for them to be included) will be visible online as part of this project. Furthermore, the focus for the research is the creative output only. Information such as addresses or other valuable personal information will not be sought. Opportunities to complete a qualitative questionnaire will be offered to a selection of contributors (no more than 50). However, the data requested will only include age and sex, with the majority of the questions relating to contributors’ attitudes to the project based on the specific PhD research questions. Two of the projects feature GPS tracking, however, this will not involve gathering of specific locations including addresses.

The following screen grab, from the Android app “GPS Tracker” is supplied to show the form of GPS information that will be stored on the “Wild Things in Captivity” Facebook. As can be seen there is no detail in terms of specific location or addresses.
The aim is to get an overview of movement and no detail e.g. that a festivalgoer returns to an area of the UK or beyond.

Possibilities of abusive/inappropriate content submission:

All the content that will be added to the "Wild Things in Captivity" Project sites will be done through contact in the Bestival Science Tent i.e. volunteers will go out to collect the content and bring it back to the tent for upload. The only exceptions will be “Habitat Renewal” project and the “Species Dispersal” project where, in each case, a specific email account (e.g. Weclearedourcampsite@gmail.com and BestivalSpeciesDispersal@gmail.com) will be created to receive the GPS image sent by contributors. Consequently, all material will be filtered by the "Wild Things in Captivity" Project team before uploading to the "Wild Things in Captivity" Facebook page or Soundcloud account.

Possibilities of abusive/inappropriate content creation outside of the supplied systems:

As this project is designed to be contained within the "Wild Things in Captivity" Facebook Page and Soundcloud account there is no direct threat of material being produced outside of that. However, the Terms and Conditions will include a caveat and the BBC caveat will be used as a model: “The BBC is not responsible for the content of external Internet sites”). Thus: “The "Wild Things in Captivity" Project is not responsible for the content of external sites or social media platforms”. It is possible that other festivals, or the Bestival itself, may take up
some of the ideas from the “Wild Things in Captivity” Project. If this is the case, contact will be made with the parties concerned to encourage positive use of the ideas. The gallery of cleared camping sites is an idea that could appeal to all festival sites purporting to be “green”.

Possibilities of hacking:

As all online content will be contained on sites whereby the author has administration rights if any hacking of the content takes place it can be deleted as soon as detected. However, if this is not deemed sufficient or merely encourages further attacks then either the author as “admin” or the platform concerned can delete that online presence completely.

Possibilities of contributors endangering themselves whilst taking a "Wild Things in Captivity" Project photographs or audio recordings:

The author has no interest in contributors taking undue risks in the making of content for the project. It is also the case that, within the confines of the festival, there are limited opportunities for inappropriate behavior by contributors. Furthermore, the Bestival has its own terms and conditions relating to behavior e.g.

“Bestival is for nice people and is about having a good time. Anti social behaviour will not be tolerated and you will be ejected without refund.” (http://2014.Bestival.net/info/terms-and-conditions)

However, a caveat can also be supplied as follows:

The "Wild Things in Captivity" Project is offered for voluntary take-up and, as such, the "Wild Things in Captivity" Project takes no responsibility and is not liable for any damages to persons or property through the creation of "Wild Things in Captivity" Project content. Be safe; do not hurt yourselves or others. Be "Wild Things in Captivity".

Possibilities of unmanageable success:

As the project will rely on people volunteering to take part having entered the Science Tent, it will be possible to monitor the numbers of contributors so that the number remains manageable over the course of the festival weekend. It is not envisaged that the take up of the “Species Dispersal” project will be large. Consequently, the author can manage the numbers involved.
Russell Richards MA
“Wild Things in Captivity” Project

Southampton Solent University 2014
C.5.2 Support Document 2 - Bestival Tent Risk Assessments

**Identified Risk** Trip Hazards  
**Likelihood** Low  
**Potential Impact** Physical injury to the public  
**Risk Management**

Some cables will be used for the following equipment:

- Laptop
- Mini-data Projector
- Tablet
- Wi-fi extender

However, these cables will be positioned to avoid any trip hazards for the public.

**Identified Risk** Electrical Equipment  
**Likelihood** Low  
**Potential Impact** Electric Shock injury to the public  
**Risk Management**

The following electrical equipment will be used:

- Laptop
- Mini-data Projector
- Tablet
- Wi-fi extender

However, the equipment will only be used by the exhibitors and, therefore, constitutes no risk to the public.

**Identified Risk** Line of Sight Issues from Mini-Data Projector  
**Likelihood** Low  
**Potential Impact** Eye injury to the public  
**Risk Management**

There is the risk of eye damage from data projectors. However, the mini-data projector will position to avoid any line of sight issues.

**Identified Risk** Presentation Board Integrity  
**Likelihood** Low  
**Potential Impact** Injury to the public  
**Risk Management**
A presentation board is to be used to display poster relating to the event. This will be secured to avoid any risk to the public.

