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Music

Building Stories:

What Can Heritage Professionals Learn from Open World Games?

by

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ABSTRACT

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Abstract

What can real-world cultural heritage sites learn from the video games industry about presenting a coherent story, while giving visitors freedom to explore and allowing them to become participants in the story-making? How do cultural heritage professionals have to change their storytelling practices to properly take advantage of new digital technologies? A review of the literature, including analysing the narrative of three "open world" style video games shows that cultural heritage sites manage to provide analogues of many ludic emotional triggers except one – story.

The bulk of the work is auto-ethnographical: how might cultural heritage professionals, like me, translate linear interpretations such as histories, guidebooks, exhibition texts and other sources, into a network of narrative atoms (natoms) that an algorithm, rather than a human, might deliver to visitors? What should they consider along the way? The first prototype was a responsive heritage narrative, this was an on-screen text "adventure" rather than a real-world environment. Taking learning from that experiment to Chawton House Library, an on-line data-base of natoms was built, which included environmental effects such as lighting, sound and music. Visitors participated in an "Untour" simulating a responsive environment, triggered by their movement around the spaces of the house. The output of this research is an analysis of the recordings and observations made during the Untours, which proves that it is possible to author coherent narratives by tagging individual natoms. However consideration should be given to the transitions between natoms, and heritage professionals should be challenged to take more risks with fiction.

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Academic Thesis: Declaration Of Authorship

I, Matthew Tyler-Jones

declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

Building Stories: What Can Heritage Professionals Learn from Open World Games?

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signed: .....

Date: .....

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Also managers, staff and volunteers at University of York; Heritage Jam; Splash and Ripple; The Holburne Museum; Bodiam Castle and Chawton House Library.

Definitions and Abbreviations

Ambient interpretation – cultural heritage interpretation that is ignorable, affective, specific to the place and persistent, after M. Eyles (2012, p. 109)

Heritage interpretation - an "activity which aims to reveal meanings and relationships though the use of original objects, by first hand experience and by illustrative media, rather than simply to communicate factual information." (Tilden, 1977, p. 8)

Hypertext - a software system allowing extensive cross-referencing between related sections of text and associated media

Kernel – elements of a narrative that cannot be removed, reordered or replaced without substantially altering it (Shires & Cohan, 1988, p. 55)

Natom – the smallest unit of a narrative "small atomic pieces of narrative that cannot be further broken down by a given system and still make sense" (Hargood, 2011, p. 42). See also:

P-natom – a persistent natom, a space or object that forms part of the narrative in interpretation

E-natom – an ephemeral natom, part of the narrative that is delivered through non-permanent media

Satellites – elements of the narrative that can be omitted, reordered or replaced (Shires & Cohan, 1988, p. 54)

Chapter 1: Introduction

In the last decade, computer-based adventure games like *Red Dead Redemption* (Rockstar, 2011) have achieved emotionally engaging stories in an "open world" virtual environment where the player is not forced to follow the story on rails, like a passenger on a roller coaster. Such games have become a more mainstream medium, no longer ephemeral, with narratives that are reviewed and criticised.

What can real-world cultural heritage sites learn from the video games industry about presenting a coherent story, while giving visitors freedom to explore and allowing them to become participants in the story making? What can curators (and other heritage interpretation professionals) learn from games about structuring procedural stories for both meaning and emotional impact?

My intention is to discover what cultural heritage institutions could learn from games developers about narrative, and whether the way story is applied to the virtual spaces of games has any relevance to telling stories in the three-dimensional spaces of the real world. Stories have so much more power than mere historical fact, as Polletta, Trigoso, Adams, and Ebner (2013) acknowledge:

> Preachers, advertising executives and politicians have long attested to the power of a good story to change people's minds. Communication scholars recently have shown why. People cognitively process stories differently than they process other kinds of messages [...] people process stories by immersing themselves in the story, striving to experience vicariously the events and emotions that the protagonists do. (Polletta et al., 2013, p. 291)

Storytelling is part of human culture, an age-old way of passing on learning. But how we understand stories is itself a complex study. Alleyne (2015) attempts to answer the "What is narrative?" question:

> Narrative, in its simplest sense, consists of a series of connected events, and a particular way in which these events are told. The first element is the story, and the second element is the narrative discourse… It follows from this that a story can be rendered through different narrative discourses […] The narrative mode of cognition is one which organises ideas and experiences into stories and is seen to contrast with the paradigmatic, scientific mode in that it operates in an emotive or

> emotional and expressive register as opposed to the rational register of paradigmatic cognition. (Alleyne, 2015, p. 40)

Can it be therefore argued that a label in a museum or cultural heritage site, which categorizes an object, can't connect the visitor emotionally to that object, unless they bring a story with them? But equally, can a purely story-led interpretation of a site or collection possibly help the visitor understand it?

Freeman Tilden (1977, p. 8) defines interpretation as an "activity which aims to reveal meanings and relationships though the use of original objects, by first hand experience and by illustrative media, rather than simply to communicate factual information." But what transforms facts into interpretation? Two of the Generic Learning Outcomes (MLA, 2008) commissioned by re:source (now a function of the Arts Council) back in 2002, refer to emotional engagement: the Attitude and Values outcome includes "feelings" and "empathy"; and the Enjoyment Inspiration Creativity outcome includes "having fun", "being surprised" and "being inspired".

1.1 Research question and methodology

This thesis addresses the question "how do cultural heritage professionals have to change their storytelling practices to properly take advantage of the new digital technologies for an interactive, personalised, future heritage experience?" By "heritage professionals" I refer specifically to those involved in the production of heritage interpretation. This most obviously includes curators but will also include interpretation and communication specialists, docents, marketing professionals, community and learning officers and leaders of projects or programmes working with specific audiences. Many will work directly for the site or collection but there will also be others - exhibition designers, writers, and artists, for example - contracted by the site or organisation for a specific project.

There will still be a role for heritage professionals of this sort in the future of automated content delivery. Ardito, Buono, Desolda, and Matera (2018) look forward to a time when the creation of digital content "does not require IoT-related technical knowledge." When interactive systems are no-longer prototypes, have shared operating and data standards and, importantly, are cost effective enough to be considered by most heritage organisations, what will heritage professionals like me, with responsibility for creating or at least directing interpretation, have to consider when creating content?

My methodology was, first of all, to "read" other successful interactive narratives, those games in which the player explores a space and uncovers, or even through their choices, makes, a narrative. Looking at these with a heritage storyteller's eye, I sought to understand the features in those games that impact the player's engagement with the story. I also took the opportunity to learn what I could about two ludic interpretation installations created for heritage sites by the company Splash and Ripple. This and some other audience research convinced me that the "ludic" approach - specifically gamifying interpretation, does not currently appeal to wide enough audiences. So further work concentrated on the specifics of the text. I intended to take the sort of content that exists for a reasonably well researched site and collection, and apply it to a hypothetical interactive system, noting the choices that the visitors make and what impact those choices have on the narrative.

An initial opportunity was presented by the Heritage Jam competition in 2015 (Heritage Jam, 2015), which allowed me to create *A Walk Among the Ruins*. Borrowing the "jam" concept from previous game prototyping events, Heritage Jam was conceived as an event which would bring together people of all sorts of background, including game designers and heritage professionals, to create and prototype responses to heritage that were often digital and ludic. Each Jam was in reality two connected events: one online during which individuals and teams had a month to create a project; and at the end of the month, an in-person event, in 2015 at the University of York, where team are put together to create something from scratch in 48 hours or less. I participated in both events, but it was it was my entry for the on-line jam that offers illumination upon my further work and particularly in my conclusions.

Following on from the success of that virtual interactive experiment, I wanted to explore how visitors might access a narrative simply by walking around a physical space, and analyse the visitor's responses to the story choices offered. Like many heritage professionals in my position, I had to prototype this with an analogue, not digital, method. I am not a software engineer and my research question does not involve researching a digital solution for delivering interpretation to heritage visitors. I do discuss some of those systems, for example, (Not & Petrelli, 2018), in Chapter 2, but apart from noting some advantages and features which I think are useful to heritage professionals, and some limitations, I do not analyse them in great detail. Neither do I propose an algorithm for the creation of interactive content, although I did keep the idea of pseudo-algorithmic decision making in mind in my methodology.

So my plan was to use humans, one to follow the visitors around and read from a visitor-action triggered script, and another to follow the visitors and the guide around and video record the visitor's behaviour and the guide's responses for later analysis. I recruited a number of volunteers, but none felt confident with reading delivering the procedural script, so I became the "un-guide" and the volunteers took on the role of observer. Though I said that I was not looking to discover an algorithm for interactive interpretation, I planned to force myself to write, and then present, algorithmically, or at least pseudo-algorithmically. *A Walk Among the Ruins* was a basic program, but it ran independently. Having written it, I could not intervene. The *Chawton Untours* on the other hand, were going to be presented by myself, an experienced tour guide who, if I let myself, could change what I said to better meet the visitor's needs. I had to discipline myself to read only from the prepared script. Importantly I had to write into that script basic Event-Condition-Action (ECA) rules (Ardito et al., 2018) instructing me what to do in response to the visitor' .

Over the course of my research, it became apparent that the methodology might best be described as auto-ethnographical. This may not be a good thing. Prasad (2019, p. 4) points out that "Critics of autoethnography have viewed the method as lacking rigor and being too artful, and have accused those who adopt it of engaging in self-indulgence and intellectual masturbation." More positively Ellis, Adams, and Bochner (2011) define autoethnography as "an approach to research and writing that seeks to describe and systematically analyze (graphy) personal experience (auto) in order to understand cultural experience (ethno)." It is a method that has been applied to sociological studies (Prasad, 2019) (Wall, 2008), but also music (Born, 1995) and heritage (Grist, 2013). It may well seem artful and self-indulgent but coming from a long career within the sector I am convinced it has value for heritage professionals like me.

1.2 Navigating this thesis

Emotional engagement is the theme, the golden thread, running through all three avenues of research that my literature review explores over the next two chapters: interpretive technology; digital storytelling; and, narrative structure. In Chapter 2, I will explore the literature on interpretive technologies in museums and other heritage sites, including how professionals write about planning exhibitions. We start of course with the father of interpretation, US National Park ranger, Freeman Tilden. His seminal work *Interpreting Our Heritage* (Tilden, 1977) has long been a foundation for the interpretation profession. But I will also

explore a more recent rebuttal of Tilden's foundational principles - Staiff (2014) argues for a more post-modern, audience first, approach to interpretation.

But when we get to practical storytelling advice for cultural heritage sites we see a preference for hierarchical sequences of events, which results from a long history as reference repositories for auto-didacts rather than storytelling places. Thematic gallery arrangements, set-design and a focus on thresholds are among the basic narrative tools used (not forgetting good old-fashioned labels and introductory videos, of course). I will briefly debate the idea of learning styles, but again and again we will return to the use of sequential structures, which I believe disregards the way people move about cultural sites, even museums, where movement is more easily controlled than at other types of site.

I will also look more closely at the literature on emotion in cultural heritage. Of particular interest is the concept of "numen", an idea to which we will find ourselves returning. In Chapter 2 I also explore the concept of numen as cultural presence in religious buildings, virtual worlds and in living-history spaces. We look at some of the digital experiments that museums and cultural heritage sites are using to engage visitors' emotions.

However, while this work at first seems quite ambitious, it resorts to quite simplistic definitions of emotion because (as we will discover) the science of emotions is hard. One of our guides on this exploration of emotion is William Reddy (Reddy) who demonstrates that emotions are hard to define, to report, and to measure. But we will also see that even recent work from large international cultural heritage projects avoids the quagmire of the science of affect.

In contrast it seems the games industry, where huge amounts of money can be risked on the development of a game, are more cavalier in their approach to emotional science. We will examine some of that work which is in the public domain (games companies generally keep their research close to their chests) and particularly compare the "affordances", the emotional triggers they use, with analogues in cultural heritage interpretation.

I will describe a model of affect and affordances, not to be the definitive word on the matter, but rather to classify the affordances used in games, and seek equivalents in cultural heritage interpretation. The gaps we find in that analysis are interesting, starting with the impact of feedback to players in games. Games rely on giving various sorts of feedback to their players, but cultural heritage generally has a one-way, top-down conversation with its visitors. One important concept to come out of this reading is the idea of "ambient gaming" (defined in

detail in section 2.4.7) which in turn suggests “ambient interpretation.” This, along with “numen” will inform the experiment detailed in Chapter 4.

Speaking of numen, what feedback in games does is work alongside a degree of narrative control to make the story an incredibly personal experience for each player. While there have been some experiments in tailoring a more personal experience for heritage visitors, there is very little personalisation available for the general audience.

Figure 1 An example of a form of personalisation in general use: frames from a pre-visit video to the Van Gogh museum

Guided tours often offer a more personal cultural heritage experience. A good paid or volunteer guide can weave a compelling story as they escort you around the place. They can reveal things you might otherwise have missed. They can respond to your interests, and level of expertise, to give you a tailored experience. The only problem with guided tours is that there aren’t enough of them. People, even volunteers, are an expensive resource, and so only the smallest places can afford to give every visitor a guided tour experience. Individuals or families have to book on to a tour, joining other people who they don’t know, and whose interests they don’t necessarily share. The guided tour

experience gets diluted, less personal, less tailored to your interests. And you realise that the VERY best historic house experience would be to have the guide all to yourself. Technological solutions to this issue have been around for decades. First of all, with recorded audio-guides, which people soon realised were not at all tailored, but a single script, a single story that everybody heard, albeit they could start and stop it at their own pace.

Such guides did bring into cultural heritage spaces a seldom heard medium – music. Often absent from museums and heritage spaces, except on headphones, it's perhaps not surprising that games have been more experimental and use it to better emotional effect. In Section 2.4.8 I explore how the use of music in games, developed from similar needs and with similar results, to the use of music in film, and how, more recently, game music has become more interactive, taking advantage of what new digital media allows.

This makes it even more surprising that the storytelling techniques in cultural heritage have not changed more in recent decades. A communication revolution is taking place. You could argue it started in the 1970's when affordable photocopying gave rise to fanzines infused with a punk aesthetic, and for the first time the person in the street could publish their opinions without the need for a wealthy backer to pay for the printing presses. You might say it went digital in the 1990's when the bulletin boards and Usenet groups of the early internet allowed people to share their interests without even the cost of photocopying - as long as they had a bit of time at the university library's computers. You'd possibly be more convincing if you suggested it really started with the creation of the World Wide Web, and the rise of cheap dial-up data connections, or maybe it came with Web 2.0 and user-generated content. But whenever it launched, it reached escape velocity around 2007, when mobile devices that could access and publish everything that had come before, and affordable mobile data and home broadband all converged.

When I started this research, I and others, for example (Economou & Meintani, 2011) thought that the proliferation of such devices might provoke a massive change in the way that cultural heritage institutions tell their stories. I was convinced that, with almost every visitor bringing a personal powerful multimedia computer to the site, new paradigms would emerge for telling and creating powerful new stories through games. I'm not sure that's what we have actually seen. Where digital devices are used, it's to recreate storytelling paradigms of the last century - audio guides became more interactive, allowing the visitor to access deeper levels of information. Now many historic places offer multimedia guides,

using mobile technology with screens, made interactive with swipes and touches, NFC, Bluetooth LE beacons, or even image recognition and augmented reality. All this has served to do is put text labels in the palm of your hand rather than on the wall.

I will survey some examples of both experimental and fully-released smartphone solutions, but also argue that there is little evidence that people actually want to use their smart-phones during cultural heritage visits, and when they do, it's to access social media, not necessarily content created by, or for, the site. I found further evidence of that in some preparatory survey research which is summarised in Tyler-Jones (2018).

I conclude Chapter 2 by arguing that the development of narrative in cultural heritage has not progressed much over the last few decades. Narratives remain linear, despite visitors resolutely choosing not to read every panel, or even follow proscribed routes around a site. I return to Staiff's challenge (Staiff, 2014), and argue that the sector has so far failed to meet that challenge for what Staiff calls "emotional and serendipitous" interpretation. I argue that games create numinous experiences for players, and the museums and cultural heritage sites can learn from the way games tell stories (let's call it "ludic narratives") to encourage more numinous experiences in cultural heritage.

Chapter 3 explores some ludic narratives in detail. Interactive storytelling has a history too. Laurence Sterne created one of the first stories that, while able to be reproduced so that many readers could read the same story, was interactive, so that each reader's experience of the story was unique. *Tristram Shandy* is an epistolary novel, but it's more than that - sampling other works of literature to bring new meanings. For the first printing, Stern chose the format, paper, type and layout of the novel, with the readers' experience in mind. It's a book to be **played** with.

Perhaps the most famous interactive stories in print were the *Fighting Fantasy* series of role-playing game books, which started with *The Warlock of Firetop Mountain* published in 1982. By no means the first such game book, the series followed Bantam's *Choose Your Own Adventure* books, and solo adventures for the pen and paper role playing game, *Tunnels and Trolls* (Appelcline, 2013). These in turn may well have been inspired by the first interactive text game, *Adventure*, created in 1977 (Juul, 2001).

The first computer game is accepted to be *Spacewar!* developed at MIT in 1962, which wasn't written as much as programmed, any "story" that came from that

was in the mind of the player. But *Adventure*, fifteen years later, was a different beast, the program's "interface" consisted of simple sentences typed by the player and a database of prewritten response paragraphs, some of which including adaptable elements which changed according to the player character's location, status and previous actions. Given the textual simplicity required to build parse the language with responses, all manually coded, no one can claim that *Adventure* was high literature. Although *Choose Your Own Adventure* and *Fighting Fantasy* didn't have the same digital restrictions upon their writing, neither could they be considered a literary work, like that of Sterne. Nonetheless, games and story have always been interlinked.

However, Chapter 3 starts with a debate – should games even be read as narrative at all? Or are they an entirely different medium? This does highlight a difference between those games which are purely procedural – that is to say the only "scripts" are algorithms – and more scripted games, with characters, dramatised cut-scenes, and a cinematic structure. As I will explain, the three games that I will be looking at are of the second type.

I also look at what is claimed to be the first rigorous theory of new media, by Lev Manovich (2001). Of particular interest is the idea of spatial montage. Manovich argues this idea is not new, and of course I acknowledge that museum curators already use spatial montage techniques in exhibitions. But as we shall discover in the pre-digital age, spatial montages often made use of what the sector now calls interpreters or docents to actually tell the story. Spatial montage narratives, the literature suggests, are by their nature performative.

We also look at Csikszentmihalyi's concept of flow (Nakamura & Csikszentmihalyi, 2002), in both games and cultural heritage, noting how it is more difficult to create the conditions for flow in the latter, because visitors come to heritage sites with a far broader range of motivations. The discussion of flow returns to the idea of player as performer in the narrative.

I started this research because I had heard people speak and write positively of how modern, open-world games tackle that very problem, letting the player make their own choices, and yet still provide an engaging story. There was one problem: I hadn't played a digital game since my early teens, when pen and paper, table-top games excited my attention. If I was to understand how they tell stories I needed to experience their storytelling for myself. I chose three games, *Red Dead Redemption* (Rockstar, 2011); *Skyrim* (Bethesda Game Studios, 2011); and *Dear Esther* (the chinese room & Briscoe, 2013), each with a reputation for

emotionally engaging their players. All were scripted, rather than purely procedural, and all "open world" narratives - where the player can wander (theoretically) anywhere, but each takes a distinct narrative approach. For each game, I describe the experience of playing it, and attempt to map out the narrative.

A key observation which comes out of playing these games is the different way that each copes with a phenomenon called narrative paradox (Aylett, 2000; Louchart & Aylett, 2003). Subsequently I explore this phenomenon in more detail, and the impact that it has on the emotional arc of story. I also show how, with common interpretive design techniques, cultural heritage sites fall prey to the same narrative paradox. I explore a number of ways that digital media tries to mitigate the impact of the paradox and introduce the concept of the narrative atom, or "natom" (Hargood, Millard, & Weal, 2008). I also explore a theory of narrative which, although not written with interactive stories in mind, offers a potential way of classifying and organising these natoms.

Having so far discussed stories in imaginary, virtual worlds, I return to the real world to discuss narrative structure in location-aware hypermedia. This introduces us to the concept of sculptural hypertext, and of particular interest, narrative structures called canyons, deltas and plains, each one of which is demonstrated in each of the three games I examined earlier in the chapter. In one of the locatative games, the structure is like that of *Red Dead Redemption* – where users are rewarded for revisiting locations that they have already been to, with new natoms. However, I question whether cultural heritage visitors will be as willing to do this as gamers. The other gap I see, which is a common thread, is a lack of consideration of the emotional impact of each natom.

To fill in that missing piece of the puzzle I turned to another game designer, Robin D. Laws (Laws, 2010, 2017). Laws introduces us to his system of mapping a story's narrative beats and transitions, which I use in Chapter 4 to record and classify the sort of stories that procedurally generated tours might offer.

Chapter 3 continues with a summation of what I think a good digital cultural heritage narrative should offer in order to be emotionally engaging. It needs to be personalised, it should strive to be numinous, it could arguably be ambient. These three principles lead to a new "great desideratum"– a responsive environment. I conclude the chapter with a description of what this might feel like for visitors. However, a lot of work, and experimentation is required before a truly responsive cultural heritage environment can be achieved. I begin Chapter 4 with an evaluation of two attempts at telling game stories in the context of a day-to-

day heritage visit. The first, *Ghosts in the Garden* (Poole, 2018) used primary source material based on court records to create a choose-your-own-adventure style game around Bath's historic Pleasure Grounds. The second, created by the same company for the National Trust at Bodiam, has story less grounded in historical fact. The success of both games however was limited, and I try to understand why. Using data from two surveys that I conducted with visitors to Bath and Bodiam, I discuss the futility of trying to gamify the visit for the general visitors.

There is still value, however, in considering how games tell stories in space. The bulk of the work is auto-ethnographical how might cultural heritage professionals, like me, translate linear interpretations such as histories, guidebooks, exhibition texts and other sources, into a network of natoms that an algorithm, rather than a human, might deliver to visitors? What should they consider along the way? I will describe my first attempt at creating a procedural narrative out of historical fact. Not designed to be tested in the field, this narrative was based on a real historic site – the National Trust's Clandon Park - which had recently closed after a destructive fire. My prototyped narrative uses much of what I learned from the literature review and from the three games I played in Chapter 3, especially *Dear Esther*. It uses the text adventure language Twine, and because I also wanted to experiment with using music creatively, used an open-source script to add two sound files to the experience.

The Clandon project was not a public experiment, although it was evaluated by peer review. A real test of this method of scripting narratives needs to involve the public, not just cultural heritage professionals and academics. So the bulk of Chapter 4 describes another experiment, this one at Chawton House library. I first discuss a previous experiment at Chawton House, how it informs mine, and why Chawton is a particularly good venue for such experiments. I also describe how, without the resources to create a fully digital responsive environment, I planned to "Wizard of Oz" a responsive environment, controlling lights and sounds with WiFi and using a Scalar database to navigate the natoms, triggered by visitor choices and behaviours.