Russell Richards MA
“Wild Things in Captivity” Exhibitor

Bestival Science Tent 2014
Research Project Title: PhD Practice Research: Wild Things in Captivity Bestival Science Tent Activities

Introduction: My name is Russell Richards and I am researching responsive environments for my PhD at Southampton Solent University. I would like to invite you to participate in this research project.

You should only participate if you want to, choosing not to take part will not disadvantage you in any way.

Before you decide to take part, it is important that you understand why the research is being done and what your participation will involve. Please take time to read the following, ask me if anything is not clear or of you would like more information.

Research aims

I am conducting a series of experiments to see how peoples’ relationships with an environment can be affected through the use of digital technologies.

Research method

I will use five practical activities to investigate the aims (these will be used subject to the terms and conditions of the projects):
Photo-Safari - to take pictures of the various “species” of Bestivalgoers. Volunteers will bring their pictures back to the Science Tent to submit them. Bonus Project: Habitat renewal - to take pictures of your campsite when you leave and submit them.

Species Tracking - people volunteer to plot their movements through the festival site using a GPS smart phone app and then submit them.

Bioacoustic Field Recordings - people volunteer to record sounds from the festival that capture the different “species” and their behaviour and then submit them.

Species Dispersal - people volunteer to track their journey back to their home “habitat” using a GPS smart phone app and then submit them.

Who I have asked to participate?

I am asking Bestival Festival visitors to volunteer to take part in one or more of the activities on offer.

Location of research

The study will take place at the Bestival Festival Site, Robin Hill, Isle of Wight from the 4th – 7th September 2014.

Duration of the research

The research will take place between 4th – 14th September 2014.

What does the research entail?
You will be asked to volunteer in the five activities as stated above. You submit the content you want to. It will be accepted as long as it abides by the Terms and Conditions. I will also be asking some volunteers to answer some questions about their experiences relating to the activities. This again will be voluntary.

Are there any risks involved in participating?

The risks are involved are minimal. You should abide by the rules of the Bestival i.e. “Bestival is for nice people and is about having a good time. Anti social behaviour will not be tolerated and you will be ejected without refund.” (http://2014.Bestival.net/info/terms-and-conditions) Please also follow the Terms and Conditions for each of the activities.

These are voluntary activities. If you no longer wish to take part you are free to stop.

Confidentiality

Your responses to the activities will remain in your ownership as stated in the Terms and Conditions. Your name will not be published with the content unless you specifically state that it can be used.

Direct quotes may be used in the final outcome. If they are they will be anonymised.

What if the participant has questions about the Research Project?
If you have any questions about this study please ask in the Bestival Science Tent during the Bestival Festival or contact WildThingsinCaptivity@gmail.com.

C.5.4 Support Document 4: Consent Form as required by the SSU Ethics Committee

Research Project Title PhD Research: Wild Things in Captivity

Researcher Name Russell Richards MA

I would like to contribute to the following activities (see Activity Sheets for details):

* Photo-Safari ☐ *Bonus Project – Habitat Renewal ☐

* Species Tracking ☐

* Bioacoustic Recordings ☐

* Species Dispersal ☐

1. I confirm I have read and understood the information sheet and the activity sheets, including the Term and Conditions and wish to take part in the above activities

2. I understand my participation is voluntary and I am free to withdraw at any time

3. I understand that any content will be used in accordance with the Terms and Conditions and that I will not be identified in the research report

4. I agree/do not agree to my name being used with the uploaded content

5. I agree to the anonymous use of quotations in the report

6. I further agree to a short interview. Yes/No

Name of Participant ........................................

Date       / 9 / 2014

Signature
C.5.5 Support Document 5: Wild Things in Captivity - Activity Sheet (sample)

Photo-Safari

You volunteer to take pictures of the various “species” of festivalgoers.

Bring your pictures back to the Science Tent for assessment. Alternatively, you can submit/post them to the Wild Things in Captivity Facebook Group.

If the pictures meet the guidelines set out in the Terms and Conditions they can then be uploaded to the Wild Things in Captivity Facebook Group or email them to:

WildThingsinCaptivity@gmail.com

Photo-Safari: Bonus Project

Habitat Renewal

You include pictures of your camping site after clearance of tent etc. These latter pictures should be sent to WildThingsinCaptivity@gmail.com for assessment regarding the Terms and Conditions and
then, if they pass, they will be uploaded to the Wild Things in Captivity Facebook Group.

Wild Things in Captivity - Photo-Safari: Terms and Conditions (as required by the SSU Ethics Committee, reverse side of activity sheet)

Each activity requires no personal information to be stored.

The Photo-Safari Activity uses pictures taken by contributors with no identifications attached other than the contributor’s name if they agree to their name being used. Habitat Renewal pictures will be treated in the same way. Copyright for the content remains with the contributor.

A consent form must be signed to take part in an activity.

Participation in the Wild Things in Captivity Project is voluntary. This includes all aspects of the project. If at any point you no longer wish to be involved in the project you can notify the Wild Things in Captivity Project team. If you wish to remove your contributed content from all Wild Things in Captivity Project platforms please visit the Bestival Science Tent during the festival and inform the team or contact the team on WildThingsinCaptivity@gmail.com.

Please note: If you submit content to the project email address that content will be processed and your email details deleted.

It is the decision of the Wild Things in Captivity Project team whether content will be added to Wild Things in Captivity Group Facebook.

Abusive/inappropriate content will not be included.

As the age of entry for social media platforms is thirteen, the Wild Things in Captivity Project team will use the UK British Board of Film Classification of 12A i.e. that any content will be appropriate to that age group and up. Parents and guardians should assess whether the content is appropriate for children under thirteen. The aim is to support the widest possible participation in the project.

The Wild Things in Captivity Project is not responsible for the content of external sites or social media platforms.

The Wild Things in Captivity Project is offered for voluntary take-up and, as such, the Wild Things in Captivity Project takes no responsibility and is not liable for any damages to persons or property through the creation of Wild Things in
Captivity content. Be safe; do not hurt yourselves or others. Be Wild Things in Captivity.

Also note the Bestival Terms and Conditions: “Bestival is for nice people and is about having a good time. Anti social behaviour will not be tolerated and you will be ejected without refund.” (http://2014.Bestival.net/info/terms-and-conditions)
Appendix D: Third Practice Project Additional Documentation

D.1 #LoveWight Concept Development

As mentioned in the main body, the original intention had been to use the Diamond Isle as the name for the project. The approach to encourage involvement was to ask people to “make a diamond”. This was changed, to tie-in with the interests of Visit Isle of Wight, to #LoveWight. At the Isle of Wight Festival this was couched around showing love for the island and at the Bestval Science Tent around the concept of “Small World Networking” (cf. Support Document 8). This encouraged the sharing of the #LoveWight.

The original idea for the hand sign shape was for a more realistic shape as show below. However, this was not very distinct and could look too much like the club from a suit of cards. The first version of the concept shown here:

D.1.1 #DiamondIsle Hand Frame

The diamond hand shape is used as a frame to take a photograph of a location/people on the Isle of Wight. Note: it is most likely that this will need two people, one to make the frame and one to take the shot.

Figure 100: The #DiamondIsle Hand Frame
D.1.2 # DiamondIsle In shot

A photograph is taken with people on the Isle of Wight in shot making the diamond shape.

![Figure 101: The #DiamondIsle in shot](image)

D.1.3 # DiamondIsle Abroad

Version 1. or version 2. is taken at other locations on the planet.

The hand sign was changed to a diamond or rhomboid shape to help keep the integrity of the image. The development of the concept was simple in terms of the symbolic and cultural connections made to hand signs as explained above. However, a degree of adaptability has had to be applied both in response to pressures both from Visit Isle of Wight and through experience prototyping, the result being a move to the #LoveWight concept as detailed in the main document.

D.2 The Evaluation Procedure

Rogers, Sharp and Preece (2011), provide a number of key questions to be answered in determining the evaluation methods to be employed, their applicability and the issues attached to each.

D.2.1 Should the data be treated statistically?

During the project 302 people contributed photographic content to the project. However, this does not constitute a substantial number compared to what may
have been possible if Visit Isle of Wight had contributed to the project. The amount of output enabled an assessment in terms of a range of forms of the #LoveWight signs with ratios of non-standard to standard signs of 1 : 3 at the Isle of Wight Festival and 1 : 4.8 at the Bestival. Furthermore, at Bestival there were a small number of additional usages and repurposing made of the content by others through @ tags and hashtags (14) and commercials associations made by individuals and companies (7). These indicated additional methods of repurposing the content. The percentage conversion rates at the two festivals were a respectable 9 : 1 (Isle of Wight Festival) and 23 : 1 (Bestival). This indicates the value of the concept to those approached face-to-face. However, the conversion rate online from numerous calls for contributions was very small indeed, given the reach for each image, post or video. Thus, the aim to encourage online contributions was not successful but the aim of creating content in situ was. Although there is a tie-in with the concept of referencing back to a real space with these findings, it is still disappointing that more online submissions were not achieved, as that content would have also referred back to a real space either on or off the Isle of Wight. Thus, the content should be treated as strongly indicative of the central premise of both participant and protagonist behaviour occurring but no more than that.

D.2.2 How to present and analyse the qualitative data?