The bulk of the experiment was presenting the natoms to the public and recording the choices they made. To do this, I used Robin Laws's beat analysis (Laws, 2010) described in Chapter 3. I observe that it is not just the natoms that the visitors chose that make the story, but the transitions between the natoms. In an interactive story, the nature of transitions is complicated by fact that a transition to an individual natom will differ according to the natom that preceded

it. So I also complete a transition analysis of the same guided tours. The key observation is that an unfortunate transition can kill the narrative momentum of the story, and that too many transitions definitely do so. The visitor is not empowered as an author, and does not consider narrative flow when choosing what do next. I discuss how an algorithmic solution could mitigate the impact of poor transitions by limiting choices (as discussed in Chapter 3, this is a common strategy in game design). I also discover that the sonic and lighting natoms were not as effective (and thus affective) as I had hoped and consider the reasons why.

In Chapter 5 I analyse the results of my experiment and conclude that while I achieved personalisation, I did not achieve ambient interpretation or encourage numinous experiences at Chawton. I hypothesise that ambient interpretation might still be possible, although beyond the limits of the resources I had available.

To be properly numinous, there must be fundamental change to the meaning of storytelling in cultural heritage sites. If (and it's a big if) they want to engage the emotions of their audience in a truly effective way, cultural heritage needs to more fully embrace fiction. I use this word carefully, I am not simply talking about more theatrical storytelling of historical facts As we shall see, I am contemplating invented realities. Three factors may make them reluctant to address that change: heritage has authority, professionals have reputation and visitors don't seek doubt. If we are to rise to Staiff's challenge, his demand "for experiences where the power of the somatic, the emotional and serendipitous are acknowledged as possible ends in themselves; for co-authored experiences and meaning making" (Staiff, 2014) then we must let go of information, and interpret (or tell stories of) possibility.

Chapter 2: Emotive technology in heritage interpretation

2.1 An overview of the literature

Heritage studies is a comparatively young field, which has some emerging journals of its own but whose scholars also come from a wide range of other disciplines.[1] Much of the literature in heritage studies, especially in the field of interpretation, is of a practical, professional nature. The foundational text for that field is Freeman Tilden's *Interpreting Our Heritage* (Tilden, 1977), originally published in 1957. That work focussed on interpretation of predominantly natural heritage locations such as US National Parks (where Tilden was a ranger) but since then, most writing on the technology of interpretation has been about indoor spaces, and in particular museum galleries. Wherever the location, much has been written that builds upon the principles that Tilden defined, for example (Bucholtze, Lackey, Gross, & Zimmerman, 2015), (Ham, 2013), and (Lord & Lord, 2002)

However, not every modern writer worships at the altar of Tilden. For example, Russel Staiff (Staiff, 2014) argues against the professionalisation of the word interpretation. His key point is that everybody interprets everything, all the time. Using Michelangelo's David as an example, he argues that while the erotic and

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[1] The academic literature of heritage studies ranges across schools of psychology, management, humanities, and science. Academic journals with a reasonable amount of heritage interpretation content include: *Curator: The Museum Journal; Digital Applications in Archaeology and Cultural Heritage; International Journal of Heritage Studies; Journal of Cultural Heritage; Journal of Education in Museums; Journal of Heritage Tourism; Journal of Museum Education; Museum and Society; Museum International; Museum Management and Curatorship; Museum Practice; Museums and Social Issues*; and, *Visitor Studies*. But given the digital nature of my subject, there is also much to be learned in journals of computing and electronic engineering, for example: *Communications of the ACM*; *Computers in Entertainment*; *CyberPsychology & Behaviour*; *Games and Culture*; *User Modelling and User-Adapted Interaction*; and *Psychological Science in the Public Interest.*

comedic use in popular culture of the statue's penis or buttocks, displace the "authorized" narrative of David as the slayer of Goliath, sculpted by an artistic genius, "the two stories are not mutually exclusive for many viewers despite them being somewhat incompatible. […] Heritage interpretation cannot manage this level of complexity without radical editing of the content or unsatisfactory and ethically suspect reductionism." (Staiff, 2014, pp. 29-42)

Staiff also argues that Tilden's approach "maintains a hierarchical power relationship between the 'expert' and the non-expert, between those with 'the knowledge' and those 'without the knowledge.'" He does acknowledge that later in the book, Tilden (in his discussion of aesthetics and beauty) "opens up the possibility of (1) the power of feelings and the role of sensorial experience of heritage and (2) visitor empowerment and (3) interpretation as a social construction." But, Staiff claims, Tilden quickly closes that door because it "potentially unravels many of his principles of interpretation." Overall he considers Tilden's work dated, and so it is. Perhaps he is correct that it is past time to move beyond Tilden's principles. One radical approach is *Counter-Tourism* (Smith, 2012) a methodology for visiting cultural heritage, that wrests control of the experience from heritage professionals to put it the hands of the visitor. His view of 'interpretation' is "the professional term for those who dress up and perform 'historical persons'" (Smith, 2012, p. 85), which suggests a wilful ignorance of the sector. On the other hand his definition of tourists "pilgrims, up for transforming themselves" (Smith, 2012, p. 15) is to be applauded. It hints at a concept, numen, that I shall explore in more depth later in this chapter.

Another basic reference used by museum professionals is *The Manual of Museum Exhibitions* (Lord & Piacente, 2014), a compendium of practical advice and philosophical essays that sits on the shelves of many museum back-offices. First published in 2002, it proved popular enough for a re-written second edition in 2014. However, as we shall see, these and similar manuals play it safe, accepting precedents like Tilden at face value and falling back on experience of what works, without attempting to understand why it might work, or challenging cultural heritage to do better. The challenges have come from more academic writing on museums and heritage, for example, *The Educational Role of the Museum* (Hooper-Greenhill, 1999) from staff and alumni of Leicester University's Museum Studies department, and associated Research Centre for Museums and Galleries. Leicester's postgraduate courses in Museum Studies started over 50 years ago, and since then other courses in museum and heritage management have given voice to further writing. More recently, the opportunity to use the internet to sidestep traditional publishing houses has created an international audience for

well-regarded web-logs (blogs), some of which have spawned books such as Nina Simon's *The Participatory Museum* (Simon, 2010) which challenges the very role of cultural heritage. This project considers carefully the relationship of narrative to interpretation, a topic which has been explored by a number of authors.

2.2 The technology of the gallery

Most of the existing literature on storytelling in heritage is found in texts aimed at professional practice, but little of it engages directly with the idea of storytelling. Roger Miles, during his career in museums of Natural History wrote both practical advice and more academic contributions to the literature of interpretation. His 1988 essay *Organising the Intellectual Content* (Miles, 2012) was then some of the little advice available to museum and heritage designers about how to structure narrative at cultural heritage sites. His advice summarises the development of museum interpretation throughout the twentieth century:

> The point is that though learning does not necessarily involve a hierarchical sequence of events, understanding does. When the aim is to produce understanding, there are sequential constraints on the learning objectives and hence on the order in which concepts are presented in an exhibition. Some concepts can be taken for granted, sometimes either one of a pair may be presented before the other, but for many pairs of concepts it will be obvious that any understanding of one presupposes some grasp of the other. (Miles, 2012, p. 51)

Miles writes here from a science learning perspective, but of course. But as we shall discover in Chapter 3, the same principle applies in storytelling - what turns facts into narrative is the order in which they are told. That said, Miles is not particularly concerned about storytelling:

> The exhibition needs to be structured to facilitate learning, but the structure is not conceived as something to be imposed on the visitor. Its purpose is solely to unify the presentation of intellectual material and make it easier for the visitor to find their way around the exhibition, following their own inclinations, delving deeper here, skating over something there, going back to something already seen when they feel the need to. The depth of understanding that results from a visit is entirely the visitor's own affair, all the exhibition organisers can do is present the knowledge at what seems to be the appropriate level.

> What we are suggesting is treatment at not less than two, possibly three or even more levels of resolution, suitably identified for the visitor's benefit, the components being organised around a spine that corresponds to treatment at minimum resolution. The multi-level structure not only accommodates the wide range of the visitors' interests and attainments but also provides a way of handling the wealth of material available for inclusion in the exhibition. (Miles, 2012, p. 53)

If this seems old-fashioned, it is. Claisse et al. (2020) make the case that the "early museums were places where touching, holding and smelling were an integral part of the visit, a courtesy paid by the curator or the collection owner to their visitors or guests." This was the case until the middle of the nineteenth century, when museums took on a new role that serves a wider public and was often publicly funded too. This role had a focus on leaning. Public museum pioneer (Pitt Rivers, 1891) argued that "the great desideratum of our day is an educational museum, in which the visitors may instruct themselves." And indeed many museum and heritage professionals still see learning as a primary product, if not the core product, of the sector.

But that is not necessarily the reason why people visit in the twenty-first century. Falk (2016, p. 159) says that visitor's motives generally fall into one of five categories:

- Explorer – "The typical Explorer visitor perceives that learning is fun!"
- Facilitator – Facilitating parents and facilitating socialisers, both meeting the needs of others in their group. Not all those needs are learning related
- Experience seeker – motivated to visit primarily in order to "collect" an experience, "been there, done that," very often all they want to learn is which are the top three things to see in this place
- Professional/Hobbyist – a tiny proportion of visitors but often much more influential. Their learning needs are often not met by the interpretation but they are equipped with their own pre-reading etc.
- Recharger – not a large proportion of visitors to museums, but the proportion may be higher in places that combine museum elements with gardens and even countryside components, like many National Trust places.

The first four categories may come with some sort of learning as a motivator, even if the current style of museum didacticism does not quite meet every

group's needs. But the last group in particular might seek out museums as a respite from learning. Packer and Bond (2010, pp. 421-422) argue "Mental fatigue, caused by the stresses and strains of everyday life, is a common complaint in today's society, and the need to escape from the personal and interpersonal demands of life is one of the major reasons that people have for engaging in tourism and leisure experiences." They go on to explain that a lot of work around restorative environments is based on the work of Kaplan and his Attention Restoration Theory. Rechargers don't visit museum spaces to learn, which requires a sort of tiring "directed attention", but rather to be fascinated - to have their attention engaged involuntarily or effortlessly. Fascination allows your directed attention to be rested. In this respect Kaplan's fascination sound very similar to Csikszentmihalyi's concept of flow, which we will explore further in Chapter 3.

As well as fascination, Packer and Bond (2010, p. 422) describe three other components of restorative environments: being away (from routine); extent (the environment need to have enough content to keep you occupied a while) and compatibility (of interest – being bored is not fascinating). These things point to the infinite horizons of a walk in the countryside as being restorative (if the countryside is compatible with your interests) but their analysis of responses to museums, art museums, gardens and zoos, shows that the countryside is not the only place you can recharge.

Packer and Bond sought factors that make one museum a better restorative environment than another. They created a "satisfying experiences framework" which compared the restorative experience at a museum; an aquarium; a garden; and, an art gallery. They analysed each visit according to the variety of experiences:

> Object experiences, which focus on something outside the visitor, such as seeing rare, valuable, or beautiful objects; cognitive experiences, which focus on the interpretive or intellectual aspects of the experience, such as gaining information or understanding; introspective experiences, which focus on private feelings and experiences, such as imagining, reflecting, reminiscing, and connecting; and social experiences, which focus on interactions with friends, family, other visitors, or museum staff.
>
> **(Packer & Bond, 2010, p. 424)**

They measured these at four different sites in Australia: a museum; an aquarium; a garden; and an art gallery. Immediately they spotted that visitors to each find

different experiences the most satisfying. The object experience of the fish in the aquarium was by far the most satisfying experience in any place, the cognitive experience of the museum was the most satisfying part of that visit, which suggests that learning can be a part of non-learning motivations for visiting. The social experience most satisfying in the gardens and, although the art gallery was the most balanced between the four experiences, the social experience mattered to only 10.7% of visitors and the introspective experience mattered most to 29%.

It was also "found that local visitors placed more importance on social and introspective experiences, and tourists placed more importance on cognitive and object experiences." Tourists of course are Falk's experience seekers and "are more likely to be looking for a learning and discovery experience—they want to discover new things and often try to 'see as much as they can.' These experiences may be incompatible with a restorative experience." (Packer & Bond, 2010, p. 432)

The study concluded that natural environments, be they parks or gardens, were more restorative than those focused on cultural heritage sites like museums and galleries, but cultural heritage sites can also be restorative for frequent visitors (rather than first time visitors). Falk notes that Rechargers might well be more frequent visitors to the same museum, and this seems to back up that assertion. Importantly, for this thesis, authors also suggest that museums should "explore ways in which introspective experiences might be encouraged and supported" (Packer & Bond, 2010, p. 432). Can the power of story, as opposed to an emphasis on didactic interpretation make museums and cultural heritage sites better restorative places?

The Manual of Museum Exhibitions (2002) features chapters from practicing museum professionals, both working within institutions, and consultants contractors working for them. For example, Hugh AD Spencer runs Museum Planning Partners, and once worked at Lord Cultural Resources as their Principal in Charge of Exhibition Development. While he was there he wrote a chapter on Interpretive Planning for the first edition of the manual (Spencer, 2002).

Here Spencer describes the interpretive plan as "a component-by-component description of all exhibition and programme components in terms of:

- Thematic area
- Communication objectives and experience aims
- Exhibit media options
- Special requirements and opportunities"

He gives an example of a plan he developed with client S.Y. Yim, curator of the Hong Kong Heritage Museum for a gallery of artefacts associated with Cantonese Opera. The gallery is comprised of four components: Introduction and Entrance; Heritage and Study Precinct; Performance and Participation Precinct; and The Living Experience. The introductory component's objectives include:

- To make a powerful first impression of the cultural impact of Cantonese Opera, its creative diversity and its expressive character
- To transport visitors into the traditional setting for Cantonese Opera
- To communicate that the study of Cantonese Opera is a rich and informative means of studying change and continuity in Chinese cultures worldwide - with particular relevance to the Hong Kong region
- To communicate [how the gallery is organised]
- Two of the "media and means of expression" that he outlines are:
    - Fushan Theatre Lobby/gathering place - modelled after a traditional venue for Cantonese Opera in the region. The theatre theming for the ceiling, floors and walls will provide an environmental context for all exhibits within the hall.
    - The Great Mask - a large scale monochromatic face relief. Constantly changing images of faces in Cantonese Opera make-up (based on the characters made famous by important Cantonese artists) are continually projected onto the mask - illustrating the rage of design, expression and human character of this medium.

He also presents, as a case study, the Earth Galleries at the Natural History Museum, London. In particular he focuses on the impressive threshold created and opened in 1996, with the expressed intention of meeting the "need to place the new galleries on the London visitor map of 'must-see destinations' aspiring to the status of the blue whale of the Natural History Museum, or the mummies of the British Museum."

Spencer doesn't dwell much on how the story fits into the spaces, but he does offer an example schema. The important thing to note is that his thematic approach tends towards a non-linear model of interpretation, and that in turn relies on the introductory component of the exhibition to do most of the heavy emotive lifting, as the "wow" moments in his examples (The Journey Through the Centre of the Earth at the Natural History Museum, and The Great Mask in Hong Kong) illustrate.

Over time, we understand more about how visitors construct meaning in galleries. In a recently updated edition of the manual, Maria Piacente's chapter on Interpretive Planning (Piacente, 2014) very reasonably starts off with three essential questions: "What meanings do we wish to communicate? To whom do we intend to communicate these meanings? What are the most appropriate means of communicating these meanings?" Here, we see a change from the vocabulary of facts in Miles' work, and a behaviourist approach to learning in Spencer, to a more constructivist language that acknowledges plurality of meaning, and that visitors will come to the exhibit with their own understanding and perception.

Piacente says proper planning leads to exhibitions that are "Relevant, Meaningful and Relatable: because the majority of visitors are not artists, curators, historians, scientists or members of a special interest group, museum professionals need to find better ways to communicate complex and unfamiliar ideas." She also quotes Tilden "'Information, as such, is not interpretation. Interpretation is revelation based upon information'"

A good plan will also be visitor centred, and Piacente points out that "Visitors attend as individuals or in groups, as tourists, as part of a school visit, or as a family. Each grouping or type or visitor learns and behaves differently in a museum setting." There has been a lot of discussion about the validity of Learning Style models in recent years, most notably from Pashler, McDaniel, Rohrer, and Bjork (2008), but what is true is that museum visitors are in a very different learning mode to academics or school-children. Piacente returns to the subject of learning styles later in her chapter, discussing the "means of expression" a designer might use. This is a useful phrase for exhibition designers, because it doesn't just go straight to defining the medium - although of course each means of expression does steer one's thoughts to specific media. She lists four:

- Didactic means of expression include text panels, cases of artefacts and displays of works of art […]
- Hands-on/minds-on activities are often low-tech interactives that incorporate mechanical devices, comparative exhibits, feedback stations and open-ended questions […]
- Multimedia […] from videos to touch-screens and from augmented reality systems to simulators or even large-format theatres […]
- Immersive environments including walkthrough experiences and dioramas that may incorporate sound, video and hands on experiences. (Piacente, 2014)

However, although she starts from a more constructivist perspective, Piacente soon falls back on old ideas of organising information, even if she expands a little on Spencer's discussion of the thematic framework. Once again we read about the idea of a linear, or "sequential" structure, giving as examples a simple chronology, and spatial sequences - room to room, or traversing a country. She does also explore non-linear structures, which she says "accommodate more complex exhibitions that require the presentation of multiple voices and perspectives." She offers a number of examples of nonlinear structures:

- Focal specific structures establish one major topic or theme around which are clustered a number of subthemes that radiate from the core, much like the petals of a flower or the layers of an onion
- Parallel thematic structures establish a set of themes or subthemes that are used over and over again to explore many topics. Natural history exhibitions often employ this type of interpretation
- Independent structures are frameworks in which individual loosely related or unrelated topics are addressed within a single area or gallery. Such structures are sometimes employed by science centres (Piacente, 2014)

However, Piacente's discussion of learning styles leads in to a piece contributed by Christina Sjoberg (2014). I remain unconvinced by the many models of learning style, Pashler et al. (2008) make the compelling statement that "The contrast between the enormous popularity of the learning-styles approach and the lack of credible evidence for its utility is, in our opinion, striking and disturbing." I am no more persuaded by much of what Sjoberg says, but I cannot argue with one assertion: "Museum learning is: informal; voluntary; and, **affective**." [my emphasis] This last is important; Sjoberg argues that museum learning focuses "on our feelings, attitudes, beliefs and values" rather than being purely cognitive. But, even though Sjoberg speaks of "our feelings" there's no discussion of the relative merits the various narrative structures have in manipulating visitors' emotions.

2.3 A place for emotion?

Even when it does engage directly or implicitly with the role of narrative, the literature rarely discusses how the interpretive narratives may or may not engage visitors' feelings. Does emotion have any place in cultural heritage interpretation? Poole (2018) suggests "Affective interpretation that privileges emotion, personal response and feeling as essential components of heritage can be a source of conflict amongst audiences for whom dispassionate factual rigour is essential to

the understanding of history." On the other hand, the essay *Heritage that Hurts: Interpretation In A Post-Modern World* (Uzzell & Ballantyne, 1998) explores the concept of "hot interpretation" and offers an argument against the cool, dispassionate museum approach, especially when dealing with difficult, or controversial topics. They conclude:

> Emotions colour our memories and experiences and thus our selective attention to information. Our minds are not virgin territories and our past experiences and decisions influence our future actions. This applies to all areas of our lives whether it concerns career, marriage, consumerism or health. To deny the emotional side of our understanding and appreciation of the world and our relationships is to deny the very humanity that makes us part of the human race. This should also not be interpreted as if there are two types of thinking which exist independently of one another - cool and dispassionate and hot and emotional. Neither are we arguing that the latter has priority over the former. What is suggested, however, is that issues which involve personal values, beliefs, interests and memories will excite a degree of emotional arousal which needs to be recognised and addressed in interpretation." (Uzzell & Ballantyne, 1998)

They even invoke Tilden:

> Meanings and relationships necessarily have an emotional dimension yet these have often been excluded from interpretation. This may have something to do with the scientific and academic background to most interpretation, where emotion is seen as contrary to objectivity. Two of the six principles of interpretation put forward by Freeman Tilden over 40 years ago surely presumed an affective component. Tilden argued that "the chief aim of interpretation is not instruction but provocation". How better to provoke than through addressing the affective side of the visitor's personality? He also advocated that interpretation must "… address itself to the whole man rather than any phase". This must include people's feelings and emotions. (Uzzell & Ballantyne, 1998)

All this supports a thesis that cultural heritage should not shy away from emotive topics. A by-product of the argument is an implicit rejection of arguments like Poole's. Emotions are something that museums should factor into their interpretation.

The discussion of affect and emotion in heritage can also be found in more academic literature. Much of it explores motivations for visiting. For example,

anthropologists Cameron and Gatewood (1998) identify three broad types of motivation in the majority of visitors to historic sites: Pleasure; Learning; and, Personal Experience. The Pleasure motivations include: fun; relaxation; and "aesthetic" enjoyment. More interestingly, the Personal Experience group of motivators includes: nostalgia; authenticity; a feeling for the time; and, escape, go back in time. These last three form a subgroup, which Cameron and Gatewood call "numen". This intriguing term is further explored by Latham (2007) who says "Numinous experiences are seen as a deeply felt, connective encounter with any object - not just artistic works or beautiful things - and can happen anywhere and anytime, depending on the coming together of many things at one point in time". I experienced this, and realised it is a rare occurrence. In Crete last year, visiting the island with my family, we made excursions to two Minoan palaces. The first and most famous was Knossos, which was an enjoyable and educational trip. But the numinous experience occurred at the less complete remains – at Malia. I was following my wife and daughter as they took photographs, when I happened to look down at a threshold stone I was stepping on, when I realized that centuries, *millennia* ago, people had stepped on the very same stone. In that moment I was connected with those people, far more so than with the people I read about and imagined at Knossos. I wished I could bottle that feeling, but I could not even describe it. Arguably every act that we call "heritage interpretation" is an effort to create feelings like that.