There is a shift in the approach to the qualitative analysis as compared to the prototypes. This shift, from a social science approach to an arts practice approach, is to represent a confidence in the structure of the project to represent the developing ideas in a live creative project. Furthermore, in response to the critique of the difficulties in archiving dynamic interactive content, the use of social media platforms for the display and storage of that content means that it is available to view/critique as long as those platforms i.e. Facebook and Instagram are in existence. Content has been screen-grabbed from the platforms and is recorded and analysed in the main body of the thesis.
D.2.3 What is the reliability of the approach?

The content obtained at the festivals is of sufficient quantity to offer indications of both participant and protagonist behaviour and that the data obtained from the two events is both positive in terms of conversion rates and similar in terms of ratios of non-standard to standard forms of the #LoveWight signs. However, without the involvement of Visit Isle of Wight in terms of promoting the idea the scale of data is only indicative and, therefore, it is the case that further research is required to confirm the reliability of the approach.

D.2.4 What is its validity?

There is validity in terms of the conversion rates and in terms of the non-standard delivery of content. Furthermore, the range of repurposing both in terms of reusing and making something of the content validate, to a degree, the hypothesis that these ideas could be explored in situ. However, the limited content obtained online is not sufficient to draw any conclusions. This could be seen as validating the need for real space interventions but, given the symbolic level at which the content was being represented there was no requirement for a contributor to be on the Isle of Wight or to require a face-to-face encounter in order to supply content. In short the lack of validation from Visit Isle of Wight meant that the content had to stand by itself. The validity of the exercise has consequently been reduced because of that.

D.2.5 Are there any biases that may distort the results?

The aim of the project has been to present all information in as unbiased a manner as possible. No additional weighting was given to any content contributed online. No steering was given in terms of how contributions should be offered - beyond illustrating the standard from of the #LoveWight sign. There is the possibility that users/visitors saw previous content and sought to produce
content in the same manner. This may have happened once during the Bestival, see Figures 46 and 47, where one couple may have reproduced a previous couple stance. Furthermore, there was the close reproduction of a view of Compton Bay taken for the promotion of the project, Figures 76 and 77. However, these isolated examples do not undermine the qualities that have been witnessed through the project. The Isle of Wight Festival data capture took place at the Kashmir Café, the Isle of Wight themed zone. However, this did not skew the content gained as only one of the nine sets of contributors were from the Isle of Wight. There was the potential bias that may have occurred if collaboration had been agreed with Visit Isle of Wight in terms of the use of content. However, the use of the “non-exclusive” protocol would have meant that all content would still belong to the original contributors with rights to the other parties for promotional use.

D.2.6 Are the results generalizable, i.e., what is their scope?

Whereas the results are only strongly indicative of activities, both of participants and protagonists, the purpose of the research is to attempt to develop principles that could be applied to the development of responsive environments using digital interactive technologies. Thus, the limited success of the practice has led to a generalizable theoretical approach that can be applied in a wide range of further practical implementations. This is a product of the continued interweaving of theory and practice throughout the research, at each occasion the one informs the other. Therefore, there is considerable scope for the application of the notion of the sharing, using and making of content in and through a cybernetic system connecting practitioners, users and environments and encouraging participants and protagonists through those interactions.

D.2.7 Is the evaluation ecologically valid or is the fundamental nature of the process being changed by studying it?
The use of an arts practice approach to the study means that the aim is to intervene and create new content. The aim of the third practice project has been to offer opportunities for creative activity by users/visitors. Therefore, in terms of the concept of the representation of the Isle of Wight the aim was to affect it. However, in terms of the aim to reveal examples repurposing and thus protagonist behaviour, it is far less clear whether the study of the concept is affected by that study. The aim was to produce an unbiased approach. However, there were two instances whereby the method of capture/promotion of the concept may have encouraged a bias towards particular content. Although these instances have been acknowledged there is still sufficient evidence to that the phenomenon, of repurposing and thus an example of protagonist behaviour, does exist and is worth examining.

D.3 Practical Issues

There were issues relating to the data capture at the Isle of Wight Festival in terms of the lack of base. The data capture took place at the Kashmir Café, the Isle of Wight themed zone. As mentioned above, this did not skew the content. However, the lack of sheltered station plus the continued inclement weather reduced the amount of content gained. The station in the Bestival Science tent meant that content could be gained throughout the duration of the festival. No technical issues resulted from lack of wi-fi, the lesson having been learned from the second practice project. The only serious practical issue was the limited dissemination of content due to the lack of collaboration with Visit Isle of Wight. However, this is a matter of quantity not quality in the sense that the phenomenon of repurposing and protagonist behaviour was found present in the data.

D.4 Addressing Ethical Issues
In addition to conforming to the requirements of the Southampton University Ethics Committee’s requirements, the CARVE mnemonic protocols were used as described by Connolly et al in their *Ethics in Action: A Case-based Approach* (Connolly et al 2009). Indeed, the former were integrated into the latter.

**D.4.1 Consequences:** Promote the best possible consequence from the practice project.

**D.4.1.1 Principle of Non-Maleficence:** Do not cause unnecessary harm to the visitors.

A Terms and Conditions sheet was placed on the #LoveWight Facebook page and was available at both festivals, See Support Document 1 below. This sheet included the clause:

Participation in the #LoveWight Project is voluntary. This includes all aspects of the project. If at any point you no longer wish to be involved in the project you can notify The Love Wight Project team. If you wish to remove your contributed content please contact The Love Wight Facebook or email ProjectLoveWight@gmail.com. The activities require no personal information to be stored.

In addition, two Risk Assessments were conducted one for the #LoveWight project and one for the stall in the tent, see Support Documents 2 and 3 below.

**D.4.1.2 Principle of Positive Beneficence:** Make something that benefits the user/visitor.

The purpose of the #LoveWight project is to enable users/visitors to connect with the Isle of Wight. This concept is developed out of the limited opportunities to represent the Isle of Wight as a discrete thing. The “love” and “Wight” signs offer that means. It is a simple point but the vast majority of smiles on contributors’ faces at the two festivals indicate a sense of enjoyment at least.

**D.4.1.3 Principle of Utility:** Make something that is useful for as many users/visitors as possible.
In addressing the lack of means of representing the Isle of Wight the aim was to provide useful tools for that representation through the hand signs. This utility existed for the period of the project but has not continued under its own volition since.

D.4.2 Respect for Autonomy: respect and promote self-determination and competent persons.

There were ample opportunities shown for personal expression through the activities. Indeed, that was the point of the project: that users/visitors could decide for themselves how they interpreted the project. It was entirely voluntary with a small number of those approached; six sets, not wishing to take part. The Information Sheet, see Support Document 4 below, also reaffirms this.

D.4.3 Rights: Respect individual moral rights of users/visitors.

The Terms and Conditions includes a section on rights regarding copyright and content:

By submitting your pictures/short videos you are entering into a non-exclusive arrangement i.e. you can use the pictures/short videos in any way you wish and you are consenting that the #LoveWight Team can use the pictures for the project and publicity purposes.

The Terms and Conditions also feature a section on issues relating to Parents and guardians rights regarding content viewed/produced by their dependents:

As the age of entry for social media platforms is thirteen, the Love Wight Project team will use the UK British Board of Film Classification of 12A i.e. that any content will be appropriate to that age group and up. Parents and guardians should assess whether the #LoveWight content on their social media systems is appropriate for children under thirteen in their care.

In addition both the Terms and Conditions and the Information Sheet state that involvement in the project is voluntary and can be annulled as required:
These are voluntary activities. If you no longer wish to take part you are free to stop. Simply contact the Love Wight Facebook or email ProjectLoveWight@gmail.com and your content will be removed.

D.4.4 Virtues: Act according to good character.

It can only be stated that the research was conducted in a fair and acceptable manner.

D.4.5 Equality: Treat visitors with equal consideration and respect.

It can only be stated that the research was conducted in a fair and acceptable manner.
D.5 Support Documents

D.5.1 Support Document 1: The #LoveWight Project - Project Risk Assessments as required by the SSU Ethics Committee

Identified Risk Hijacking of the Love Wight concept
Likelihood Low
Potential Impact Damaging of The Love Wight concept

Risk Management

All content within the system is filtered by a gatekeeper in the team and must conform to the Terms and Conditions. Therefore, there will be no detrimental content within the system. It is possible for people to create and post content outside the system that attacks or “trolls” the content in the system. The Terms and Conditions specifically state that: “The Love Wight Project is not responsible for the content of external sites or social media platforms” i.e. that such content is outside the compass of the team’s control. If the amount of the negative content outside the system reaches a scale that threatens the validity of the project then it may be necessary to pull the project to limit such damage. The team will be carefully monitoring the reception of the concept and thus will be in a strong position if such a decision has to be made.

Identified Risk Hacking of the Love Wight concept
Likelihood Low
Potential Impact Damaging of The Love Wight concept

Risk Management

All content within the system is filtered by a gatekeeper in the team and must conform to the Terms and Conditions. Therefore, there will be no detrimental content within the system. However, if one or more platforms are hacked then offensive or other content could be added to the site. In such cases the policy is to delete this content and liaise with the platform proprietors to remove the hacker. If this cannot be achieved in short measure and such negative content continues to be uploaded then that platform will be deleted to minimise offence. The team will be carefully monitoring the content of the platforms and thus will be in a strong position if such a decision has to be made.

Identified Risk Trolling of content in the Love Wight concept
Likelihood Low

Risk Management

There will be three layers of gatekeeping in force during the project.
1. The Instagram terms and conditions that rule out trolling and abuse in pictures, comments and hashtags: https://help.instagram.com/478745558852511
2. The terms and conditions of the Visit Isle of Wight website: http://www.visitisleofwight.co.uk/information/terms-and-conditions
3. The terms and conditions prominently displayed on the Love Wight Project Facebook cf. Love Wight Terms and Conditions.