But can we even measure it? Universities (for example, the University of Surrey (Treharne et al., 2013)) are exploring in particular how digital technologies might enhance the visitor experience and offer cultural heritage sites insight into visitor behaviours. Othman (2012) evaluating mobile experiences, created a Museum Experience Scale and a Church Experience Scale (one of the projects he was evaluating was a mobile guide for Churches). Of particular interest are the questions each scale used to measure what he termed "emotional connection":

- The exhibition enabled me to reminisce about my past
- My sense of being in the exhibition was stronger than my sense of being in the real world
- I was overwhelmed with the aesthetic/beauty aspect of the exhibits
- I wanted to own exhibits like those that I saw in the exhibition
- I felt connected with the exhibits
- I like text-based information as supporting material at museum exhibitions
- I felt spiritually involved with the church and its features
- I felt connected with the church and its features

- I felt emotionally involved with the church and its features
- I felt moved in the church
- The church had a spiritual atmosphere
- My sense of being in the church was stronger than my sense of being in the rest of the world (Othman, 2012)

Many of these statements speak to an emotional connection with the *genius loci* or “spirit of place”. Many people visit historic sites to be immersed in the place, and where the place no longer exists, there is continuing research into alternative methods of immersion. Archaeologists have long been using computer modelling to help visualise sites, "rebuilding" what might today be ruins, or virtually "restoring" buildings that have seen centuries of modification. The primary purpose of such models has been experimental, helping the researcher compare hypotheses. Of course once these models have been made, people want to share them, with each other and with the public. Pujol and Champion (2012) use the phrase Virtual Heritage, a term for which they take the definition from Stone and Ojika (Stone & Ojika, 2000): “…the use of computer-based interactive technologies to record, preserve, or recreate artefacts, sites and actors of historic, artistic, religious, or cultural significance and to deliver the results openly to a global audience in such a way as to provide formative educational experiences through electronic manipulations of time and space.” When it is done well, it’s done with the intention of transporting the audience to a particular place and time, and that's why Pujol and Champion talk about presence: “Since ‘virtual heritage’ is the name VR applications are given when used for the dissemination of cultural heritage, it logically follows that in VR applied to cultural heritage, a meaningful sense of presence is also the intended outcome.” (Pujol & Champion, 2012, p. 84)

However, Pujol and Champion warn that cultural heritage interpretation isn't just about how buildings look. They argue that to think of virtual heritage as simply the re-creation of buildings or other "tangible" artefacts in the digital domain is to ignore the importance of human interaction, ritual, communication, symbolism and representation and all the other intangibles that are part of culture. They go on to try and define "cultural presence," citing an earlier work by Champion (Champion, 2006) to suggest that "cultural presence corresponds to the feeling that people from a specific culture occupy or have occupied a virtual environment and transformed it into a culturally meaningful place." This is something I recognise from what the National Trust tries to do in the places it looks after. But, they say, such "environments represent a palimpsest in which past social

interactions are layered and carved into the fabric of the environment. Although visitors can see 'culture', they cannot participate in it, either due to a lack of culturally constrained creative understanding or because the originators have long since passed away."

They summarise their discussion of cultural presence with the following:

> So cultural presence in the cultural heritage field is not limited to the reconstruction of a place; ideally it would also encourage empathy, interaction and collaboration to enhance awareness and understanding of past or foreign cultures. So for cultural presence, 'presence' is the means and 'culture' is the goal. Unlike the test environments of typical presence research, virtual heritage projects should not aim at the fidelity of representation of the world in general, but towards a cultural context, containing not only objects and active agents but also the inter-relationship of their situated beliefs and values. Hence, presence becomes a 'being – not only physically but also socially, culturally – there and then.' (Pujol & Champion, 2012, p. 89)

This is a fine ambition, and it looks forward to virtual worlds that are explored not just through looking and discovery. Pujol and Champion make the case for historical games, wherein interacting with virtual residents of that world is not just something players do to achieve a goal, but a goal in itself. Success is measured by how well the player integrates into the virtual historical world, which implies that they must consider their own emotions, and how they (or their avatars) display them appropriately. Therefore "victory" in such a game would be as much an emotional experience as a procedural one.

But, digital heritage is not just about virtual worlds. Pine and Korn (2011) claim that digital technology offers so much more than Virtual (or even Augmented) Reality. We should, they argue, be thinking in terms of all the possible combinations of the variables of the Reality (Time, Space and Matter) and the equivalent variables of the digital Virtuality (for want of better words: no-time, no-space and no-matter). The diegesis of a computer game, or VR model, is a function of these three no-variables, as it is made of bits of computer code. But run that virtual world through a pair of VR goggles, or even a humble Tom-Tom navigator, and you suddenly have Augmented Reality (time and space, but no-matter). Conversely, use a wii-controller to manipulate a computer game and you find yourself in the realm of no-time and no-space, but with matter - what Pine and Korn call Augmented Virtuality.

Superimpose a different time (or no-time) on space and matter, and you have what they call warped reality:

> Such reality-based time travel happens whenever experiences simulate another time... such as Renaissance Fairs and living history museums (Plimouth Plantation, Colonial Williamsburg, and the like) or transport us ... even into the future (albeit a fictional future) such as at, yes, Star Trek conventions. (Pine & Korn, 2011, p. 21)

In these warped realities, a cultural heritage audience is able "*to participate in the construction*" of "*realities that capture objects and processes of scientific, social or spiritual value* [and presents them] *as accurately, authentically, and engagingly as possible*." Places like Plimouth Plantation share their work in "*a sensitive, safe and durable manner to as wide and long-term an audience as possible, to provide an effective and inspirational learning environment that best communicates the intended pedagogical aims*." These italicised quotes are not from Pine and Korn, but rather from the paper (Pujol & Champion, 2012, p. 86) I mentioned earlier, on Virtual Heritage projects. And yet Plimouth Plantation and its like are currently entirely analogue creations, that no-one would consider applying the word "virtual" to. I think, and Pine and Korn imply, that digital technology has the potential to greatly enhance warped reality experiences, without making them virtual. I'd also argue that cultural "presence" occurs in these warped reality spaces, so the word need not only apply to virtual worlds.

Drawing on ideas of cultural presence, Joao and Maria Neto, part of a team working to interpret Monserrate Palace in Sintra, Portugal, experimented with what they called Embodied Conversational Agents (Neto & Neto, 2012). These are virtual historical characters, "equipped with the complete vital informational [sic] of a heritage site." The idea was that the virtual character would capture the visitor's interest with a non-interactive animated opening scene, in the manner of a cut-scene on a video game, but then would open up a real time conversation that would immerse the visitor with realistic "face movements, full-body animations and complex human emotions." The conversation would be more sophisticated than a simple question and answer system, by being "context aware," breaking up the knowledge base into modules, to make interactive responses more possible.

2.4 Building a model of affect and affordances

Affect is not an easy thing to think about, it seems. Or should I say, the cultural heritage sector finds it difficult, perhaps taking a conservationist's approach, that if you don't fully understand a thing it is best to leave it untouched. Games creators seem to blunder in, waving affordances about like they are going out of fashion. As we will see the games approach is not academically rigorous, but it seems to work for many games. Perhaps it offers at least a starting place for cultural heritage.

The heritage sector can sometimes seem vague on the affect(s) they want to trigger in their audience. "Fun", "Feelings", "Empathy" and "Attitude" are mentioned in Arts Council England's Generic Learning Outcomes (MLA, 2008), but with nothing more specific than that. Nostalgia seems to be a big motivation for places like the Museum of Brands, but is that all. It seems literature on heritage sector is uncertain what we mean by emotions. Take for example (Palau-Saumell, Forgas-Coll, & Sánchez-García, 2016) which measures emotions as a value for money proposition, and draws their catalogue of emotions from a paper about customer quality evaluations and loyalty. Even *Emotive*, the recent EU-funded Heritage Interpretation project, shies away from defining or codifying the emotional effect of heritage stories: "As devices recording physiometric measurements become more affordable, widespread, and less invasive, there is increasing potential in using physiometric measurements in **future** museum research" (Economou, Young, & Sosnowska, 2018) [My emphasis]. Of course that is partly because our knowledge of affect is complex and frankly hard to measure.

So maybe the first thing that cultural heritage may learn from games is the language of affect and affordances that gamer designers use. Such a model is not, as we shall see, based in robust science, but it does offer a shared language that I can use to compare what goes on in cultural heritage sites with regards to engaging people's emotions, and what has been the thinking among game designers.

"What are Emotions?" is a question asked by William Reddy in his book *The Navigation of Feeling: A Framework for the History of History of Emotions*. (Reddy) The first part of that book looks at the answers, from the field of Cognitive Psychology in the first chapter, and Anthropology in the second. He points out early, however that "Western specialists who study emotion cannot even agree on what the term emotion means. Reddy blurs the two at the start,

pointing out that attempts to codify emotions by the few facial expressions did encourage a lot of study looking at biological indicators of emotion, such as heart rates, hormone levels, skin conductivity etc. Reddy also states two "nagging problems:

> (1) What happened to emotions when arousals subsided and the face returned to normal?
>
> (2) How were emotions such as love, shame or nostalgia to be fitted into the scheme, when they had no obvious single facial expressions to go with them? (Reddy, p. 12)

Not only that, he argues that "twenty years of work by many researchers" has shown only that "In the absence of forced choice and pre-test training, agreement on other than happy faces was weak. If photographs of spontaneous facial expressions were used (i.e., naturally occurring ones, rather than the carefully posed ones of the initial tests), agreement sagged further."

He also highlights the problematic relationship between emotion and cognition:

> If a sudden sense of fear redirects attention to a dark corner of the room, why not conclude that this sense of fear is the cognition of the potential danger of that corner? No experimental or test procedure has been offered so far that would allow one to rule out this possibility; it is resisted solely on the grounds that it counters the common sense belief that emotion is something separate from thought, something opposed to 'reason.' (Reddy, pp. 14-15)

That "reason" he argues is questioned more and more. Try as they might, philosophers and researchers are finding it harder, not easier, to distinguish between "what counts as voluntary or controlled, and what counts as involuntary or automatic" (Reddy, p. 15) This is not helped by subjects' mis-attribution of arousal.

Reddy also explores the difficulties measuring emotion. Most psychologists use valence, a measure of how pleasant or unpleasant an emotion is, and intensity, a scale of how difficult it is to override the emotion. Of course its not so black and white: fear is an "unpleasant" emotion, and yet horror movie audiences, theme park riders and computer gamers actively seek it out. Similarly Reddy argues that an emotion's intensity may be altered by the triggering event's relevance to a person's goals - here he uses health anxiety as an example:

> we generally pursue health for its own sake; but it is obvious that health is a means or condition for the pursuit of many, many other goals. As a result, pursuit of health as a means, and pursuit of health as an end in its own right, are likely to be indistinguishable (both to observers and to the person involved). Likewise, loss of health is widely regarded with fear or anxiety. Such fear or anxiety is a “badge” of the deep goal relevance of health. (Reddy, p. 24)

When he goes on to explore mental control, I fear he strays more into the study of cognition than emotion, but he is striving to support an argument that "emotions can be regarded as overlearned cognitive habits." Neuroscientists Panksepp and Biven (2012) take an alternative view. Their thesis is that while there are indeed many socially constructed, learned emotions, there remain a number of instinctive emotions (quite apart from sensory feelings like hunger, thirst etc) that all mammals share. Naming them is of course as Reddy points out a social and political minefield, but Panksepp and Biven label the seven core emotions that they have identified: SEEKING; RAGE; FEAR; LUST; CARE; PANIC/GRIEF; and PLAY. It’s interesting to note that play is here identified as an emotion, not just a behavior. Is it the play affect that drives horror and roller-coaster fans to seek out unpleasant fear?

What evolutionary benefit does a play emotion give us, and other mammals? Panksepp and Biven suggest that a play emotion has not been deselected by evolution because it helps mammals:

> learn nonsocial physical skills like hunting, foraging and so on. It is also surely important for acquiring many social capacities, especially nascent aggressive, courting, sexual and in some species competitive and perhaps even parenting skills. It may be an essential force for the construction of the many higher functions of our social brains. Playful activities may help young animals learn to identify individuals with whom they can develop cooperative relationships and know who to avoid [...] In short, the brain's PLAY networks may help stitch individuals into the stratified social fabric that will be the staging ground for their lives. (Panksepp & Biven, 2012, p. 354)

This may be the sort of assertion that Reddy is so sceptical about, but I'm not seeking to argue the point - for my study, whether emotions exist beyond cognition, or are tightly intertwined with cognitive thought is hardly relevant. I am building a model of how game designers are thinking about emotion, not arguing

whether they are right or not. I will start to build that model around Panksepp and Biven's seven core emotions (given their thesis that all mammals, at least, have the capacity for play), plus a broad social emotions category and another for what they call sensory feedback, such as hunger:

Figure 2 A representation of the emotions described by Panksepp and Bevan

Moving now on from neuroscience to anthropological models, which have been influential in writing on games and emotion such as Nicole Lazzarro (2009), a researcher for a number of big budget game producers, who we shall return to later in this chapter. She draws a great deal upon the work of largely discredited anthropologist Paul Ekman. Reddy wastes little time on him but begins his examination of an anthropological approach by outlining the identity crisis of the discipline itself, especially in the area of the "production of knowledge" (Reddy, p. 34). He mentions the psychocultural model of emotions, an approach, as with cognitive psychology, that is built on the idea that there is "a broad commonality in human emotions" (Reddy, p. 49). He tackles the constructionist approach first, with the work of Michelle Z Rosaldo. Her study of the Ilongot people of a mountainous region of the Philippines led her to conclude that emotion was, at least in part, a product of language. However a roughly contemporaneous study in Tahiti by Robert Levy concluded that people suffered the symptoms of grief even if they didn't have a word for it.

However, Reddy also relates a constructionist argument that is also a more cutting critique of the psychological view of emotions, from Catherine Lutz.

> In Lutz's view, the notion that emotions are biologically based is not simply erroneous, it is part of a larger, insidious, gender-biased Western view of the self that privileges alleged male rationality over the supposedly natural emotionalism of women. Expert and lay assumptions coincided, Lutz charged, in regarding emotions as internal, involuntary, irrational, potentially dangerous or sublime, and female. Men were rational and therefore better suited to action in the public sphere. Ethnographic research showed, however, that emotions were a product of social interactions and showed, as well, that outside the West, emotions were generally not distinguished from thinking in the peculiarly sharp way Westerners distinguished them, and were generally regarded as an outcome of social interaction, rather than as rising up, ineffably, from within. (Reddy, pp. 39-41)

This argument requires a change in philosophy. If knowledge is constructed by culture, it hard to criticize constructed knowledge, be that headhunting in the Philippines, or Western cognitive science. According to Reddy, Lutz's approach was less about culture and more about discourse as defined by Foucault. But that is an argument well beyond the scope of my work.

Reddy gives some attention to other anthropological models too, but not much. What clearly interests him about those he mentions, are steers towards a concept of emotion as performance. Indeed his long conclusion to the chapter, which starts out as an attempt to reconcile cognitive psychology and anthropology, is mostly about control of emotion through performance - oversimplified as putting on a happy face.

Can it be argued that gamers "perform" emotion? Certainly it seems that the emotions Lazzarro (2009) writes about, such as fiero (triumph over adversity), may have common culturally learned performative signifiers for example, the fist-pump. Working for commercial clients, Lazzarro started using Ekmann's methodology to map gamers' emotions but soon realised its limitations, and expanded the team's observational techniques to include "changes in the body as well as the face, and sounds (such as laughter)". The final list of emotions they were confident in identifying during play included those that Ekman used, but also a number of other emotions like naches (pride in another's achievements), and as previously mentioned, fiero. These two, along with schadenfreude and embarrassment, add handy descriptors to the social emotions that Panksepp and Biven lump together and ignore in their study. Similarly, disgust puts a name to one of the sensory affects they identified. I've also added her wonder to that

sensory category. Some of that list, such as fear, are already represented by the core mammalian affects in my nascent model. Others, including amusement, curiosity, and anger/frustration, add nuance to some of Panksepp and Biven's descriptors, so I've included them in Figure 3 below. All these emotions, she says, can frequently be recorded and recognised when watching players of video games.

Figure 3 Adding the emotions identified by Lazzarro to those described by Panksepp and Bevan

Now we have a model of the core emotions, as described by Pankspepp and Bevin, overlaid with emotions attributed to gamers in the work of Lazzarro. To that I have below added a third layer. They are affective triggers or affordancies, drawn from Lazzarro's work and game designer Tynan Sylvester's recommendations for game mechanics (Sylvester, 2013a). Hamari, Koivisto, and Sarsa (2014) also offer motivation mechanics from their study of gamification.

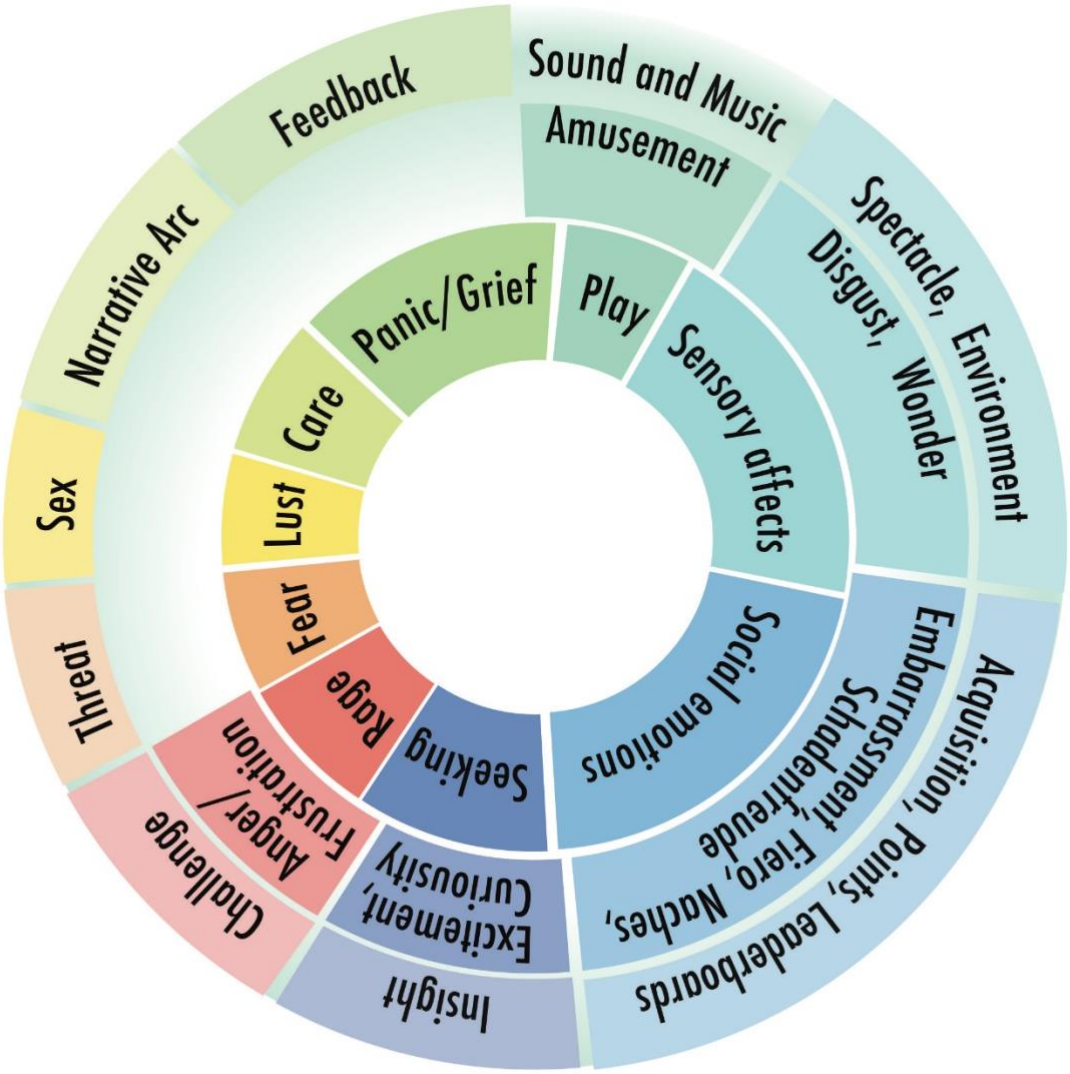


Figure 4 Ludic triggers and motivations

Given that each is a conflation of descriptions from these three sources, they deserve some further explanation. To demonstrate that this may be a model with which to review affective heritage interpretation, I will show that many of these triggers or affordancies have analogues in cultural heritage sites. We will see that real cultural heritage can do some of this just as well, or better than games. But there are some areas - personalisation, narrative and music – where there may be something that cultural heritage professionals can learn from game designers.

2.4.1 Environment and spectacle

Many visitors to cultural heritage sites are impressed by the view. It might indeed be argued that the many sites have been preserved, are regarded as heritage, only because they are beautiful (Uzzell & Ballantyne, 1998). Often, while playing

Red Dead Redemption, I'd pause. I wouldn't "pause" the game, or freeze it while I made a cup of tea, but I'd slow the protagonist's horse to a stop, and just admire the sunset. As the capability of computers and games consoles to display graphics improves, more and more resources are poured into creating photorealistic virtual environments. Sometimes they do this so well, that players choose to spend time just being in the landscape:

> This is why, between missions, I'll take him wandering throughout the landscape, lost in his own solitude, a chance to blend in amongst the townsfolk, to drink in the saloons, to play Poker and Liar's Dice, to search for treasure. This is why he'll ride into the wilderness at sunset, look up to see the stars, and just live the life. (Rissen, 2013)

In one game, set in the tunnels of a post-apocalyptic Moscow underground, Sylvester describes how play moved to the ruined, frozen, surface and the powerful effect it had on him as a player: "Though most would call Metro 2033 a shooter or RPG, I wouldn't, because I don't think it's about shooting or roleplaying. I think it's about discovering how a place like that makes you feel."

Whether or not the gamers Lazzarro studied felt they had been transported to the virtual world, she did see evidence of Wonder in their expressions, often from beautifully rendered or animated environmental effects. Sylvester separates out the beauty of "a sunset over the ocean" from the spectacle of "a slow-motion dive to dodge an incoming rocket."

Emotion through wonder and spectacle is something that cultural heritage organisations recognise. The full corporate name of the National Trust is, for example, "National Trust for Places of Historic Interest or Natural Beauty." Respondents to surveys at the Trust's most beautiful places, like Ightham Mote, for example, do report a higher emotional impact than elsewhere. Good museums know how to manipulate spectacle, by creating "wow" moments, often at the threshold of galleries. These can involve impressive exhibits, multimedia shows, interpretive set design techniques, or even the design of the spaces itself, such as the Great Court at the British Museum.

In games, while there is an enduring fashion for games that retain the "eight bit aesthetic" (Stuart, 2012) the general trend of graphic development has been towards cinematic realism and "presence" (Pinchbeck, 2009; Pinchbeck & Stevens, 2005; Riva, Waterworth, & Murray, 2014). I discussed presence in cultural heritage terms, and in particular Pujol and Champion's exploration of the

emotional impact of cultural presence in the previous section (2.3). But is worth mentioning here one of their observations.