If any trolling of content that has previously been accepted as *bone fide* occurs then that content will be removed from the Love Wight Project Instagram and Facebook. Any parent who is not happy with the content submitted by their child or any responses by others to that content, can contact the Project through the email supplied: projectlovewight@gmail.com or the Love Wight Facebook and the content will be removed. This option is also available to any adults who no longer wish their contact to be included in the project. N.B. the same effect can be achieved by the person either by deleting the photograph or removing the #LoveWight hashtag.

Russell Richards MA

10.06.2015
D.5.2 Support Document 2: Bestival Tent Risk Assessments

**Identified Risk** Trip Hazards  
**Likelihood** Low  
**Potential Impact** Physical injury to the public  
**Risk Management**

Some cables will be used for the following equipment:

- Laptop
- Mini-data Projector
- Tablet
- Wi-fi extender

However, these cables will be positioned to avoid any trip hazards for the public.

**Identified Risk** Electrical Equipment  
**Likelihood** Low  
**Potential Impact** Electric Shock injury to the public  
**Risk Management**

The following electrical equipment will be used:

- Laptop
- Mini-data Projector
- Tablet
- Wi-fi extender

However, the equipment will only be used by the exhibitors and, therefore, constitutes no risk to the public.

**Identified Risk** Line of Sight Issues from Mini-Data Projector  
**Likelihood** Low  
**Potential Impact** Eye injury to the public  
**Risk Management**

There is the risk of eye damage from data projectors. However, the mini-data projector will position to avoid any line of sight issues.

**Identified Risk** Presentation Board Integrity  
**Likelihood** Low  
**Potential Impact** Injury to the public  
**Risk Management**
A presentation board is to be used to display poster relating to the event. This will be secured to avoid any risk to the public.

Russell Richards MA
#LoveWight Exhibitor

Bestival Science Tent 2015
D.5.3 Support Document 3: Terms and Conditions as required by the SSU Ethics Committee

To contribute to the LoveWight2015 Facebook, the Love_Wight Instagram or @LoveWight2015 Twitter take a picture/short video with you and/or your friends making the Love Wight signs and use the hashtag #LoveWight. Use other hashtags to say why you love the Isle of Wight. The #LoveWight team will select pictures to be used as part of the project as long as they abide by the Terms and Conditions. The use of the #LoveWight hashtag means that the contributor abides by the Terms and Conditions. The #LoveWight project will use the chosen photographs/short videos on the #LoveWight Instagram and Facebook.

A selection of photographs/videos will be used to make a film of the contributions. This content will be collected during Bestival September 2015. A model consent form to be filled in for this activity. This film will be displayed at Bestival Science Tent at the festival and on the Love Wight Facebook.

By submitting your pictures/short videos you are entering into a non-exclusive arrangement i.e. you can use the pictures/short videos in any way you wish and you are consenting that the #LoveWight Team can use the pictures for the project and publicity purposes.

Participation in the #LoveWight Project is voluntary. This includes all aspects of the project. If at any point you no longer wish to be involved in the project you can notify The Love Wight Project team. If you wish to remove your contributed content please contact The Love Wight Facebook or email ProjectLoveWight@gmail.com. The activities require no personal information to be stored.

By submitting photographs/short videos to the #LoveWight Project call you are agreeing to abide by these Term and Conditions.

It is the decision of the Love Wight Project team whether content will be added to the #LoveWight Instagram, #LoveWight Twitter or the #LoveWight Facebook. Abusive/ inappropriate/ obscene content will not be included.

As the age of entry for social media platforms is thirteen, the Love Wight Project team will use the UK British Board of Film Classification of 12A i.e. that any content will be appropriate to that age group and up. Parents and guardians should assess whether the #LoveWight content on their social media systems is appropriate for children under thirteen in their care. Parents and guardians take responsibility for pictures/short videos submitted of children under thirteen in their care. The aim is to support the widest possible participation in the project. Those people between thirteen and eighteen should get permission from their parents in order to take part in the Project. Any parent who is not happy with the content submitted by their child or any responses by others to that content, can contact the Project through the email supplied: projectlovewight@gmail.com or the LoveWight2015 Facebook and the content will be removed. This option is also available to any adults who no longer wish their contact to be included in the project. N.B. The same effect can be achieved either by deleting the photograph or removing the #LoveWight hashtag.

The #LoveWight Project is not responsible for the content of external sites or social media platforms.

The #LoveWight Project is offered for voluntary take-up and, as such, the #LoveWight Project team takes no responsibility and is not liable for any damages to persons or property through the creation of the #LoveWight content.
Research Project Title: The #LoveWight Project

Introduction

My name is Russell Richards and I am researching responsive environments for my PhD research at Southampton Solent University. I would like to invite you to participate in this research project.

You should only participate if you would like to. Choosing not to take part will not disadvantage you in any way.

Before you decide to take part, it is important that you understand why the research is being done and what your participation will involve. Please take time to read the following, contact me if anything is not clear or if you would like more information at www.facebook.com/LoveWight2015 or ProjectLoveWight@gmail.com

Research aims

I am conducting a series of experiments to see how peoples’ relationships with an environment can be affected through the use of digital technologies.

Research method

I will use two practical activities to investigate the aim (this will be used subject to the Terms and Conditions):

1. You are invited to take part in a video that will be displayed at Bestival Science Tent during the festival. As many pictures as possible will be featured in the video also to be displayed on the Love Wight Facebook and Love Wight Twitter. The aim is to show the connection people have with the Isle of Wight whether they live on the Isle of Wight, are visiting the Island or are living abroad.

2. You are invited to spread the word regarding #LoveWight.

3. You are invited to submit photographs/short videos on Instagram, Facebook or Twitter featuring you making the love hand sign and the new diamond sign i.e. the Isle of Wight. Use the hashtag #LoveWight and do not forget to add other hashtags to show why you love the Isle of Wight.

* These photographs will illustrate the connection people have with the Isle of Wight whether they live on the Isle of Wight, are visiting the Island or are living abroad.

* You take your photograph anywhere and for whatever reason but, as stated in the Terms and Conditions, it is your responsibility to make sure you and others are safe when you do so.

* The photographs will be displayed on Love_Wight Instagram if they satisfy the Terms and Conditions.

Who I have asked to participate?

People can participate whether they are on the Isle of Wight or abroad. Terms and Conditions are available at:www.facebook.com/LoveWight2015

Location of research

The location is anywhere that you would like to form a love hand sign and the diamond sign and show your connection to the Isle of Wight, either on the Isle of Wight or abroad.

Duration of the research

The research will take place from Friday 12th June 2015 to 1st November 2015.

What does the research entail?

You will take an Instagram or Facebook picture/short video of you forming the love hand sign and the diamond hand sign. Make sure you hashtag your picture/short video #LoveWight and add other hashtags that explain why you love the Isle of Wight. Post it to the Love Wight Facebook
site. It will be accepted as long as it abides by the Terms and Conditions. I will then be able to assess the types of content produced.

Are there any risks involved in participating?

The risks are involved are minimal. As stated in the Terms and Conditions it is your responsibility to make sure that you and others are safe when you take the Love Wight Instagram pictures/short videos. These are voluntary activities. If you no longer wish to take part you are free to stop. Simply contact the Love Wight Facebook or email ProjectLoveWight@gmail.com and your content will be removed.

Confidentiality

Your pictures will remain yours to use as you please as stated in the Terms and Conditions. The location of the picture will only be used if you included it with your picture.

Direct quotes from the hashtags may be used in the final outcome. If they are they will be anonymised, no names will be used.

What if the participant has questions about the Research Project?

If you have any questions about this study please contact the Love Wight Facebook or email: ProjectLoveWight@gmail.com

www.facebook.com/LoveWight2015        Instagram/Love_Wight
www.twitter.com/LoveWight2015
Russell Richards from the School of Media Arts and Technology at Southampton Solent University wishes to take photographs or video film for research or publicity purposes. These images may appear in research papers or our printed publications, on a website, or both. Before taking any pictures, we need your permission. Please answer questions 1 and 2 below, then sign and date the form where shown.

Please choose Yes or No.

1. May I use your image(s) for the #LoveWight Instagram, Facebook, Twitter and video project for my PhD research at Southampton Solent University? This will be published in online.
   Yes / No

2. May I use your image(s) in research documentation produced as part of my PhD research at Southampton Solent University? This may be published in hard copy or online.
   Yes / No

Please note that websites can be viewed throughout the world, not just in the United Kingdom where UK law applies.

Signature: ...............................................................

Your Chosen Instagram Hashtag/s: ............................................................

Date: ............................................................

Please print your name in capitals: ............................................................

FOR SOUTHAMPTON SOLENT UNIVERSITY USE
Signed on behalf of Southampton Solent University: .....................
Name: ...............Russell Richards MA........................................
Job title: ........Senior Lecturer in Music, Media and Visual Arts.............
Event and location: The Bestival, Robin Hill, Isle of Wight
Photographer's name: .......Russell Richards.........................
Photographer's contact details: .....Russell.Richards@solent.ac.uk........................
Southampton Solent University, East Park Terrace, Southampton SO14 0YN

D.5.5 Support Document 5: Model Consent Form used as required by SSU Ethics Committee
The #LoveWight Project: Show your connection to the Island. Share it too.