> The conventional notion of presence as the sensation of 'being there' is a highly simplified way of expressing an internal perception of the environment and of ourselves in relation to it. A more comprehensive explanation would be that the sense of presence results from the interaction of various factors. These factors depend both on the system (immersivity, visual accuracy, real-time physical and social interactivity, invisibility of devices, consistency of the content) and on the participant (perception, attention, empathy, engagement, meaningfulness or relevance of the content, control, suspension of disbelief).
>
> **(Pujol & Champion, 2012, p. 87)**

It's interesting that they don't mention sound, but I am sure the omission is unintentional – it would not be conducive to presence if all that activity happened in an eerie silence. But the virtual worlds that these games create are not simply beautiful, they are immersive, creating environments which themselves tell stories. The way the long grass sways as your avatar walks through it, the shadow of a bird that you notice a moment before you sight the bird itself, the changing weather, all add to your immersion in the diegesis. The architectural details, textures and ephemera of your surroundings all have the power to inform the story.

Figure 5 Plimouth Plantation – a living history museum in Plymouth, Massachusetts, where first person costumed interpreters involve the visitors in the recreation of early colonial life

Wikimedia Commons / CC-BY-SA-3.0 / GFDL

Museums and archaeological sites often build reconstructed environments to encourage visitors' sense of presence among the exhibits and many historic sites are presented in such a way as to suggest the visitor has walked in on a room only recently vacated by the building's historic inhabitants. Perhaps those that manage presence most successfully are the living history museums such as Plimoth Plantation.

2.4.2 Acquisition, points and leader boards

Common sources of social emotions in games include acquisition, points systems and leader boards. Players collect virtual items in game, score points for collecting them (and shooting aliens) and get to claim the highest scores on a leader board that, back in the days when most games were made for arcades, would be displayed in the machine's resting state, between demonstrations of gameplay. At the crudest level, they are sharable social evidence of success, skill or commitment. Their affective and motivational power comes from sharing, but acquisition also has an impact on the individual. As Sylvester acknowledges, gambling games are all about acquisition, and computer games often simulate

the acquisition of wealth (or simply points). Of course gambling works in two ways, and the bitter emotions of loss shouldn't be disregarded.

Cultural Heritage sites tend to relegate acquisition to children's trails, many of which are "I spy" checklists, sometimes rewarded with a sticker to wear. The National Trust's *50 things to do before you are 11 ¾* campaign encourages families to acquire fifty life experiences (like making a mud-slide or flying a kite). Adult visitors are occasionally also offered "acquisitional" advice, such as "Five objects you must see."

The National Museums of Scotland have experimented with introducing a time-based, ludic element to the adult cultural heritage experience with *Capture the Museum* (Templeton, 2013). Visitors coming to the museum's programme of late-openings appeared to enjoy the game, but time limits and territory capture may not be compatible with the every-day visitor's wants and needs.

2.4.3 Insight

Many games designers try to include moments of discovery and insight in their games. Learning rewards and encourages curiosity and seeking. Not just any old learning though, "If a lesson is obvious," says Sylvester (Sylvester, 2013a, p. 21) "there's not much buzz in finally getting it because it was always fairly clear." Instead, he advocates a moment of insight, where everything that has come before "clicks into place and reveals the shape of the whole."

While museums and cultural heritage sites confidently have learning at the core of their mission, moments of "insight" as Sylvester described them, are less easy to discern. In Chapter 3, we will discuss a model of interpretative organisations espoused by Judy Rand (1993) which is common to many interpretive plans. It's a sensible model, and one you can see in exhibition galleries right around the world, most obviously those that begin with an introductory video to put everything else in context. But it front-loads the moment of revelation, and therefore does not give the visitor the moment of insight that Sylvester describes.

But sometimes museums do manage to pull off a moment of insight. The *Life and Death in Pompeii and Herculaneum* exhibition at The British Museum started with a context setting introductory video of course, and the famous plaster cast of the void left by a dog. There were no other casts though, just the objects, domestic, and commercial, mundane and beautiful, that were uncovered by the archaeologists. Until the final exhibit, almost a postscript, caught in the corner of the visitors' eye, which consisted of more plaster casts, human this time, voids of

two adults and two children seeking comfort. A stark reminder that the reason we have discovered so much about the Roman way of life was a terrible, intimate, catastrophe. A moment of *insight*, that enabled visitors to link the domestic life they had discovered earlier with real people, a family like any other, at a moment of cataclysm.

2.4.4 Challenge

Challenge is the emotional trigger that we most readily associate with video games, testing the player's dexterity and pattern learning before rewarding them not just with a sense of accomplishment, but progression within the game. Sylvester argues that it is not as essential to games as it might appear, and cites *Dear Esther* as a game that can "create powerful emotions without players struggling." However, Lazzarro says that the opportunity for challenge and subsequent mastery can be an important motivation for some, if not all gamers. She quotes the anonymous wife of one “hardcore” gamer “I always know how my husband feels about a game. If he screams ‘I hate it! I hate it! I hate it!’ then I know two things. A) He’s going to finish it. B) He’s going to buy version two. If he doesn’t say these things he will put it down after a couple of hours.” (Lazzarro, 2009).

People generally use museums and heritage sites as social spaces, to spend quality time with friends and family, not expecting to be challenged by most cultural institutions (though there are many notable exceptions – see below). That said, in the more immersive sites, like Plimoth Plantation or the outdoor section of the Zuiderzeemuseum, part of the enjoyment is navigating the sometimes archaic language and social mores of the costumed interpreters.

There is emotional challenge in cultural heritage. It is what Uzzell and Balantyine (1998) call “hot interpretation”, but it is not normally in the form of mechanics to obstruct the visitor’s journey. Instead, many sites want to offer visitors a good time, and may soften the blow of their challenging stories by building them into temporary programming - only experienced at particular times of day or days of the year. One stark exception is Berlin’s Holocaust Memorial or *Denkmal für die Ermordeten Juden Europas* (Memorial to the Murdered Jews of Europe), which does not back down from challenging its visitors.

2.4.5 Threat

Sylvester conflates revulsion (disgust) and fear, but here I'm using Threat as an affordance of the core Fear affect. Some things (Sylvester cites spiders and snakes) scare enough people (whether instinctively or through cultural learning) that they are often used in games to provoke fear. Of course the fear response of a gamer sitting in an armchair in front of a monitor is going to be different from the fear of the same person lost in a dark forest, but some games work hard to create a close approximation. Sometimes it's what you can't see that scares you, and so game designers have learned to use cinematic effects such as jump-cuts and music to increase tension and invoke a fear response.

Only a few cultural heritage sites offer the sort of threatening thrills that excite visitors to places like the London Dungeon franchise.

2.4.6 Sex

Sylvester (2013a) describes how "a game can show some bare skin, a pretty face, an alluring expression and people will notice […] Since these signals are so effective and easy to use, game designers, advertisers and filmmakers alike have ruthlessly abused them." But it's a difficult thing to get right in video games, and he argues that for broadly targeted games, its best avoided. "Let's be honest, sex in games is rarely super sexy sex" say the video game journalists Nielsen and Gray (2016); they continue "… the key to effective video game sex: good writing, good characters."

There is a lot of sex in cultural heritage: there is quite a lot in almost every art gallery. There were erotic items and wall paintings in the *Life and Death in Pompeii and Herculaneum* exhibition (2.3.3 above). There are museums that specialize in sex, and there have been exhibitions about sex, or with sections dedicated to the sexual aspect of the subject. Some are even designed to be titillating. I would argue that is dealt with in a somewhat less puerile manner in Cultural Heritage than in games, but perhaps the target market of the games is a different community of interest. Note as well that visiting a cultural heritage site is normally a very public activity.

2.4.7 Feedback

Feedback is offered to gamers through what happens on screen, haptic engines in controllers, and by sounds and music. In games the absence of feedback is a trigger for panic/grief which, as Panksepp and Bevin explain, has a lot to do with

isolation in mammals. When your character stops responding to your controls, is when a player feels a fleeting moment of grief.

In museums there can be surprisingly little feedback. Yes, there are interactive displays of the sort that science centres are keen on, but in collections heavy on historic environments such things are rarer. Where feedback happens it is often via guides, docents and or costumed interpreters. The best experiences of these are where the docent does not stick rigidly to a script, but can respond to the visitors' questions and, though observation of non-verbal cues, even respond to the visitors' perceived but unspoken interests. But human resources are expensive and can interact with only a minority of visitors.

Can digital technology enable sites to be more responsive to their visitors, without falling back on the relatively expensive resource of human feedback? Mark Eyles's work on ambient games (M. Eyles, 2012; M. Eyles & Pinchbeck, 2011) is an interesting development, as is the recent popularity (Dousos, 2017), of locatative gaming, empowered by the rise of mobile technology, and in particular smartphones. Eyles's starting point for his own research was Brian Eno's *Ambient 1: Music for Airports*. Eno, he said, described Ambient music using four features:

- Engagement - ambient music should be both ignorable, in the background, and interesting in the foreground
- Affect - ambient music should create a mood in the listener, which in turn should affect the way they perceive the space they are in
- Persistence - ambient music shouldn't require being listened to as a whole piece
- Context - ambient music should have a particular relationship to the location its played in

Eyles and collaborators (M. Eyles & Eglin, 2009; M. Eyles & Pinchbeck, 2011) describe how they tried applying these four qualities to two experimental games: *Ambient Quest* (in two versions) and *Ambient Quest: Pirate Moods*. In the first, players wear a pedometer, and the steps they accumulate going about their business in the real world gives them power to move a character in a simple computer-generated world. The second gives players an RFID Pirate Card, which accumulates pirate resources (Rum, Canvas, etc) while the players look at an exhibition. Players can choose to ignore the game and focus on the exhibition, or play the game more actively, by choosing to stay close to the panels that give them the resources they need most.

Could cultural heritage sites feed back upon the movements of visitors in a similar way to these experimental games?

2.4.8 Music and sound

> “And music is wonderfully subtle - even more than most emotional triggers. Nobody ever gives it the credit it deserves because nobody consciously pays attention to it during play. But even though the conscious mind is oblivious, the unconscious is still processing the music into a continuous flow of feeling. You can tell because music is easily separable from the rest of the experience. Listen to a game soundtrack by itself, and you'll feel much of what you felt during play. Play the game in silence, and you'll be surprised at how hollow it feels.” (Sylvester, 2013a).

Gorbman (1987) agrees that an audience can sometimes be oblivious to how music is affecting them; indeed her primer on narrative film music, is called *Unheard Melodies*. The role of music in games and new media also requires a little further exploration. Cohen (1998) begins from the notion that "music activates independent brain functions which are separable from verbal and visual domains," and goes on to define eight functions that music has in new media:

1. Masking - Just as music was played in the first cinemas, partly to mask the sound of the projector, so music in new media can be used to mask "distractions produced by the multimedia machinery (hum of disk drive, fan, motor etc) or sounds made by people, as multimedia often occurs in social or public environments." Lower tones mask higher ones, and listeners filter out incoherent sounds in preference for coherent (musical) sounds. Of course the downside is that music can mask speech too when speech is part of the intended presentation.
2. Provision of continuity - "Music is sound organised in time, and this organisation helps to connect disparate events in other domains. Thus a break in the music can signal a change in the narrative [for example the songs in *Red Dead Redemption*] or, conversely, continuous music signals the continuation of the current theme."
3. Direction of attention - Cohen has obviously done some experimental research on this function; broadly speaking, patterns in the music can correlate to patterns in the visuals, directing the attention of the user.
4. Mood induction - Cohen is careful to make a distinction between this and the next function, which is:

5. Communication of meaning - Cohen says "It is important to distinguish between mood induction and communication of meaning by music. Mood induction changes how one is feeling, while communication of meaning simply conveys information." Yet, when she discusses communication of meaning, she uses examples of "emotional meaning: "sadness is conveyed by slow pace, falling contour, low pitch and the minor mode." I take from this that her distinction is between music that makes the user sad, and music that tells the user "this is a sad event" without changing the user's mood.
6. A cue for memory - Music can trigger a user's memories from a past event that's totally unrelated to the new media presentation, if they've coincidentally heard the particular piece before, but the effect is more controllable with music especially written for the presentation. Gorbman also talks about themes, and what Wagner called “motifs of reminisence.” The musical term for this (from opera, arguably the first multimedia presentations) is leitmotif. The power of the music to invoke memories or "prepare the mind for a type of cognitive activity" is well recognized in advertising and sonic brands such as those created for Intel and Nokia.
7. Arousal and focal attention - "it is a simple fact that when there is music, more of the brain is active" Cohen says (without reference). She goes on to argue that with more of the brain active, the user is more able to filter out the peripheries of the apparatus running a new media presentation, and concentrate on the diegesis of the presentation, what Pinchbeck calls presence. On the other hand, she admits that some think that excess stimulation pulls focus away from central vision and towards the periphery.
8. Aesthetics - Here we come to what my colleagues report is the biggest issue with using music in interpretation. Cohen says "music is an art form and its presence enhances every situation in much the same way that a beautiful environment enhances the experience of activities within it." But she admits that aesthetics is subjective, and "music that is not appealing can disturb the user." Not only that, but some individuals may find all background music difficult to cope with.

Gorbman’s (1987) treatise on film music is also relevant to games: for example, in the distinction between diegetic music which is being played within the game world (for example a pianist might be playing in the saloon as your character walks in), and nondiegetic music (where as she says “an orchestra plays as

cowboys chase indians upon the desert") and metadiegetic music (where we hear a character "remember" a bit of music).

Collins (2008) begins by suggesting the subtle difference between the terms "interactive," "adaptive" and "dynamic". In her useful set of distinctions "interactive" sounds or music are those that respond to a particular action from the player, and each time the player repeats the action the sound is exactly the same. She argues that "adaptive" sounds and music are those that respond, not to the actions of the player, but rather to changes occurring in the game (or the game's world) itself. So "an example is Super Mario Brothers, where the music plays at a steady tempo until the time begins to run out, at which point the tempo doubles." (Collins, 2008, p. 2) She goes on to describe "dynamic" audio as being interactive and/or adaptive.

She also explores the various uses for sound and music in games. Her list is very similar to Cohen's. She quotes Cohen in relation to masking real-world environmental distractions, and in the distinction between the mood-inducing and communicative uses of music. She points out however, that the non-linear nature of game sound means that its more difficult to predict the emotional effects of music (and other sounds). In film, she states, it is possible for sounds to have unintended emotional consequences - a director wanting to inform the audience that there is a dog nearby will tell the sound designer to include a dog barking out of shot, but the audience will bring their own additional meaning to that sound, based on their previous experiences (which she calls supplementary connotation). But in games, she argues, where sounds are triggered and combined in relatively unpredictable sequences by player actions, even more additional meanings are possible.

She also discusses how music can be used to direct the players attention, or to help the player "to identify their whereabouts, in a narrative and in the game" (Collins, 2008, p. 8) She points out how "a crucial semiotic role of sound in games is the preparatory functions that it serves, for instance to alert the player to an upcoming event." (Collins, 2008, p. 8)

Sometimes, as Collins remarks, games are created that put musical choice directly into the players' hands. The *Grand Theft Auto* series gives the player a choice of in-car radio stations to listen too, so that their particular tastes are better catered for. Although they weren't around at the time of Collin's writing, many iOS and other mobile games have a feature by which the player can turn off game music and even other game sound effects if they so choose, to listen to

their own library of music, stored on the device. She even cites the game *Vib Ribbon*, or the Sony Playstation, which allows the player to load their own music from CDs, and the music then changes the gameplay according the structure of the music the player has loaded.

Collins also discusses the challenges that composers face when writing for games. For a start, Collins points out that "in many games it is unlikely that the player will hear the entire song, but instead may hear the first opening segment repeatedly, particularly as they try to learn a new level." (Collins, 2008, p. 10) She also comments that many games designers are learning to include what one composer calls a "bored now switch." After a number of repeats of the same loop of music, the sound fades to silence, which both informs the player that they should have completed this section by now, and stops them getting annoyed and frustrated by the repetition.

The other main problem is that of transition between different loops (or cues, as she calls them). "Early games tended towards direct splicing and abrupt cutting between cues, though this can feel very jarring for the player." (Collins, 2008, p. 4) Even cross-fading two tracks can feel abrupt if it has to be done quickly enough to keep up with game play. Composers have started to write "hundreds of cue fragments for a game, to reduce transition time and to enhance flexibility in their music." (Collins, 2008, p. 5)

Before we move on, note how, in the visual representation of this model of ludic triggers and motivations (Figure 4) affordancies are placed in boxes radiating away from the core, social or sensory affects that they are most likely to trigger. However I've already mentioned how some affordancies might contribute to the triggering of other affects: revulsion might help trigger fear for example. Sound and music can be used to trigger, or contribute to triggering, all the affects. Imagine the soundtrack to Jaws or Psycho, and contrast that to the music of Love Story for example. Music is playful, yes, so I've placed the label there, but its influence is more diffuse, and I've represented it in the diagram with a fuzzy halo around all the affects, to indicate how it can trigger our emotions without us even knowing.

2.4.9 Narrative Arc

This is what film can do so well, engaging the audience's empathy with one or more characters, as they face internal conflicts, grow and change. Games have tended to use "cut scenes" to mimic cinematic story arcs, but as graphic

technology has improved, more and more of the narrative arc can get worked into the game play. Without this arc, the players avatar is someone that things happen to, and the player simply reacts. The narrative arc transforms the avatar (and by extension the player) into the protagonist, with a cast of supporting characters and reasons for conflict, making decisions that could change their life – even if, in the game, the decisions are limited. Change is often at the core of such arcs, the avatar you play grows and changes as the story develops. Change is a common factor for a lot of the affordances described above, and indeed, Sylvester declares that "the bedrock principle behind all emotional triggers is change". A good game should enable a player to experience all those narrative changes, but not in the linear, fixed way that a film presents them. A games player wants to make the story their own, to feel they are at the centre of the story and in control of the changes. They want the story to feel *personal*.

But for the most part, cultural heritage institutions condense their own stories of change into 20 to 100 words (or sometimes, unfortunately for the visitor, more) and attach each story to an individual object or place. Of course, across the whole site or gallery, a larger story can be told, but the narrative is dictated by which labels or panels the visitor choses to read, which means any wider narrative can be lost.

There is growing academic interest in non-linear storytelling in cultural heritage. CHESS stands for Cultural Heritage Experiences through Socio-personal interactions and Storytelling, and is a European Commission funded project at the cutting edge of academic research into digital heritage interpretation. "Storytelling is key to the museum experience, so what do you get when you add tech? Curator-led, non-linear digital tales." (Ioannidis, Balet, & Pandermalis, 2014) The project summary says "An approach for cultural heritage institutions (e.g. museums) would be to capitalize on the pervasive use of interactive digital content and systems in order to offer experiences that connect to their visitors' interests, needs, dreams, familiar faces or places; in other words, to the personal narratives they carry with them and, implicitly or explicitly, build when visiting a cultural site." (The CHESS Consortium, 2013)

But papers from the CHESS team reveal that although the project describes innovative aims, their practical realisation has been more elusive. *Controlling and Filtering Information Density with Spatial Interaction Techniques via Handheld Augmented Reality* (Keil, Zoellner, Engelke, Wientapper, & Schmitt, 2013) describes "displaying seamless information layers by simply moving around a Greek statue or a miniature model of an Ariane-5 space rocket." This doesn't

seem to be offering the dynamic, on-the-fly adaptive narrative that was promised. The "personalised" story in *A Digital Look at Physical Museum Exhibits: Designing Personalized Stories with Handheld Augmented Reality in Museums* (Keil, Pujol, et al., 2013), seems rather to be just two presentations of story, one for children (in which, for example, the eyes of the remnant head of a statue of Medusa glow scarily) and one for adults (wherein the possible shape of the whole statue fills in the gaps between the pieces). *A Life of Their Own: Museum Visitor Personas Penetrating the Design Lifecycle of a Mobile Experience* (M. Roussou, Vauanou, Katifori, Rennick-Egglestone, & Pujol, 2013) discusses visitors preparing for their visit by completing a short quiz on the museum's website. When they arrive, their mobile device will offer them a story designed for each of a limited list of "personas." Neither this, nor the stories created in other events (M. Roussou, Pujol, L., Katifori, A., Chrysanthi, A., Perry, A. and Vayanou, M., 2015), is personalisation, but rather profiling (Blast Theory, 2014). Which is not to say that profiling would not be of benefit to cultural heritage interpretation. Heritage organisations already segment their audiences and create offers for each marketing segment. Profiling offers more granularity, and even more targeted offers, but it isn't personalisation – there are still a fixed number of pre-scripted stories on offer.

This is the elusive opportunity for cultural heritage – the stories we tell are from linear paradigm, and the only personalisation that happens is when a visitor misses something out. But is there a way for museums to offer a more personal, more engaging narrative to each visitor in the way that games do?

2.5 Personalisation

I started my career in the heritage sector with live interpretation, which is essentially a conversation that can be adapted to the different needs of individuals and incorporate reactions to their lines of enquiry. Thus personalisation is built into the way I think about heritage; but it has also been the topic of research in the heritage sector.

Not and Petrelli (2018) define personalisation in interactive systems as encompassing three types of system behaviour:

- *customisation* offers users a number of options to set up the application/system the way they like it, for example setting a language

- *context-awareness* is the ability of the system to respond to the current state of the environment including being location aware
- *adaptivity* means the system maintains a dynamic model of the on-going interaction, for example know what parts of a story have been delivered, and which to choose next

Not's definition of customisation (also referred to as adaptability) as "options to set up the application/system the way they like it" implies this is only done at the start of the visit, for example when the user chooses which language to start an audio tour in. But a useful survey and summary of personalisation techniques by Ardissono, Kufik, and Petrelli (2012) shows that this customisation can actually take place throughout the experience. Ardissono's survey charts a history of personalisation since the early 1990's, when hypermedia specialists turned their heads towards museums and tourism, from development of laserdisc based kiosks though WAP (Wireless Application Protocol – which delivered a very basic web service to "dumb" mobile phones) to multi-platform technologies that worked on computers and Personal Digital Assistants (PDAs). To begin with, users often made their choices though screen based interfaces. But as Daniela Petrelli has observed, initially these screen based interfaces were solving a problem heritage professionals only assumed that visitors had: "museums have been keen to use digital technology to deliver large amount[s] of information (all the information that did not fit on the panels) despite the fact that only a minority of visitors consume just a fraction of what is available." (Petrelli et al., 2018) Visitors' choices reflect not a desire for further information but a combination of factors "like age and disability, interests and learning preferences; factors related to the current visit – motivations, fatigue, visit history and available time etc." (Not & Petrelli, 2018)

Not's second aspect of personalisation, context-awareness, involves responsiveness to environment; in projects to-date location seems to be the first nod towards context-aware personalisation. Connecting PDAs to plug-in GPS units enabled location based interpretation (see section 2.6), and highlighted the difficulty of tracking people indoors. This led to experiments in motion-sensing (Petrelli & Not, 2005), wherein "standing for a long time in front of an exhibit indicated interest, while leaving before the audio presentation was over was considered as displaying the opposite attitude." (Ardissono et al., 2012, p. 10) Since then, experiments with a number of other ways of pinpointing the visitor's attention, suggest that movement alone is not as useful as it might be. (Not & Petrelli, 2018, p. 5) describe a "pebble" with NFC capability that activates media

when placed in certain locations around the museum. When the visitor leaves, a final location "reads" the pebble's journey and a personalised postcard is printed for the user to take home. In the Hague, a similarly NFC enabled system has the user place replica objects in "an interactive ring" which plays media from a choice of three different viewpoints (two military and one civilian) (Not & Petrelli, 2018, p. 4). A third project, The Loupe, uses a phone disguised as a magnifying glass to present AR media (Not & Petrelli, 2018, p. 5).

There are disadvantages to concepts like these which oblige the users to learn a new interface. Placing the pebble or replica in a certain spot to activate media may seem unintuitive, especially in environments where conditioned behaviour often precludes touch, picking things up, or even putting things on museum surfaces. On the other hand, Not remarks that "A synergy can be created with tangible and embodied interactions to increase visitors' awareness they are building their own visit path" (Not & Petrelli, 2018, p. 17); and there is one such project where the use of an NFC enabled object really shines. Created for Chester's Roman Fort and The Clayton Museum a Victorian collection of Roman carvings and iconography, *My Roman Pantheon* encouraged visitors to think like a citizen: "in the vestibule the visitor would collect the votive lamp from the shrine; they would have a small number of offerings to take to the altars (marked by stands in the museum); visitors would then have to choose, among the many, which ones they wanted to give their offering to; on returning to the shrine, on their way out, with the now empty offering vessel the visitors would receive their personal 'oracle', a personalised reading of one's character and needs based upon the choices of gods" (Petrelli et al., 2018). This seems to me to be a really effective use of a tangible NFC object, because it does not simply track the visitor's location and context, but it enables the visitor to take on the role of a Roman and to (to some extent) re-create roman ritual practice.

The third system behaviour we need to examine is what Not and Petrelli (2018, p. 3) call adaptivity. Part of this is the way in which information is organised including: "A simple list of objects representing the exhibition as 'visit paths'; text descriptions and 'bag of words' representations of the exhibits on display; 'bag of concepts' representations generated by natural language processing techniques to support a concept-based item classification; and collection-specific ontologies for the multi-classification of artworks, such as location and culture, and multi-faceted search." (Ardissono et al., 2012, p. 13) Another part is keeping track of what the visitors has already experienced, and adapting the remaining content accordingly, and the third is selecting which medium to use. Similar information can be presenting in audio or auditory or video or as text, depending

on the context, and as the environment itself might change, for example by "triggering the vibration of an object or turning on lights. (Not & Petrelli, 2018, p. 15)"

Not's description of adaptivity highlights areas of particular importance to my own inquiry, and especially the issues that may arise in combining personalisation with storytelling and narrative. In describing the organisation of information as a "bag of words" or "bag of concepts" (Ardissono et al., 2012, p. 13) a system may fail to tell a compelling, emotionally engaging story. The "visit paths" of course can tell a traditional story, with objects as illustrations, but that implies that each visit path is scripted by the curators. I don't believe that is a bad thing and indeed (Not & Petrelli, 2018, p. 17) conclude that "fully automatic adaptivity, where the system takes all the decisions on what to present to which visitor, when and how, may not be the best solution" and argues that therefore what curators (or interpreters) value as most meaningful should be the driver of the personalisation model. The challenge is to enable that curatorial input into the "bag" concepts too. "This requires a radical rethinking of how personalisation in cultural heritage manifests itself and the role curators and visitors play" (Not & Petrelli, 2018, p. 17) and I believe that this thesis might contribute to that rethinking.

Of course heritage visits are made as part of a group, more than by individuals, and personalisation by definition is about individuals – yet in most of the projects in this survey, the social aspect was not considered. Not and Petrelli (2018) say "Research that directly addresses the social dimension is still limited" They point the way to studies that look at conversation around a context aware-table, and sharing tables around a group, among others, but more work is needed on how groups make decisions as they explore heritage places. One interesting project demonstrating a social approach to personalisation for emotional impact comes from Nottingham (Fosh, Lorenz, Benford, & Koleva, 2015): an experiment working with eight pairs of visitors to a local art gallery. Fosh enabled one half of each couple to "gift" a personalised tour to their friend/partner. The giver chose five items, and for each chose a piece of music, a vocal instruction to do something, and a personal message, which were combined into a personal "app" that the other then used to explore the museum. Though this was an experiment intentionally limited in scope (the tours were only to be shared with the other half of the pair) it has exciting potential. For example, each segment could be tagged in some way, and stored in a database that could then serve up segments in combinations that the original authors never intended. The choice of five segments that the author originally put together would be unique to that gift, and

never shared in its entirety with another visitor, but segments from a number of givers could be combined in ways that might give other visitors unique, procedurally personalised, interpretations of a museum gallery.

While these are all interesting academic experiments they have been short lived, and have not formed part of any museum's more permanent strategy. There are still challenges to heritage institutions wanting to personalise their user experience, Ardissono et al. (2012) mention for example the plethora of technologies and no standards yet reaching critical mass. Such standards must eventually begin to appear, and the focus will switch to how the curators engage people's emotions though the content they create for such systems.

2.6 Mobile interpretation

Of course cultural heritage stories have been told across spaces for decades. The most basic technology for such storytelling is the guided tour. Audio guides are a perennial technology, starting with linear, cassette-based, guides that instructed the visitor where to go. Later, less linear technologies were created based on CD, or solid state memory, that allowed a user to select a recording based on a location or item number. Then there were systems to trigger recordings automatically using infra-red sensors, and of course now the technologies exist to use mobile phones that know where they are via GPS or WiFi zoning, and to deliver not just audio but other media too. There have of course been experiments try to do more with the computing power now in everybody's hands, to create more personal stories.

In a three-week study by Hewlett Packard and Bristol University around Easter 2004, people could book out an iPaq handheld device and a pair of headphones, and walk around Queen Square in Bristol, listening to a location-based audio drama (or "mediascape"). The evaluation (Reid, Hull, Cater, & Fleuriot, 2005) is based on a good sample, and touches upon the idea of periods of emotional immersion brought about by the experience, which the authors identify as "magic moments."

They can't cite much evidence for the first type they identify - being surrounded by a "sea of voices": one respondent, for example, calls it "quite nice" which doesn't sound very magical to me. But a second type, which they describe as "physical and virtual collisions" is better evidenced. What they mean is the sometimes scripted, sometimes accidental, moments of resonance when what is going on in the audio drama echos the physical world, for example: a seagull flies

by in the real world co-incidentally as one screams in the audio-drama. Or when a name mentioned at one particular location is visible nearby. I think this resonance of real and virtual is also at the bottom of their third type of magic moment, "synaesthetic confusion" when for example, the sound of a skateboard in the real-world is perceived as the sound of bullets by the listener to the drama. It also has something to do with their fourth magic moment, which about the realization that you are in the place where history happened. Without ever using the word then, this paper makes a strong case for resonance as a potential trigger of emotional immersion.

That idea is explored further in an interesting project to create a context-aware interactive experience on the island of San Servolo (Pittarello, 2011). This involved creating a narrative which worked, not just as long as the listener is in the right place, but also only if they are there at the right time and the weather is doing the right thing, so:

> A mad woman of the asylum tells her story next to the sculpture in the park, but only in the afternoons; a piece of classical music - reminder of the music therapy used for the guests of the institution - can be heard by the users facing the south side of the Venice lagoon, but only during the nights characterized by the absence of clouds. (Pittarello, 2011, p. 147)

It's a well-realized attempt to influence some of the resonances that can create emotional immersion in location-based narratives. This isn't quite context aware hypertext. In fact each segment was presented as a short video, so of course, the content of the video didn't change dynamically according to context, but the choice of which video the user was presented with was made by context aware software. The rules that deliver a particular piece of video don't just take into account the place, time and weather: there's also a rule that will block a particular video, if it has already been shown to enough people - the idea being that users are forced to use the social network to share what they've experienced, and to hear about what other users' experience has been. All in all, it’s a location aware narrative that really pushes the boundaries.

One interesting point is that "while the current location value is retrieved from the user device, most of the values of the environmental context are retrieved from different web services." One danger of drawing data from a variety of web-based services is what happens if that service is withdrawn, or even if the providing organisation decides to change their web address? A 2011 paper (Jewell & Hooper, 2011) from Michael Jewell and Clare Hooper, spins an enticing tale of

fiction drawn from your location. But the first two services it mentions, Wanderlust Stories and Broadcastr, no longer exist. The permanence of the web services that interactive projects like these draw on becomes a vital factor in user satisfaction. Cultural heritage organisations will be looking for a product like this to last some time without needing too much IT support, and users won't be willing to wait around while somebody re-codes a bunch of links to restore basic functionality. How can cultural institutions be confident of placing the right bet when it comes to making their content available geo-spatially?

But there is another vital question we must ask. Is there a demonstrable appetite from visitors for the current mode of digital interpretation by mobile device? Dilenschneider (2017) discusses data from her company's National Awareness, Attitude & Usage Study, which is informed by on-site interviews, randomly selected telephone interviews and an on-line component at around two hundred visitor facing clients, including for example, the Monterey Bay Aquarium. It is commercial market research, and not academically peer reviewed, but the approach seems robust. Some of it is not so surprising, when it offers some numbers to support what has already been reported anecdotally. For example, that people are more likely to use the place's website, social media and review sites to plan a visit, rather than an institution's app, or that people are more likely to use social media than an app when they are on-site. Dilenschneider makes two key points

People who use mobile applications onsite do not report significantly higher satisfaction rates than those who do not, and people who use social media or mobile web while they visit a cultural organization have a more satisfying overall experience than people who don't use social media or mobile web during their visit. She illustrates both points with the same graph:

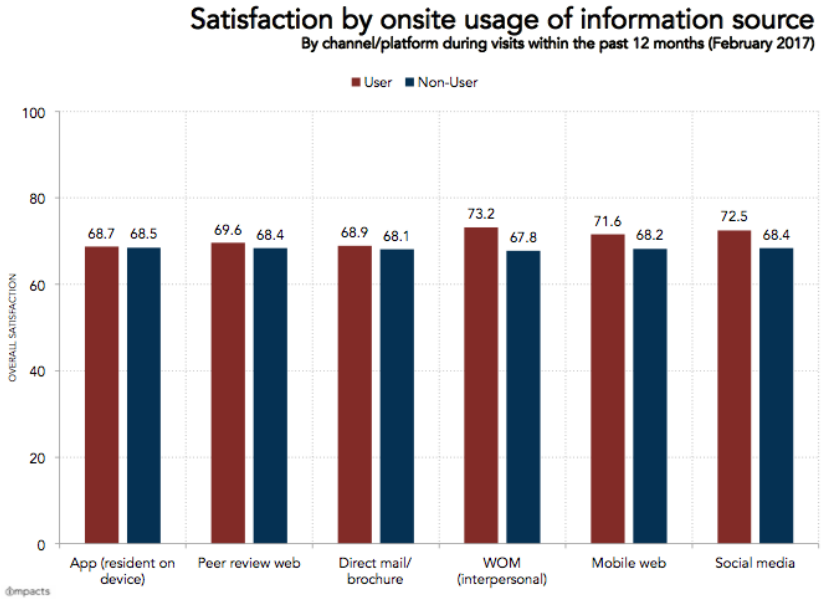


Figure 6 Graph indicating the comparative satisfaction levels of visitors who use a particular information source (e.g. a mobile app) on site and those who don't

(Dilenschneider, 2017)

In the course of my research I collected data (Tyler-Jones, 2018) that suggests the appetite is not (yet) very strong. Respondents to another 2018 study cite many similar reasons for why 56% of respondents (in that study) said a smartphone was their most disliked form of museum interaction. Chief among these reasons was "the use of the phone gets in the way of enjoyment of attending" (Petrelli & o'Brien, 2018, p. 10). Which suggests we should be researching ways to help our visitors keep their phone in their pockets and look up, not down at their device.

2.7 Where is the story?

We have learned that the technology of cultural heritage interpretation has not become much more responsive over the last few decades. Museums and galleries have, it seems, changed more in the decades before the coming of digital than afterwards. The principles of interpretation set more than fifty years ago are still true today. Where designers and academics write about story, what they describe are chronologies, themes and juxtapositions. Narratives are still (for the most part) provided in a very linear format, in introductory videos, the occasional guided tour or maybe guidebooks. Everything else, the interpretation of the objects in a collection, or spaces in a heritage site, is closer to a random access database. Long reliant on the age-old interface of "walking around looking at stuff," cultural heritage providers pass the responsibility for story making onto

the visitor, who must bring a story to the site, or make one up, and then fit what they are looking at and learning into that story. It seems cultural heritage institutions are using digital technology in, broadly speaking, three ways:

1) As advanced, sometimes location aware, multimedia guidebooks or virtual labels, once upon devices supplied by the site, but more and more recently via apps or similar on the visitors' own device;
2) To create or enhance immersive environments; and more rarely
3) To enable their audiences to co-curate learning

The case for the use of advanced, sometimes location aware, multimedia guidebooks or virtual labels (Brown, 2010) seems to be of limited appeal and poor value for money for the institution. Strictly virtual environments, when they need the active participation of the audience to use their device (or a borrowed one) as a window on the past, face similar limitations. Efforts to engage the public in co-curating learning have not, it seems, reached a critical mass, except on social media platforms, where arguably the people are sharing learning and awareness without the active participation of the cultural heritage organisation. But there may still be potential to explore using digital and mobile technology to enhance immersive environments, engage emotions and enable their audiences to co-curate learning on site.

Staiff (Staiff, 2014) argues that digital technology has the power not just to improve interpretation, but to transform it:

> This is not an abdication on my part from the role of heritage interpretation, but a call to re-think it as a platform for negotiated meaning making; for non-linear and non-determined experiences; for facilitating choice and for being able to deal with the unauthorized, the non-conforming, the unpredicted, the subversive, the playful, for imagination, creativity and newly performed responses; for experiences where the power of the somatic, the emotional and serendipitous are acknowledged as possible ends in themselves; for co-authored experiences and meaning making; for experiences that are not necessarily born of the information imperative. (Staiff, 2014, p. 170)

There it is, this is the role of digital technology in our cultural heritage, and so far (for the most part) it has failed to deliver "the emotional and serendipitous" and has shied away from "the unauthorized, the non-conforming, the unpredicted, the subversive, the playful"

We have seen that the cultural heritage industry wants emotional engagement, but does not express exactly what it wants very well; and with good reason, as emotions are not well understood or measured, even by science. When comparing what the heritage industry does to trigger some sort of emotional engagement with what games do, we can find many analogues (excuse the pun) for digital techniques in the analogue world. There are three areas where cultural heritage is not currently taking full advantage of what digital might offer: music, personalisation, and narrative. Indeed, two of these are intertwined: games excel at creating personalised narratives and through that, making the player feel like the centre of the story. I strikes me that a good game has the ability to give its players a "numinous experience" as Latham (Latham, 2007) says, "deeply felt [and] connective." This is what cultural heritage providers want for visitors. It's something which might not be, could not be, perhaps *should* not be, possible every visit, but museums and cultural institutions should be working towards putting everything in place to enable numinous experiences for their visitors. At the heart of that, it seems to me, is a radical change in the way we tell stories.

In the next chapter I shall explore how games tell stories, and what might be learned about telling digital stories in physical places.

Chapter 3: Digital Storytelling

Given that I am exploring how physical cultural heritage sites might replicate the emotional triggers of electronic game narrative, this chapter will explore the relationship between games and narrative which has not, in academic writing at least, been without controversy. Then we must separate the concept of flow, which is possibly the key motivator for playing games, from other emotional responses. Then I shall look in detail at how games tell stories while handing at least some degree of control over to the player. I have selected three narrative focussed games, with very different narrative structures, for the purposes of this study. In this chapter, I shall demonstrate how each game illustrates different hypertext structures that are already being used in locatative narrative experiments. But I will argue that to map the affect of the interactive narrative we also need to consider another game-derived model, Beat and Transition analysis. This could empower responsive real-world environments to tell emotionally engaging bespoke stories.

Although some experiments in affective storytelling are taking place in cultural heritage, the comparatively limited resources of heritage organisations, and the intrinsically risk-averse nature of that sector, means much more development in affective technologies has taken place in gaming. My intention is to discover what cultural heritage institutions could learn from games developers about narrative, and whether the way story is applied to the virtual spaces of games has any relevance to telling stories in the three-dimensional spaces of the real world.

3.1 Are games stories?

There has been some argument as to whether games should be considered narratively at all. *Game Design as Narrative Architecture* (Jenkins, 2004) kicks off with two citations that argue that they should not: “Computer games are not narratives [...] Rather the narrative tends to be isolated from, or even work against, the computer-game-ness of the game.” (Juul, 1998); and, “Outside academic theory, people are usually excellent at making distinctions between narrative, drama and games. If I throw a ball at you, I don't expect you to drop it and wait until it starts telling stories.” (Eskelinen, 2001)

Even though Jenkins makes a case for story and narrative in (some) games, he warns against "something of the order of a choose-your-own adventure book, a form noted for its lifelessness and mechanical exposition, rather than enthralling

entertainment, thematic sophistication, or character complexity." Which suggests that ludic narratives have nothing to bring to heritage spaces. Yet, Jenkins goes on to tempt further exploration, when he introduces "spatiality - and argue[s] for an understanding of game designers less as story-tellers and more as narrative architects." (Jenkins, 2004) He even goes on to explore how story and space work together in the virtual environment:

> A story is less a temporal structure than a body of information. The author of a film or a book has a high degree of control over when and if we receive specific bits of information, but a game designer can somewhat control the narrational process by distributing the information across the game space. Within an open-ended and exploratory narrative structure like a game, essential narrative information must be redundantly presented across a range of spaces and artifacts, since one can not assume the player will necessarily locate or recognize the significance of any given element. Game designers have developed a variety of kludges [makeshift solutions to computing problems] which allow them to prompt players or steer them towards narratively salient spaces. Yet, this is no different from the ways that redundancy is built into a television soap opera, where the assumption is that a certain number of viewers are apt to miss any given episode, or even in classical Hollywood narrative, where the law of three suggests that any essential plot point needs to be communicated in at least three ways. (Jenkins, 2004)

The difficulty of ensuring the audience does not miss key narrative points is one that is shared by cultural heritage spaces.

Despite the radically different and non-linear nature of game design, there are points of overlap between game design and other types of narrative construction. Jenkins is implicitly admitting that narratives often rely on a linearity that can conflict with expectations of interactivity. He makes reference to an essay by Adams in which that author says "the player's participation poses a potential threat to the narrative construction, where-as the hard rails of the plotting can overly constrain the 'freedom, power, self-expression' associated with interactivity". (Adams, 1999) Apart from redundancy, we'll see some of the other "kludges" that open world games use in the next chapter.

Jenkins's article is part of an academic debate in the study of games, between "ludology" (meaning "game studies") and "narratology", which has also spilled into popular culture (Bissell & Ferrari, 2011). Espen Aarseth's paper*, A Narrative*

Theory of Games (2012) both offers insight into the debate (as, it seems, a pretty early participant), and, more importantly, does a reasonable job of debunking the whole thing. Along the way, he demonstrates a masterclass in academic rhetoric, but you can't help but feel it's personal too.

In reality this is not one, but two debates conflated: one is the design-oriented discussion of both the potential and the failings of game-based narratives, and another is the discussion of whether games can be said to be stories. Aarseth points the finger at Jenkins for setting up the two sides of Ludologists and Narratologists. (Although in his own paper, Jenkins appears to point the finger back at Aarseth for coining the word ludology in the first place.) Aarseth argues that pitting one side against the other was "unfortunate, because it obscured the fact that all the so-called "ludologists" were trained in narratology and used narratology in their studies of games." Aarseth argues:

> The "ludologist" position was not, as has been claimed, "to see the focus shift onto the mechanics of game play" but to emphasize the crucial importance of combining the mechanical and the semiotic aspects and to caution against, and criticize, the uncritical and unqualified application of terms such as "narrative" and "story" to games. In other words, the ludologists' critique was a reaction to sloppy scholarship (in which key terms are not defined), one-sided focus and poor theorizing, and not a ban against the application of narrative theory to games as such […]
>
> That this challenge has been mistaken for a ban on the use of narrative theory in game studies is nothing less than amazing, and perhaps goes to show that humanist academics are often less astute readers, scholars and interpreters than their training gives them occasion to presume. (Aarseth, 2012, p. 130)

He continues, "Anyone who echoes Jenkins' misleading nomenclature of "ludologists" vs "narratologists" simply has not read the literature itself." (Aarseth, 2012, p. 130)

I will endeavour not to add any more echoes within this literature review. However, the debate does highlight the differences between games in which the narrative is created purely procedurally and is different every time the game is played, and those wherein a scripted story is baked into the game and the climax at least is similar every time the game is played. Given that cultural heritage interpretation involves the telling of stories that are pre-existing, it seems that interactive stories in heritage sites can't be purely procedural, but must

essentially be scripted. However, the more procedural a narrative is, the more likely each telling is going to be a unique experience for each user.

Apart from the inherent conflict of script and procedure, what distinguishes digital storytelling? As Manovich says “the popular definition of new media identifies it with the use of a computer for distribution and exhibition” (Manovich, 2001, p. 19). Such an understanding, he argues, leads to the somewhat absurd situation where a text or photograph is old media when printed in a book, but exactly the same text or image is somehow transformed into "new media" if distributed via web or e-book or stored on CD-ROM.

Such a definition is too limiting, he argues. To understand new media as a mode of distribution makes it "only" as revolutionary as the printing press. To think of it as a mode of storage renders new media as incapable of transforming culture as the transition from shellac records to vinyl.

The introduction of the printing press affected only one stage of cultural communication - the distribution of media. Similarly, the introduction of photography affected only one type of communication - still images. In contrast, the computer media revolution affects all stages of communication, including acquisition, manipulation, storage, and distribution; it also affects all types of media - texts, still images, moving images, sound, and spatial constructions.