The #LoveWight How To

* Like our Facebook.com/LoveWight2015 (Read the T&Cs and Info Notes)
* Follow our Instagram.com/Love_Wight
* Follow on Twitter.com/LoveWight2015

1. Take a picture/short video using the love + Wight hand signs. You can be on the Island or abroad.

2. Post to our Instagram, Facebook or Twitter. Use the tags #LoveWight and #Lovethe… e.g. #Lovethedinosaurs

3. Include your location whether you are on the Island or abroad.

4. Share your picture and the LoveWight Facebook page with your friends.

#LoveWight
D.5.7 Support Document 7: #LoveWight Display Board for Bestival

‘Small-world’ Networking

Why is this important?
People who are just acquaintances or that you just bump into are still better sources of information than your friends because they know so many people you don’t know.


‘Small-world’ Network Examples
Power Grids
Neurones
Kevin Bacon (In fact, Rod Steiger, Christopher Lee, Donald Pleasance and many others do better)
All use ‘small-world’ networks:
Clusters with single leaps to other networks

This works for both getting information and sharing it too.

ProTip: Use LinkedIn
To find out about people you don’t know and, maybe, connect with people you do know.
Bibliography


BALE, G., 2015. Gareth Bale heart sign. [viewed 15 November 2015]. Available from:


http://brightondigitalfestival.co.uk/


COOK, P. 2011. The 50 Greatest Matte Paintings Of All Time. [viewed 15 August 2016]. Available from:


http://artintelligence.net/review/?p=818


CROFTS, C., 2012a. Technologies of seeing the past the Curzon Memories app. [viewed 15 March 2012]. Available from:
http://www.academia.edu/528655/Technologies_of_Seeing_the_Past_The_Curzon_Memories_App


CROFTS, C., 2012c. Meeting with Whiteladies Picture House campaigner. [viewed 15 February 2013]. Available from:
http://www.react-hub.org.uk/blog/meeting-whiteladies-picture-house-campaigner


CROFTS, C., 2015. Curzon Memories app support page. [viewed 15 December 2015]. Available from:
http://www.eyefullproductions.co.uk/curzon/about.html


http://www.columbiamedicinemagazine.org/letters/fall-2013/letters


DMRC, 2016. Digital Media Research Centre, Queensland University of Technology. [viewed 28 December 2015]. Available from:
https://www.qut.edu.au/research/our-research/institutes-centres-and-research-groups/digital-media-research-centre/about

290


FAULKNER, M., 2006. VJ: audio-visual art and VJ culture. London: Lawrence King


FRITH, J., 2012. Constructing location, one check-in at a time: examining the practices of Foursquare users. Doctoral Dissertation, North Carolina State University, Raleigh, NC


GOOGLE SCHOLAR, 2015a. *Imagined Communities* citations. [viewed 15 February 2015]. Available from: https://scholar.google.co.uk/scholar?hl=en&as_sdt=0,5&q=%22Imagined+communities%22


HUYBRECHTS, L., ed. 2013. Participation is Risky: Approaches to Joint Creative Processes. Antennae Series No. 10. Amsterdam: Valiz

ISLE OF WIGHT STATISTICS, 2015. Visit Isle of Wight statistics 14th July - 31st


https://www.media.mit.edu/research/groups/responsive-environments


NASTASI, A., 2012. 10 playful public works of art. In Flavourwire. 13 September 2012 [viewed 13 December 2015]. Available from:
http://flavorwire.com/328208/10-playful-public-works-of-art


https://www.nngroup.com/articles/personalization-is-over-rated/


http://archive.turbulence.org/blog/tags/locative-media/


PANGARO, P., 2010. How can I put that? applying cybernetics to “conversational media”. Cybernetics and Human Knowing, 17(1-2), 59-75


RAINER et al, eds. 2009. See this sound: The Promise of Sound and Vision. Linz: Lentos


304


SMASHING MAGAZINE, 2012. What is user experience design? [viewed 28 July 2012]. Available from:
http://uxdesign.smashingmagazine.com/2010/10/05/what-is-user-experience-design-overview-tools-and-resources/


THE TERMINATOR, 1984 [Film]. Directed by James Cameron. USA: Cinema '84 Pacific Western
TRIPADVISOR, 2016. Tourism experience review website. [viewed 28 February 2016]. Available from: https://www.tripadvisor.co.uk/
V&A. 2013. Victoria & Albert Museum. Museum and Schools Section. [viewed 12 March 2013]. Available from: http://www.vam.ac.uk/content/articles/m/schools/
VANEGAS, C. A. et al., 2009. Interactive design of urban spaces using geometrical and behavioral modeling. ACM Transactions on Graphics (TOG) - Proceedings of ACM SIGGRAPH Asia 2009, 28 (5), Article 111


WODAK, J., 2010. Interrogating Interactive Interfaces: On balance in the evocation of environmental responsibility in the creation of Responsive