Manovich sets out five "principles" by which we may know and understand new media. (Note that Manovich is reluctant to use the word digital in this thesis "because this idea acts as an umbrella for three unrelated concepts - analog-to-digital conversion, a common representational code, and numerical representation." (Manovich, 2001, p. 52)) They are (in a carefully composed order because after the first, each is a consequence of its predecessors):

1. Numerical representation - We're talking digital media here, and the clue is in the name (whatever Manovich may think). Whether created on a computer, or scanned or ripped from an analogue source, a new media object is a function of numbers. This means that it can be described formally, and can be manipulated algorithmically.
2. Modularity - As every digital object is a number (or series of numbers, or algorithm), elements of every type (sounds, pictures, text etc.) can be assembled into other objects.
3. Automation - As Manovich says "The numerical coding of media (principle 1) and the modular structure of media object (principle 2) allow for the automation of many operations involved in media

creation, manipulation and access. Thus human intentionality can be removed from the creative process, at least in part." This last assertion is arguable, surely human creativity shifts from hard coding the steps into creating a more sophisticated algorithm?

4. Variability - Manovich correlates industrial and now digital media with the ideologies of the industrial and digital age: "In industrial mass society everyone was supposed to enjoy the same goods - and to share the same beliefs. This was also the logic of media technology. A media object was assembled in a media factory (such as a Hollywood studio). Millions of identical copies were produced from a master and distributed to all the citizens. Broadcasting, cinema and print media all followed this logic. In a post-industrial society, every citizen can construct his or her own custom lifestyle and "select" her ideology from a large (but not infinite) number of choices. Rather than pushing the same objects/information to a mass audience, marketing now tries to target each individual separately. The logic of new media reflects this new social logic.
5. Transcoding - Everything that happens to a cultural object in the principles above, creates a new type of object that exists in two "layers." In one, cultural, layer it is the old media object we all recognise, the photograph, the song, the story, and in the second "computer layer" it is a file in a database. (Manovich, 2001, pp. 27-48)

He also says something which resonates with Jenkins above, reinforcing the idea that a study of narrative in space is worth pursuing:

> Spatial montage represents an alternative to traditional, cinematic temporal montage, replacing its traditional sequential mode with a spatial one. Ford's assembly line relied on the separation of the production process into sets of simple, repetitive and sequential activities. The same principle made computer programming possible: A computer program breaks a task into a series of elemental operations to be executed one at a time. Cinema followed this logic of industrial production as well. It replaced all other modes of narration with a sequential narrative, an assembly line of shots that appear on the screen one at a time. This type of narrative turned out to be particularly incompatible with the spatial narrative that had played a prominent role in European visual culture for centuries… All in all, in contrast to cinema's sequential narrative, all the "shots" in spatial narrative are accessible to the viewer at once… the

> tradition of spatial narrative that twentieth-century cinema suppressed will re-emerge. (Manovich, 2001, pp. 322-324)

The spatial narratives to which he refers are carvings (like the Parthenon marbles, Trajan's Column), paintings (like Bosch's Garden of Earthly delights) and stained glass windows. In images such as these, perspective is less important than status and relationships that are often indicated by the size and relative position of figures. These images defy modern expectations of narrative, possibly because linear text was a less common form of communication. Rather stories were performative, and spoken language was the most common medium of narrative. (Harris, 2012) There is a certain irony that such images may once have been "interpreted" much as a docent, or tour guide, might interpret them in a cultural heritage space. I wonder too, in this age of YouTube, Instagram and TikTok, whether we are witnessing the birth of a new literacy, less linear and more visual, performative even, than we've had since the invention of the printing press. By moving around game-worlds to discover narrative (whether the narrative is created procedurally or scripted and left for the gamer to find), the gamer becomes a performer in the story as well as audience.

In fact, games not only force their players to become performers, they challenge the players to perform well. Rob Gallagher, writing in the journal Games and Culture observes: "Video games are unique in the field of consumer software in that they intentionally resist their users, establishing barriers between the operator and their goal." (Gallagher, 2012) Gamers not only have the challenge of seeking out the story in virtual space, they are often presented with obstacles to reaching that story in the form of puzzles or antagonists (most often, since *Space War*, enemies that you have to kill or avoid lest they send you back to the start or a previous save point.)

3.2 Flow

The challenge that games offer players is part of their attraction. It is used by Mihaly Csikszentmihalyi to describe one axis of what he called *Flow*. Describing certain activities as autotelic (auto=self, telos=goal) he investigated why people like rock-climbers do what they do, for no apparent (or rather extrinsic) reward. Many of the people he worked with described feeling as though they were being carried along by the activity, and so the word flow was coined. He set out two conditions for flow: "a sense that one is engaging challenges at a level appropriate to one's capacities"; and, "clear proximal goals and immediate

feedback about the progress that is being made." (Nakamura & Csikszentmihalyi, 2002)

Given those conditions, Csikszentmihalyi sets out what flow looks like:

- Intense and focussed concentration on what one is doing at the present moment
- Merging of action and awareness
- Loss of awareness of oneself as a social actor
- A sense that one can in principle deal with the situation because one knows how to respond to whatever happens next
- Distortion of temporal experience (typically a sense that time has passed faster than normal)
- Experience of the activity as intrinsically rewarding, such that often the end goal is just an excuse for the process

Flow theory has been applied to narrative (Brechman, 2010) and (frequently) to games (Chen, 2007; Cowley, Charles, Black, & Hickey, 2008; Lazzarro, 2009; Sweetser & Wyeth, 2005; Turečková, 2016; Wan & Chiou, 2006). Csikszentmihalyi (with Hemanson) has also applied his theory to cultural heritage, specifically to museum learning (Csikszentmihalyi & Hemanson, 1995). In this extensive chapter, they describe the opportunities for involvement (and thus challenge) to be sensory, intellectual and emotional. But the conditions for flow might be missing from museums, and most often, there is a lack of clear goals. It appears that the solution museums have arrived at is to add a ludic layer to the exhibit, for example with hands-on interactives that might appear puzzling at first, or with quizzes, built into the interpretive text, or offered as a supplementary activity. Fundamentally however, the authors recognise that visitor motivations for making cultural heritage visits are many and varied, and visitor come with varying levels of ability, making it difficult for museums to create conditions for flow across the whole audience.

While flow on cultural heritage visits is complex, it is more easily applied to gamers. Indeed, flow theory offers a glimpse at how gamer's emotions are engaged even, or especially, when the game isn't going well for the gamer. If challenge and capability don't balance, or if neither are high enough, Csikszentmihalyi suggests a range of other emotional states occurs, as set out in this diagram.

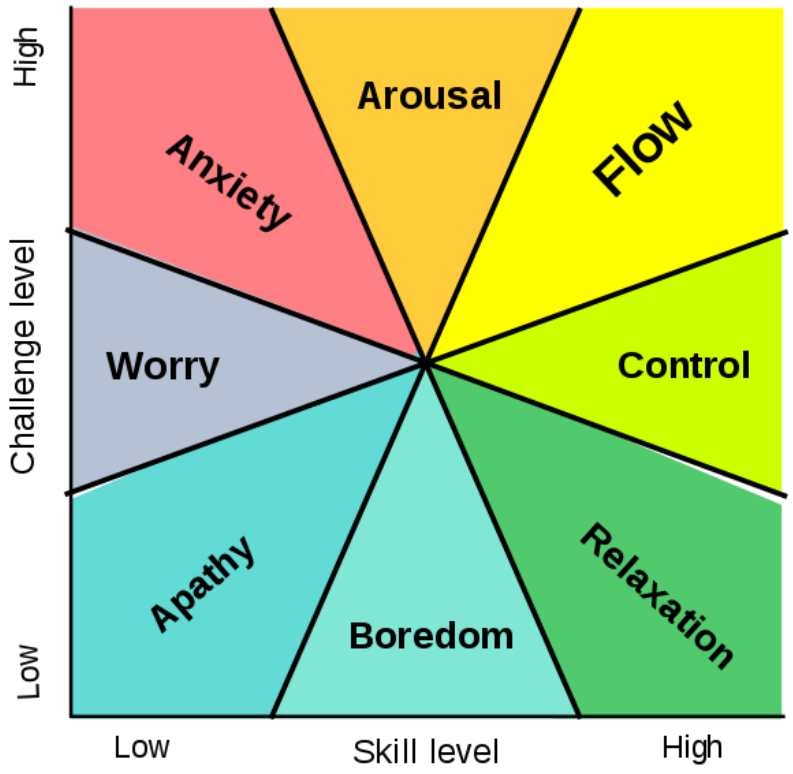


Figure 7 Mental state in terms of challenge level and skill level, according to Csikszentmihalyi's flow model

3.3 Games and flow

However, games may have a far more complex emotional model than Csikszentmihalyi suggests. Nicole Lazzarro studied gamers as they played games and observed:

> ...several aspects of player behaviour not predicted by Csikszentmihalyi's model for flow. Truly absorbing gameplay requires more than a balance of difficulty and skill. Players leave games for other reasons than over-exertion or lack of challenge. In players' favorite games, the degree of difficulty rises and falls, power-ups and bonuses make challenges more interesting, and the opportunity for strategy increases engagement. The progression of challenges to beat a boss monster and the drop of challenge at the start of the next level help keep players engaged. Intense gameplay may produce frustration when the level of challenge is too high, but it can also produce different kinds of emotions, such as curiosity or wonder. Furthermore, play can also emerge from decisions wholly unrelated to the game goal. Additionally players spend a lot of time

> engaged in other activities, such as waving a Wiimote to wiggle their character or create a silly avatar, that require no difficulty to complete. Players respond to various things that characterize great gameplay for them, such as reward cycles, the feeling of winning, pacing, emotions from competition and cooperation. (Lazzarro, 2009, pp. 14-15)

Given that video games are also narratives, and narratives have their own emotional highs and lows, the ability of the player to have some control over the story as a performer, despite a lack control over other, procedural or scripted aspects of the game is an interesting contradiction. Playwright Lucy Prebble is also a gamer, and interested in the potential of games to take the control of narrative elements away from the author, allowing the players to build their own story:

> You piece together a sense of who everyone is and what happened through seemingly disconnected items and evidence hidden around the house. And those connections are intentionally weak. It allows the plot and conclusions to take place in the mind of the player and not in the action of the game... By withholding its story so fully and wisely, *Gone Home* insists we join the dots ourselves. It takes the gaming element away from the screen, and into your head." (Prebble, 2014)

In *The Simulation Dream* game designer Tynan Sylvester (2013b) points out that whatever the model in the computer program, "The whole value of a game is in the mental model of itself it projects into the player's mind". He calls this the Player Model Principle. He goes on to talk about apophenia, the human mind's tendency to project human patterns and behaviours onto non-sentient objects (and in this case, computer animations). Using an example from the Sims, he shows how a story of love, jealousy and murder can be imagined out of a couple of variables in computer code interacting. He discusses how to encourage apophenia in the player, and argues that even procedural games need to be story rich.

> What we really want is not a system that is complex, but a system that is story-rich. [...] Interestingly, real life and most fictional worlds are not story-rich! Most days for most people on Earth or in Middle Earth are quite mundane. It's only very rarely that someone has to drop the Ring into Mount Doom. Follow a random hobbit in Hobbiton, and you'll be bored soon. (Sylvester, 2013b)

By bringing up a story from fiction (though most people nowadays probably know it better from cinema), Tynan addresses an important point. Both media, novels and film, are linear, and direct the focus on a single narrative (even if they use narrative tricks such as multiples stories (*Short Cuts*), multiple points of view (*Rashomon*) or non-chronological storytelling (*Pulp Fiction*). The audience for both media is served the scenes of the story in exactly the order that the author or director intends. Cultural heritage sites cannot exercise that level of control over the visitors' attention. We must look beyond linear story forms (text, film) which currently exert a strong influence (Roberts, 2014) (Falco & Vassos, 2017) on interpretation designers looking to engage visitors' emotions.

3.4 Reading games

Part of the "literature" in this study includes video games, as examples of digital stories set within virtual 3D spaces. As ludologists and narratologists have argued (Aarseth, 2012; Black, 2012; Jenkins, 2004) games deserve such study. To begin the research, I selected three recent games according to the following two criteria:

i. Each game had to have a so-called "open" world to explore
ii. The games had to be critically lauded for having an emotionally engaging story

In selecting the games I also sought some variety in narrative technique: while *Red Dead Redemption* (Rockstar, 2011) offered just one avatar, and a single heavily scripted story, with side quests, *Skyrim* (Bethesda Game Studios, 2011) offered a world with many stories, and the opportunity to start by creating a unique character. *Dear Esther* (the chinese room & Briscoe, 2013) took a third approach: no choices, no quests, but a narrative poetic enough that players would take away their own interpretation of what the story was.

3.4.1 Dear Esther

The first game, *Dear Esther*, was brought to my attention by the academic literature (Pinchbeck, 2008), which, given that it was created as the result of academic study, is perhaps not a surprise; however, it also meets my selection criteria of being positively critiqued and based in an open, if relatively small, environment. It first appeared as a "mod" (fan-created content) for Half-Life (a First Person-Shooter), and which was then released as a stand-alone game. It takes two or three hours of play to complete.

The player starts the game on the shore of a deserted (Scottish?) island, by an abandoned lighthouse. When you start, you hear (and read) a voice over (is it you?) with subtitles, introducing you to the Island and the mysterious Esther. Maybe you are Esther? “The randomisation of the narrative, spread across nearly fifty cues, meant that the experience would be different every time, making it unlikely that the same cues would be experienced on multiple playthroughs, and certainly the combination of cues would be more or less unique.” (Pinchbeck, 2008) The atmosphere as you explore the island is very spooky, without any antagonists out to get you. In fact, the player doesn't interact in any way with the island except by walking around it. Occasionally, upon reaching certain points, the player hears another voice over, about Esther's birth, a car crash, Donnally - who wrote a book that the narrator has stolen from the library and brought with him to the Island - and Paul, who may be the drunk driver who caused the crash, or may be a battered and unreliable car.

The environment isn't quite as open a world as it first appears, and indeed one of the common “kludges” (Jenkins, 2004) that game designers use to exert control over player choices is in evidence here - frustrating dead ends and impassable rocks or fences guide the player down a single path, being fed bits of narrative on the way. The player can't change the ending of this story, but the final scene is a satisfactory ending to an atmospheric, poetic, allegorical tale.

Exploring the narrative structure in more detail, I observed that though there might be diversions from the main narrative path, they are but small distractions that will loop back to put you somewhere close to where you left the main story. You might hear a different narrative segment and wonder if that depends on the path you have taken, but as we know from the creator’s own paper, all the voice narration is distributed randomly on every play. Your interpretation is constructed anew every time you play although, arguably, the interpretation you make the first time you play will exert its influence on subsequent run-throughs.

Of course the narration isn’t the whole of the narrative. The strengths of *Dear Esther* are its atmosphere and sense of place. The locations themselves become part of the story you create. Indeed the random allocation of narration segments may mean your interpretation of them is changed by the location you are in, and what you have experienced prior.

Music plays an important part in the experience. When there's no music playing the sound of the wind, the water and the echo of your own footsteps, maybe even snatches of a (your?) voice, all contribute to the atmosphere for a game wherein

your avatar is alone on an island. But when the fabulous music kicks in your engagement in the scene suddenly kicks up a gear.

I think I felt one distinct jolt of presence (Pinchbeck & Stevens, 2005) while playing *Dear Esther*. It involves an unexpected visit to the M5, a real place in very unreal circumstances. In fact, the unreality of the situation amplifies the emotional engagement with the scene, much as the musical score does in other scenes. For a moment I stopped breathing, forgot where or who I was, and let my emotional surprise take over. For a moment only, less than a second I'm sure, before I remembered to locate the "w" key and press forward to investigate the scene...

It's interesting that apparently adding to the mediation - music, magical takes on reality, etc. - seems to have the opposite effect to what one might presume, it can distract the player from the medium, and immerse you in that narrative.

3.4.2 The Elder Scrolls: Skyrim

The "world" of *Dear Esther* turns out to be just one very small Scottish island. *The Elder Scrolls: Skyrim* (Bethesda Game Studios, 2011) is far larger. Like *Dear Esther*, it starts with your arrival in a strange place in first person view. You can't see who "you" are. But in contrast to the first game, where you never really work out who your avatar is, *Skyrim* soon gives you the opportunity to build your own identity. After a journey on a cart, talking to the other bound prisoners that share your situation (and so discovering though exposition a little of the context of game), one of your fellow travellers asks you directly who you are. Suddenly the camera angle reverses, and the player gets to decide exactly who their character will be, choosing a fantasy race (human, orcish, lizard-man, cat-person), gender, build and facial features. This is an early effort to make the game narrative seem more personal (and unique) to each player. These and subsequent choices about how the character develops, will define how the player will explore the story of the game. For example, cat-people are better at sneaking about than full frontal attacks - so the resulting story will be different to the one played by someone who chooses to play a barbarian.

There is a scripted main storyline, far less random that that of *Dear Esther*, about the rise of the dragons and the return of the Dragon-born. There are also "side quests" which in many games (and especially, as we shall discover, in *Red Dead Redemption*) are another kludge used to give the player the illusion of the freedom and control. But in this game, the side quests don't take the form of

diversions that loop back to the "main" story, as they do in *Red Dead Redemption*. Rather, they are stories that run in parallel, that you can jump into at any point in your exploration (Figure 8[2] overleaf). It is possible to make a decision in one narrative thread that prevents you from pursuing another, which adds to the illusion that all your decisions matter. Six of the quests can extend into a story of their own. It is indeed possible to ignore the main story completely for a time, and find an alternative narrative, with a beginning middle and reasonably satisfying end all of its own.

At the beginning of the game, the player is led towards the main storyline, but could strike out on their own and pick up one of the others. Just two of the storylines are exclusive to each other - the player might find themselves choosing sides in a civil war, and once chosen, the story for those on the other side is no longer accessible. All the stories, once started, are generally linear, with very few branching choices to make. The most notable exception to the linear style is a narrative in which the player's character is invited to join an assassins' guild but can opt to fight them instead.

[2] This, and subsequent, figures in this chapter contain text that is too small to read. This text is an artefact of my note taking during the creation of these maps. The figures are used here to illustrate the overall shape of the narrative structures, not the details of the text. A more interactive version of this map is available here: https://prezi.com/bmynlcomaivc/skyrim/?utm_campaign=share&utm_medium=copy

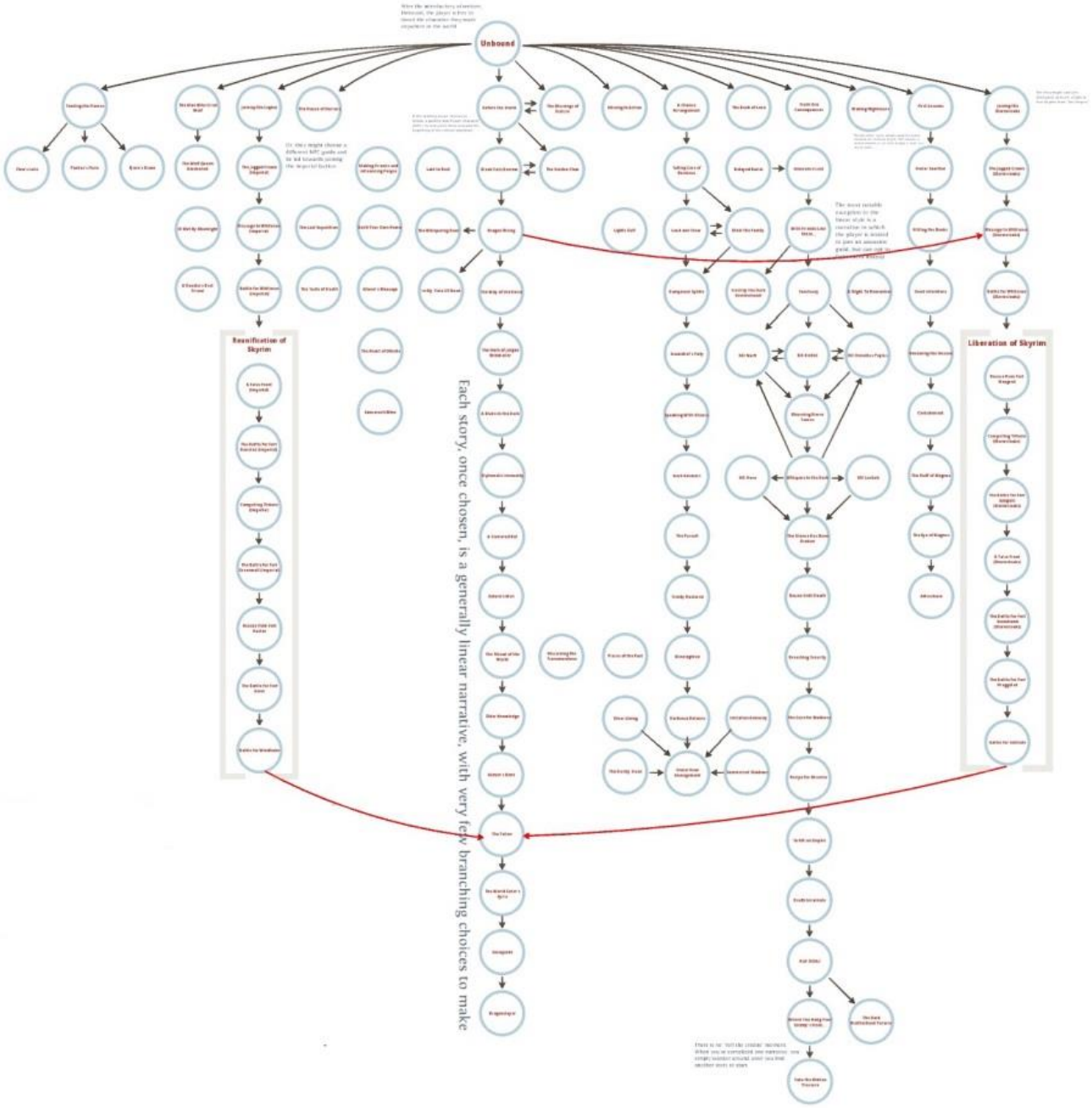


Figure 8 The structure of *Skyrim* is very linear, with very few connections between narratives

Some smaller side quests are generated using the Radiant Story engine which "helps randomize and relate the side quests to players to make the experience as dynamic and reactive as possible. Rather than inundate you with a string of unrelated and mundane tasks, it tailors missions based on who your character is, where you're at, what you've done in the past, and what you're currently doing." (Bertz, 2011). Bertz also highlights the risk of side quests, especially randomly generated ones, overwhelming the main story, and explains that (at the time the article was published, while the game was still in development) the producers of

the game were engaged in reducing the risk of Radiant stories overwhelming the scripted one.

The wiki available for users of the creation kit (Bethesda Game Studios, 2012) explains how it works. The key component is the Radiant Story Manager which "holds the hierarchy of conditionalized quests to start in response to Story Manager Events". Quest Aliases are the "objects" (non-player characters, props, locations) which the quest requires. What's special about the Radiant engine, is that these don't need to be defined as the game is written. They can be defined then of course, but they don't have to be, they can also be chosen during gameplay from a predefined list, or even selected by the game on the fly. If the quest starts with a patron of some sort asking the character to do something, that role could be filled by a character especially created for the task, or whoever is the most appropriate member of the local population, wherever the player-character happens to be. Packages are behaviours, actions that an alias (for example, a non-player character) will demonstrate. Most townsfolk will have a "package stack" that involves them doing their job (whatever it is), eating, sleeping etc at appropriate times of day. But if a character is called to take on the role of a patron for a quest they will be given the required packages by the story engine so that they behave in the right way (for example, crying about a missing relative).

3.4.3 Red Dead Redemption

What all this means is that the stories seem to be more flexible than in *Red Dead Redemption* (Rockstar, 2011). In this, the third game I chose to "read", if an antagonist was killed before he gave a quest, the player would fail that quest, which could frustrate the player, especially given that in one case, the quest objective was to come back and kill the bad guy who'd sent you on the quest.

In play, the story structure is not as personalised at that of *Skyrim*. While apparently exploring a large open world, the player in fact guides the protagonist, John Marston, along a critical path, with the story choices limited to wandering off on a side quest occasionally, or (more rarely) being allowed to choose the order in which to complete a small number of missions, given that all the missions must be completed before the story moves on. The "open world" nature of the game is limited to movement rather than story. Indeed, even movement is limited to begin with, which contrasts with true freedom of movement around the world of Skyrim. The story is told in four "chapters", and

each one reveals a bit more of the world (Figure 9[3]). In the first chapter, the player is limited to exploring the environs of New Austin, and bridges to other parts of the wider world are blocked or half-built. This is another example of the typical "kludge." Upon completion of that first chapter, the player is allowed to explore the "spaghetti western" themed Nuevo Paradiso, and bridges back to New Austin are suddenly passable, allowing John Marston to shuttle between both areas. The third chapter opens up the more genteel town of West Elizabeth, and the fourth allows the player to explore a hitherto seemingly abandoned farm, which turns out to be the protagonist's very own ranch.

Figure 9 The four chapters of *Red Dead Redemption*

Within each of the four chapters, the players can make a number of story choices, but many "missions" are dependent upon completion of a previous one, and only a few are not required to be completed before the player moves on to the next chapter. The most variety and choice appears in the first chapter (Figure11), which contributes to the initial impression that anything might be possible in this game-world.

[3]An interactive version of this narrative map is available here: https://prezi.com/sjeq_qpwjvph/red/?utm_campaign=share&utm_medium=copy

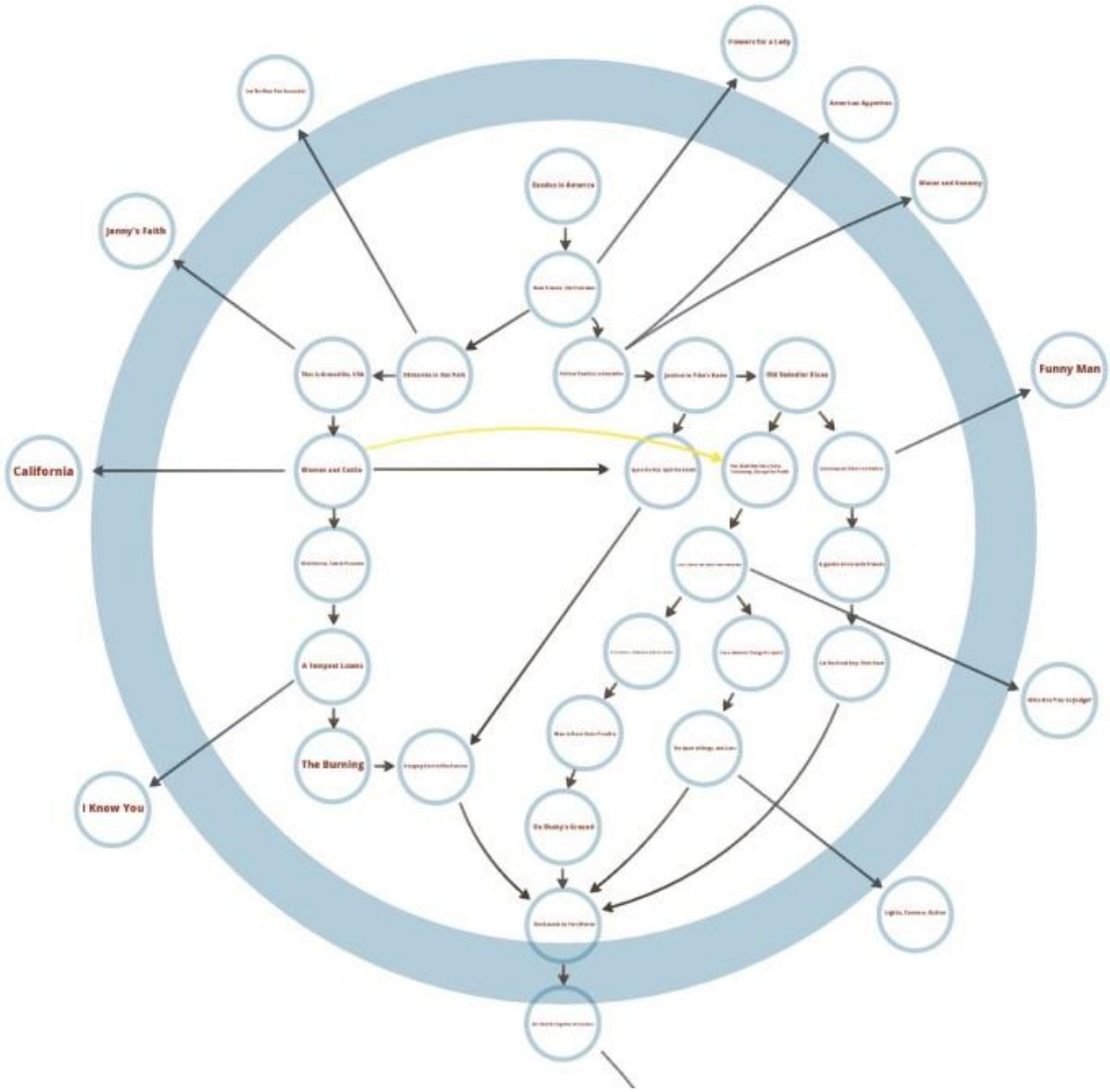


Figure 10 *Red Dead Redemption* - Story choices in New Austin

But the second chapter offers fewer choices (Figure 11)

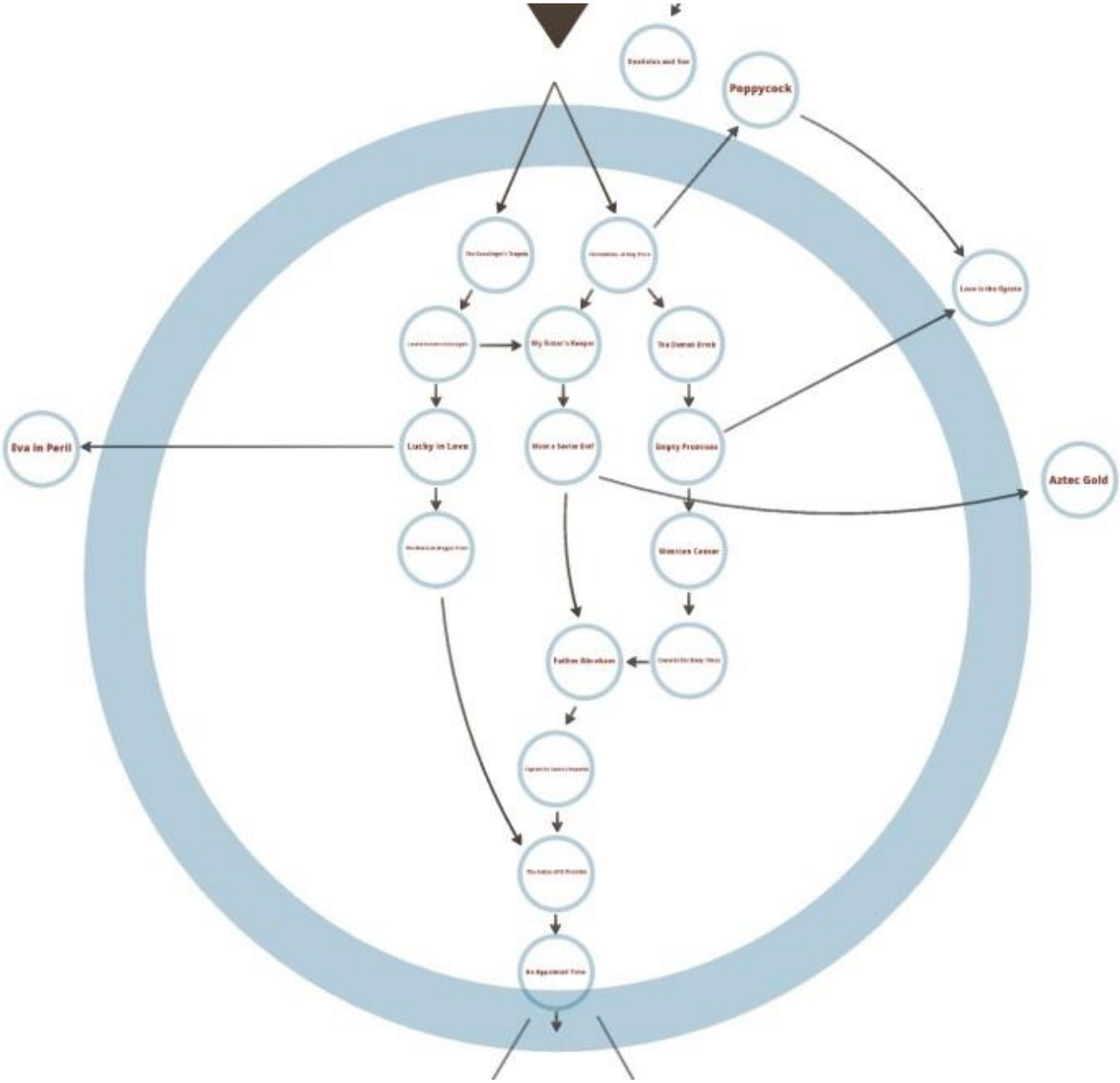


Figure 11 *Red Dead Redemption* - Story choices in Nuevo Paradiso

And the third, fewer still (Figure 12), which has the effect of limiting the interactivity of the story and increasing the pace.

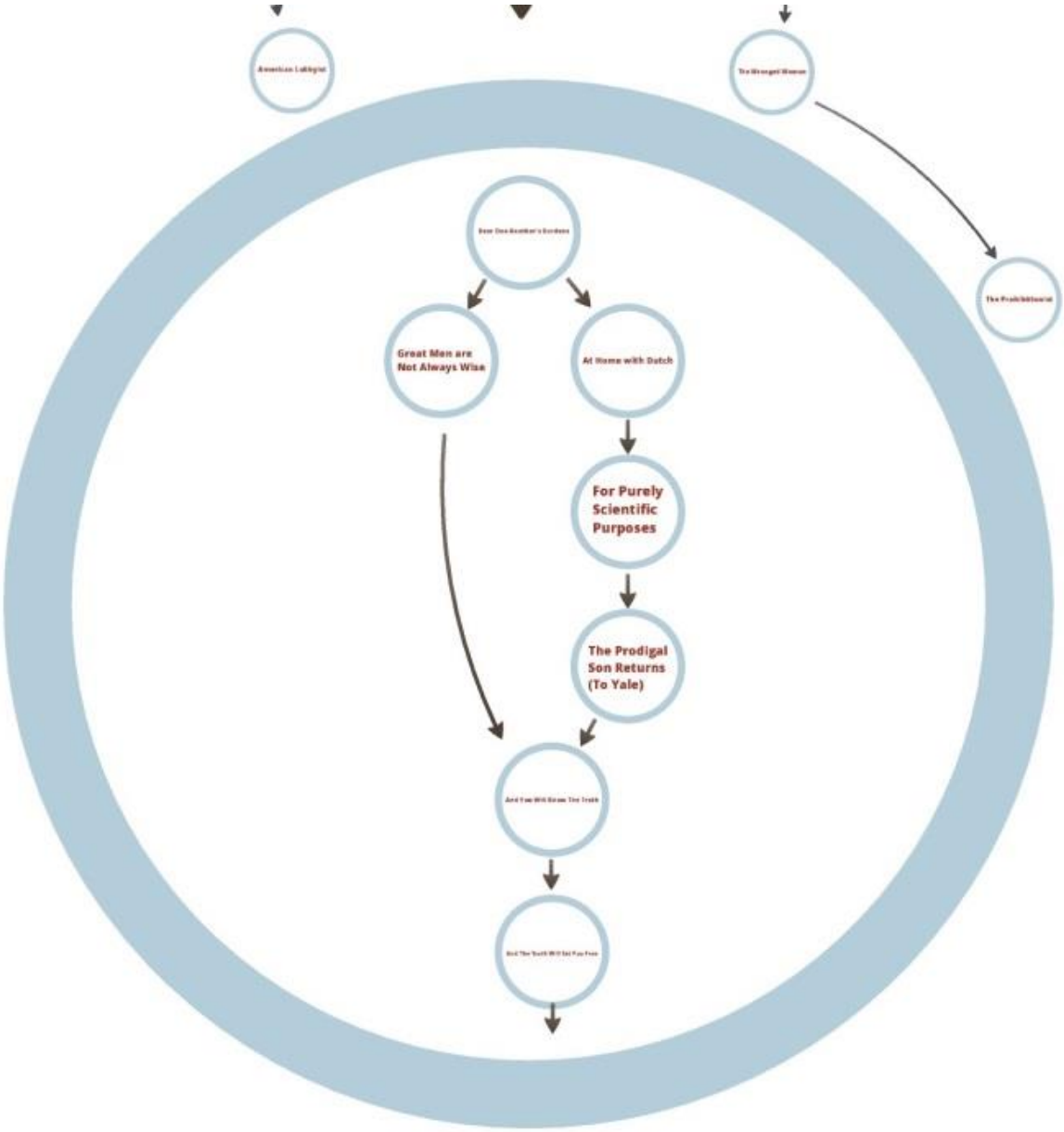


Figure 12 *Red Dead Redemption* - Story choices in West Elizabeth

Chapter 3

The final chapter requires the player to complete three simple paths before coming to a swift conclusion (Figure 13).

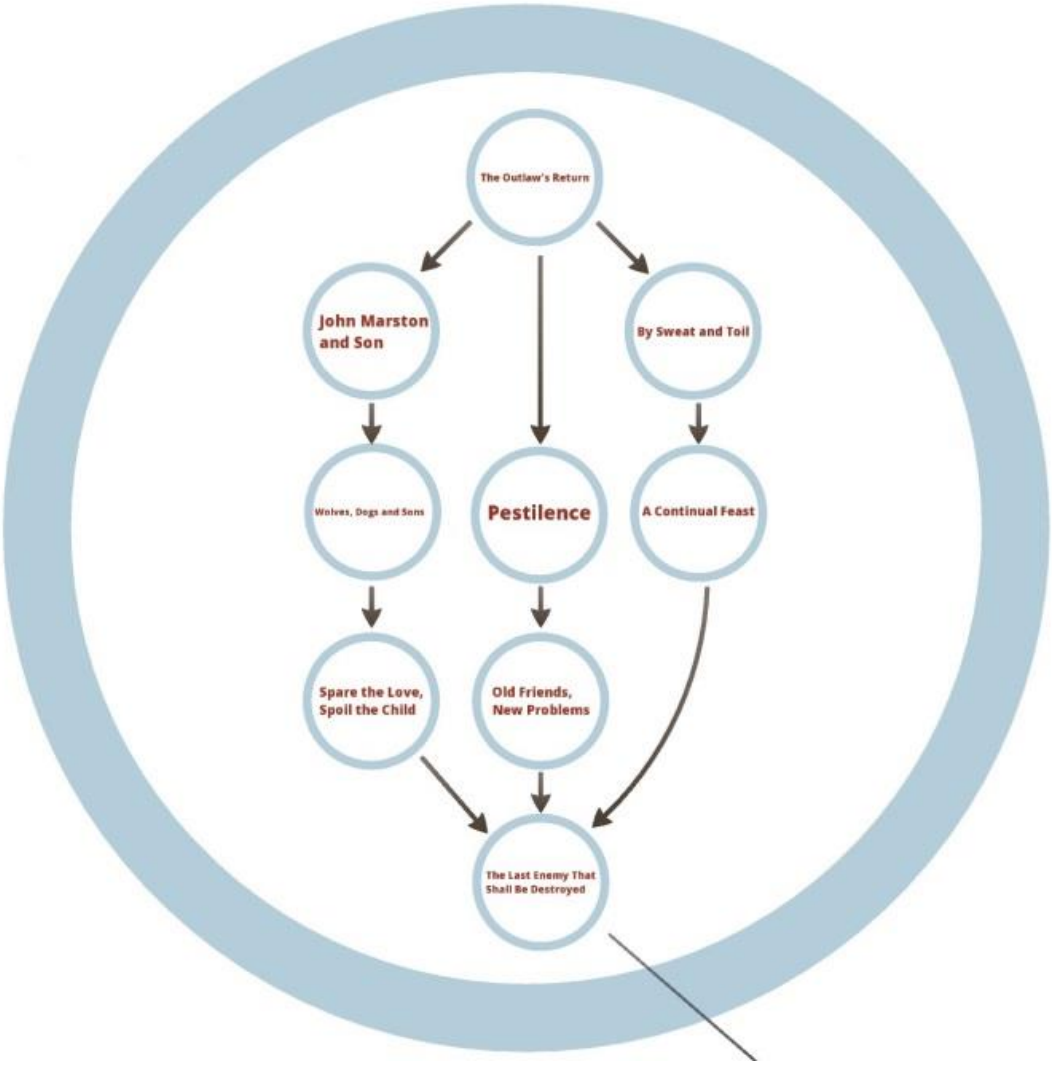


Figure 13 *Red Dead Redemption* - Story choices in Marston Ranch

Some of the missions, helping a grave-robber for example, are so distasteful that players might decide that John Marston is above that sort of thing and walk away. But then the story stops, until the player meekly guides Marston back to the place where the grave-robber patiently waits. There is a dissonance between the morals of the gamer and the character that only became apparent towards the end of the game. Why should the John Marston that I control, do things I don't want him to? It's like when you are watching a scary movie, and as our heroes decide to split up to search the place, or the young woman goes to investigate that noise in the dark, inwardly you are saying "No! Don't do that!" If I were John Marston I wouldn't do that, but of course I'm not John Marston. *Red Dead Redemption* is played in "third-person" view, which is to say that the player's point of view is behind that of the character looking, as it were, over his shoulder (except when using a rifle with sights). I'm watching a character in a game who, just like the

characters I see in movies, or read about in books, isn't actually as moral or as clever as I'd like him be. He tells us so throughout the game, saying things like “I'm many things, most of 'em bad” or "My side ain't chosen. My side was given.”

We don't read books or watch films about people who make the best, the most sensible, choices. Our stories are about people forced to make the choices they don't want to make. Our stories are mostly about conflict, external or internal, physical, social or moral. Our stories are about the desire for (or resistance to) change. The blogger Paul Rissen writes:

> Although he knows he has to be violent to achieve his aims, his real mission is to be a normal man - start a new life as a farm owner, leave peacefully. He’s got the skills of a trained killer, but he’ll use those skills sparingly, reluctantly. And for me, that’s the key thing. Whenever I’m playing the game, that character trait shines through - this is a man who wants to escape the violence. This is why, between missions, I’ll take him wandering throughout the landscape, lost in his own solitude, a chance to blend in amongst the townsfolk, to drink in the saloons, to play Poker and Liar’s Dice, to search for treasure. This is why he’ll ride into the wilderness at sunset, look up to see the stars, and just live the life. He knows he’ll have to return to the main quest, to face his former friends - but he doesn’t want to. He wants to escape all that. (Rissen, 2013)

I am reminded of Rob Gallagher's (2012) assertion that video games are the only software designed to make it harder to finish. Sometimes the challenge isn’t about dexterous manipulation of the game’s controls, sometimes it is about facing narrative elements that you would prefer not to experience.

The player’s goal is to be able to live the noble frontier life that John Marston aspires to. The distaste for the people he has to work with to reach that goal is one of the barriers the designers have put before players. Players must make decisions they'd probably prefer to not make, and so are forced to empathise with the character of John Marston. They are dragged kicking and screaming into emotional engagement with the story.

The other effect that restriction of choice gives the game is a negotiated narrative pace. *Red Dead Redemption*'s timing feels like it is drawn directly from the pages of Vogler's *The Writer's Journey* (2007), but with a key difference over cinema. Towards the end of the game, his enemies defeated, John Marston returns to his farm and family. There follows a glorious summer of herding cattle, breaking horses, and hunting with his son, that (after all the character’s tribulations) the

player wants to last forever, despite the nagging feeling that a denouement is inevitable. Here the game manages something that would be impossible to do in film. This period stretches far, far longer than a film director could get away with, and the player becomes complicit in extending something that would be boring for a cinema audience. There are no side quests in the narrative structure, but there are plenty of other activities. The player can return to uncompleted side quests from previous chapters, hang around in town until somebody steals something for Marston to retrieve or go hunting, finding any job they can to distract from that nagging “mission” icon in the corner, until with a heavy heart, they let Marston respond to his son's call, and the final act.

The experience of playing *Red Dead Redemption*, and analysing its structure, touches upon the subject of the Narrative Paradox (Louchart & Aylett, 2003), which I will return to in Chapter 4.

What is particularly noticeable in this game, but also true for the other open world games I played, is that the world beyond John Marston's range of vision ceases to exist. Or rather, it freezes while he's gone. *Skyrim’*s world is the same, although the designers try to disguise that fact behind their Radiant Engine. If the game were *pervasive*, the other characters would go about their business even when Marston wasn't around. But the grave-robber doesn't just get on with the job, or find some other sap, if the player refuses initially to help, which contributes to the game becoming a little less immersive.

What can heritage sites learn about story from these three games?

3.5 Ludic narrative structure

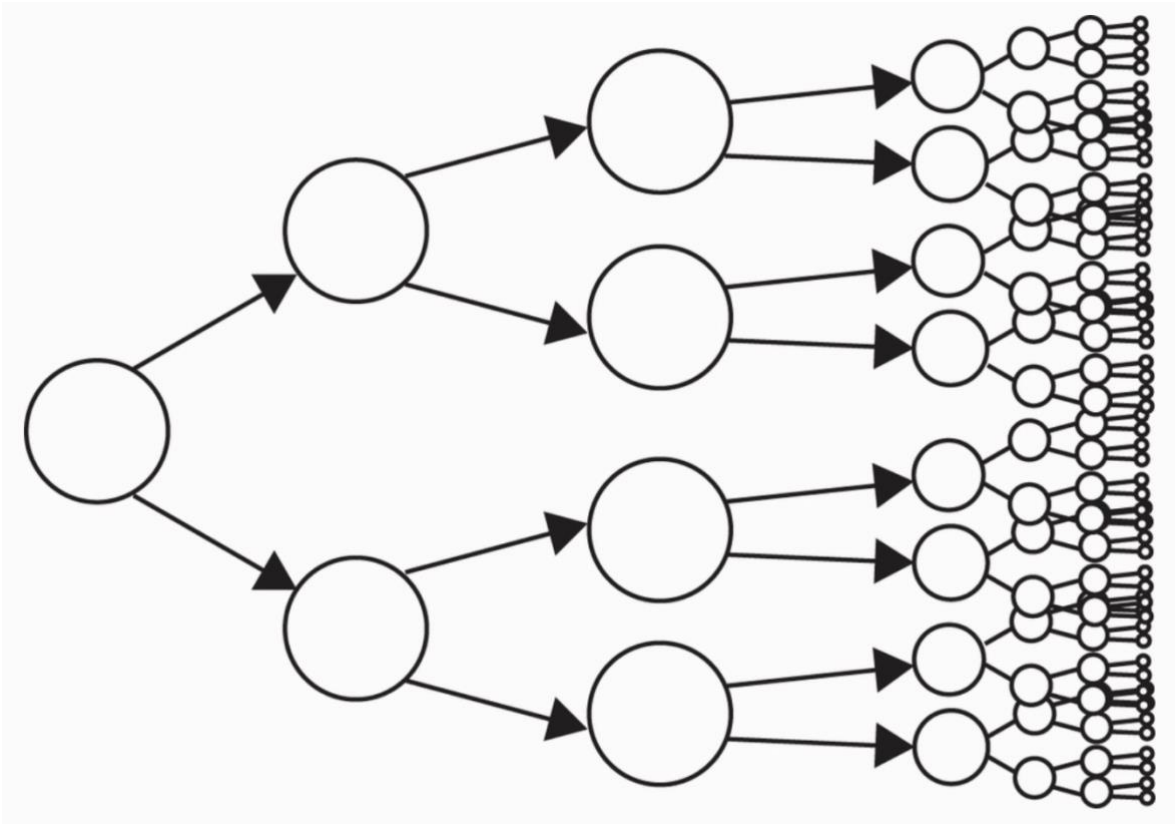


Figure 14 Branching Narratives

(Sylvester, 2013a) Published by O'Reilly Media, Inc. Copyright © 2012 Tynan Sylvester. Used with permission."

Why does *Red Dead Redemption* limit the choices, especially as it nears the end of the game? Why do the various *Skyrim* narratives offer such a straight “stepping-stone bridge” of story? Sylvester (2013a) explains that with a branching path narrative structure (Figure 14), "any given player misses most of the content". There's another problem too - with this sort of structure, it's incredibly difficult to pace the emotional rhythm of the narrative. Christopher Vogler (2007), the screenwriter, uses Joseph Campbell's Jungian analysis of mythic structure to demonstrate how the emotional rhythm, moments of crisis interspersed with periods of reflection, changes pace in the course of a story (Figure 15).

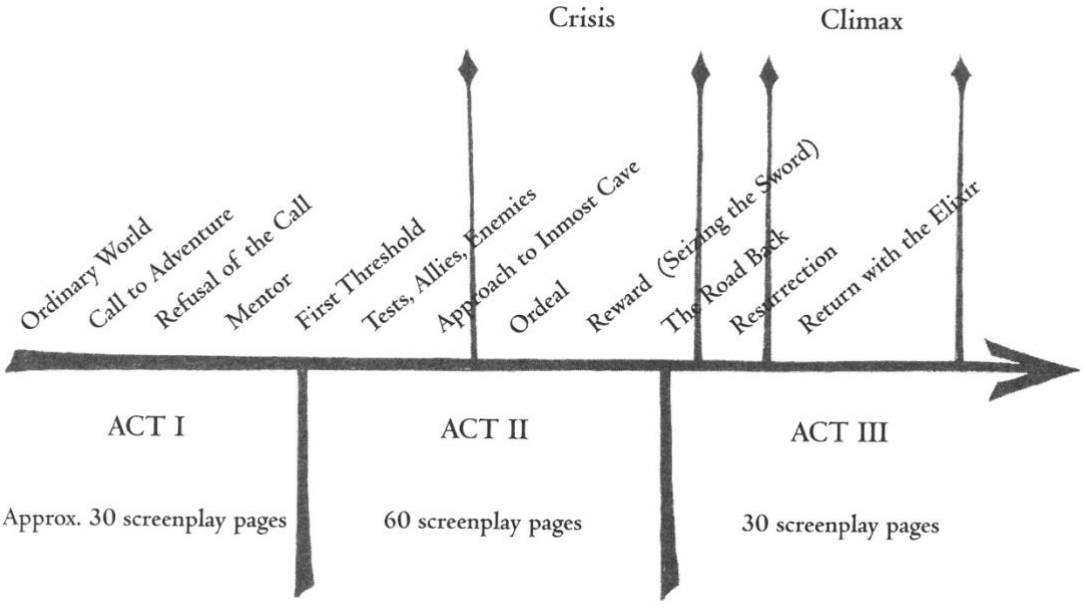


Figure 15 The Hero's Journey Model
(Vogler, 2007) Courtesy of Michael Wiese Productions

In his book, Sylvester draws a curve (Figure 16) that echo's Vogler's model, and describes how such an emotional curve can occur even in an unscripted game.

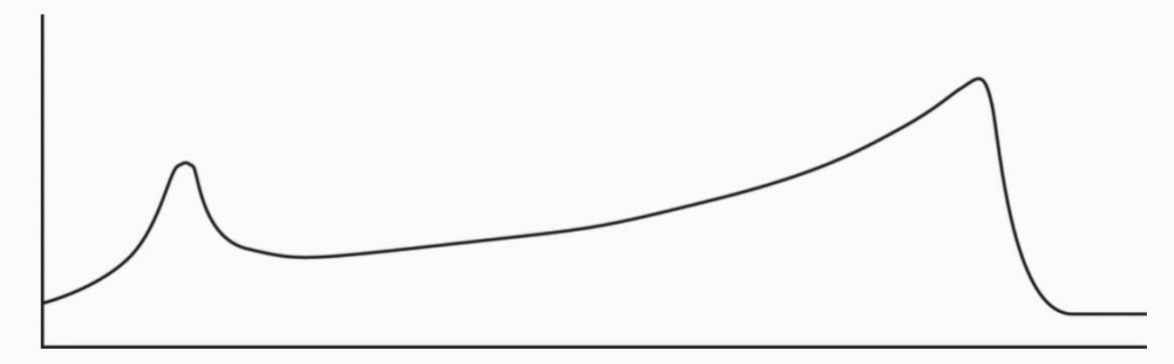


Figure 16 Pacing variation curve

(Sylvester, 2013a) Published by O'Reilly Media, Inc. Copyright © 2012 Tynan Sylvester. Used with permission.

> For example, take a multi-player match of capture the flag in any shooter ... As the timer runs low, the stakes increase, and with them the tension. At the end of the match, the game approaches a climax of intensity as the players try to capture their last flag and turn the game in their favor. Afterward, the players have a few moments to cool off at the score screen. The pacing curve they experienced follows the classic three-act

> story formula, but instead of being predefined, its generated a little differently every game. (Sylvester, 2013a, p. 36)

Sylvester doesn't acknowledge it, but the key phrase in this description is "as the timer runs low." With multiple players choosing from a variety of actions with every event, the narrative path is infinitely branching, but the time limit is a mechanic (in game terms) that forces an emotional climax. It's the same in sport: for example, think of the emotional stress that supporters are under for the final few minutes of a game of football. Basketball is famous for introducing all sorts of timing rules to make the game more emotionally compelling to the audience. Without a mechanic like a time limit the emotional impact of a narrative would be infinitely diluted by the infinite possible endings of a branching structure.

Now, think about the how cultural heritage institutions plan their interpretation. Many follow a model like the one Judy Rand describes (Rand, 1993, pp. 145-149). In such a model, one starts off with the main message, or theme, which she describes as the "single most important idea you want people to leave with." With the theme in place, and informing all the subsequent decisions, one will arrange all the other story elements or messages into three categories:

> A primary message is one that we feel we must communicate to a sizeable number of our visitors (albeit to fewer than the main message)... A secondary message is one we feel we should communicate to the visitors (although we expect even fewer visitors to receive these messages... [and] a tertiary message is one we feel it might be nice to communicate to visitors (but we expect few visitors, if any, to get these). (Rand, 1993, p. 147)

Rand explains that this process is more than an arrangement of the relative value of the messages; it suggests a floorplan, with primary messages becoming sub-divisions of the exhibition, and secondary messages indicating the contents of individual exhibits. But what she is describing, if drawn, is in fact a branching narrative, very similar to that which Sylvester described:

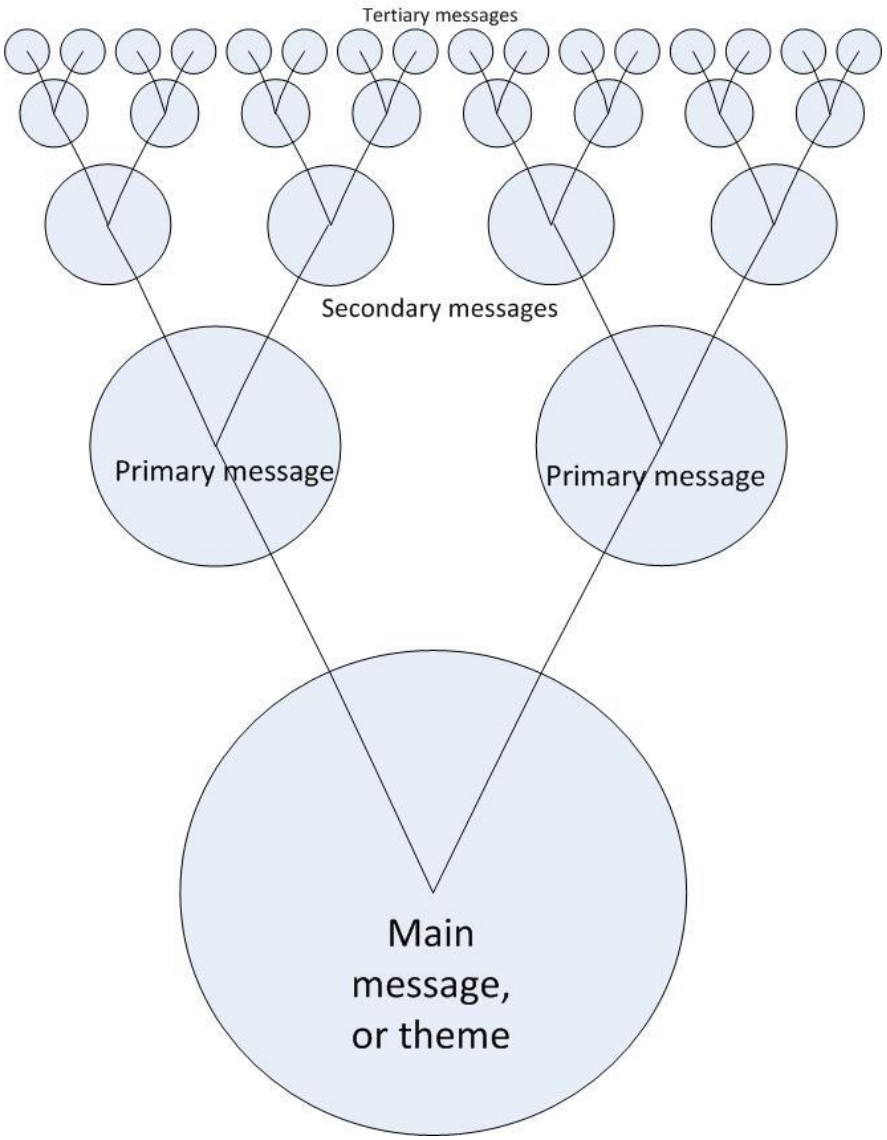


Figure 17 Message hierarchy interpreting Monterey Bay Aquarium

As described by Rand (2013a)

It makes me realise that without the challenge imposed by mechanics like an opposing team and a time limit, this structure sets us up for a narrative with a very dilute emotional climax. What it means, is that by default, museums and other heritage sites frontload the story, revealing the emotionally engaging parts of the story early in the experience, sometimes even in the introductory video. Games, as we saw in *Red Dead Redemption* and *Skyrim* (Chapter 3.4.2 – 3.4.3), and as Sylvester tells us, use side quests and story convergence:

> Side quests put a piece of content on the side of the road, which can be consumed or not, but affects little on the main path. Story convergence offers choices that branch the main storyline, but later converge back to a single line... Often though we need to combine story-ordering devices in a more nuanced way to fit the needs of the game... This hybrid structure is

> popular because it combines so many advantages. The designers get to script a careful introduction which introduces the story and the game mechanics. During the softly ordered central portion, the player feels free and unconstrained. Finally, the game's climax can be carefully authored for maximum effect. (Sylvester, 2013a, p. 92)

But how do we apply that to real world spaces? What are the algorithms that might create emotionally engaging stories procedurally, as people walk around cultural heritage spaces?

Let us start by looking at how formulaic screenwriting can be. The most successful storytelling medium (if measured by the money spent upon it) isn't at all interactive. We have already referred to Christopher Vogler (2007) modelling film scripts on Joseph Cambell's "Hero's Journey", which he used to fix early drafts of the *Lion King*. In *Save the Cat!* Blake Snyder (2005) offers a page by page "Beat Sheet", almost an algorithm for scripting film. The script, he says should be 110 pages long and include: ten pages of set-up including a statement of your theme on page 5; you turn the world upside down on page 12; on page 25 the main character makes a choice and the journey begins; the B-story begins on page 30; 25 pages of adventure; on page 55, the midpoint, there is maybe a success for our heroes, but "the Bad Guys Close In" for twenty pages; "All Is Lost" on page 75 followed by ten pages of "Dark Night of the Soul" for the protagonist; on page 85 act three begins with the B-story providing the solution to the A-story; in the final twenty five pages, the main character incorporates the theme – the nugget of truth that now makes sense to them – into their fight for the goal: and, the final image on page 110 – ride into the sunset, a changed character.

Of course if it was as easy as that, we'd all be writing blockbusters, but it does demonstrate how, in a purely sequential narrative, the emotional beats of a story can be written almost to formula. Cinema is the only medium where the audience gives up control so entirely to the storytellers, however. Even television viewers can at least change channel, and as *Tristram Shandy* demonstrates, readers of novels can flip back and forth within the narrative. In their 2012 paper, Hargood *et al* remind us, "This idea was explored by Calvino as the 'Labyrinth Challenge' where it is explained that the author can only hope to define the maze, not the route the reader takes, and that while some readers will read to follow the plot and get to the end, others will read to find out something in particular" (Hargood, Jewell, & Millard, 2012, p. 2). Games give players even more power to explore the narrative on their terms. However, as Sylvester (2013a) explains, there is a difference between purely procedurally created stories and those with an element

of scripting. Given that heritage sites have curated stories to tell, it's the second type which this study will investigate further.

Interactive narratives, generated or otherwise, suffer from the problem that, as interactivity increases, the author loses control of the shape of the eventual narrative. According to Adams, "Interactivity is almost the opposite of narrative; narrative flows under the direction of the author, while interactivity depends on the player for motive power" (Adams, 1999) This is what Aylett calls the "Narrative Paradox … how to reconcile the needs of the user who is now potentially a participant rather than a spectator with the idea of narrative coherence — that for an experience to count as a story it must have some kind of satisfying structure." (Aylett, 2000)

Allayne (2015, p. 92) also touches upon the Narrative Paradox: "The fundamental issue here is that however defined, narrative text is characterised by a coherence that links human, and non-human agents, their actions, experiences and other happenings into a temporal chain - the following of which leads us to some kind of conclusion. The problem here for thinking about "hypertext narrative" lies in the very nature of hypermedia: unless the author of a hypertext network deliberately imposes a narrative structure on that collection of texts, the collection will have a degree of openness which militates against narrative coherence" using classic text adventure games *Zork* and *The Hitchhikers Guide to the Galaxy* as examples he concludes "Interactive fiction therefore sacrifices the open-ended possibilities of hypertext in order to maintain some degree of narrative coherence."

Seeking to address this paradox, *The Narrative Braid* (Hargood et al., 2012) may be a model useful not just for documentaries, but also for, maybe especially for, cultural heritage interpretation. It suggests dividing narrative elements into their smallest unit, which it calls "natoms," each with enough metadata to enable algorithmic combination into "nolocules", motifs and themes. Similar models such as "micronarratives" are described in games (Bizzocchi, Nixon, DiPaola, & Funk, 2013).

Ip's investigation of narrative in games (Ip, 2010a) takes a similar approach, but draws on a useful source to factor in two distinct classifications of narrative elements. *Telling Stories: A Theoretical Analysis of Narrative Fiction*, feels like ancient history, which shows in chapter one, where defining "narrative" as recounting "a story, a series of events in a temporal sequence," the authors explain that: "our culture depends upon numerous types of narrative: novels, short stories, films, television shows myths, anecdotes, songs, music videos,

comics, paintings, advertisements, essays, biographies, and news accounts" (Shires & Cohan, 1988, p. 1). Games aren't mentioned, and I guess that's no surprise, given that in 1988 computer games were still a relatively youthful medium, and the audience for games were relatively youthful too. The investment of Hollywood amounts of money in game narratives was still a twinkle in programmers' eyes. If they looked at games at all back then, the authors might well have consciously excluded them from their analysis, because, the central premise of their book is "the events making up a story are only available to us through telling", which might (arguably) exclude the procedurally generated narratives that most games provide.

But one of their ideas does have some relevance to game narratives. Ip draws on in this passage

> From the vantage point of a completed sequence, events function either as kernels or as satellites. Kernel events raise possibilities of succeeding or alternative events – what we can call, taking the term rather literally, "eventuality." They initiate, increase, or conclude an uncertainty, so they advance or outline a sequence of transformations. Satellite events, on the other hand, amplify or fill in the outline of a sequence by maintaining, retarding, or prolonging the kernel events they accompany or surround. (Ip, 2010a, p. 54)

In game narrative terms, this is a neat summary of how games work as a storytelling medium. In more scripted games such as *Red Dead Redemption*, the sequence of kernels is quite rigid, and the satellites are optional or even (in the case of games like Skyrim) procedurally generated. I remember nearing the end of *Red Dead Redemption*: I'd helped John Marston, the character the game had been following, to track down and (mostly) kill his old buddies from the gang he had run with, and confront his old boss, who throws himself off a mountain. Marston had been given back his farm, and wife and child, and the game challenges had become less about death and destruction, and more about production and family life - rounding up cattle and the like. Then a blinking icon had appeared on the game map, telling me that I was ready to play the next kernel event.

I didn't want to, I knew the game was nearing the end, and having discovered Marston's life story, I knew it wouldn't end well. I wanted to prolong the rural idyll of farming, hearth and home. I found satellite quests to prolong the current kernel. I became obsessed with beaver hunting, promising myself I wouldn't play on to the next kernel event until I'd found the five beaver skins that a crazy glider

pilot Marston had met in Mexico needed for his glue. I spent days and days hunting beaver. It became a running joke with my wife. But after shooting the first two, it seemed the beavers had gone into hiding. There was beaver drought, it seemed, by every river in the game world - and yes I did try every one. With a heavy heart, I turned John Marston back towards his fate.

But even in purely procedural games, the idea of kernels and satellites works. As Tynan Sylvester points out, in a game like *The Sims*, the narrative is reliant on the interpretation of the player:

> This story was co-authored between the player and the game. The game simulated some simple event (attraction between redhead and roommate), and the player ascribed meaning to it (jealousy and frustration) the same way he might have for the Michotte balls, even though that emotion was not actually in the simulation. The next part of the story was cued by him when he orchestrated the murder. The game simulated the logistics of firey deaths, but the sense of sorrow and revenge was, again, ascribed completely by the player. Most of this story is apophenia – present in the Player Model, absent from the Game Model. (Sylvester, 2013b)

While not talking about games, Cohen and Shires manage to predict how the random calculations of a procedural game can become an emotionally engaging story:

> While kernels may appear to function as primary events and satellites as secondary ones, satellites are as important as kernels to a story sequence. Furthermore, an event's status as a kernel or satellite depends entirely upon a particular sequence and not on the event itself, which does not possess the ability to advance or amplify a transformation on its own. An event acquires its kernel or satellite function for a given sequence through its placement in the sequence, because the sequence is what sets the events in relation to each other. (Shires & Cohan, 1988, p. 55)

What Shires and Cohen are describing here is akin to what Russian Formalist theorists call *syuzhet*. According to Boardwell (1985, p. 50), syuzhet is "not the text in toto. It's a more abstract construct, the patterning of the story as a blow-by-blow recounting of the film could render it." If kernels are the ordered events that make the syuzhet then how would a Formalist define satellites, the *fabula*? It's a little more nuanced than that. According to Thompson (1988, pp. 39-40) the

fabula is the story in the player's, reader's, or viewer's head, what Sylvester (2013b) calls apophenia. There are different views of fabula though, which we will touch on later.

In his second article Ip (2010b) discusses the use of parts of games outside gameplay (the blurb on the box, and introductory video and cutscenes) to deliver the "emotional" content of games. The reliance on such elements to convey the affective elements of narrative is the subject of much scorn from Terence Lee (2013), who argues instead for "emergent narrative", which is to say, procedurally generated.

I like to play *Civilization* (Firaxis Games, 2010), which is an example of an unscripted, procedural game. Some games are more satisfying than others, specifically when the random generation of events becomes, in my mind, the thrilling story of a plucky little nation that could – Thompson's definition of fabula in action! Sometimes, despite my best efforts to manage my nascent state, events conspire to make the game boring - but the advantage of procedural games is that if it's boring, you can start again. Well-designed procedural games are the ones that keep you restarting because of the all the great narratives you've discovered on previous plays. Ones that are consistently boring don't get restarted, they get turned off. The challenge for cultural heritage sites is that they can't be restarted, so a purely procedural approach of interactive narrative would not be constructive. Some degree of scripting, or to use the formalist term syuzhet - systematic selection and ordering of narrative kernels - is required.

3.6 Mapping Narrative

There are somewhat different ways to think about fabula however. In his blog post "The Narrative Structure of The Witcher 3" David Millard (Millard, 2016) calls fabula, "not just plot, but [...] essentially the things in the story (especially the people, places and events)." He goes on to describe the layers of meaning that players of modern video games can explore, such as: characters; places; notes on message boards; posters on the streets; books scattered throughout the world; and "the broken wagons and scattered goods you occasionally find, or elements that build a consistent picture of a world caught between two warring fronts."

Millard claims that computer games do fabula very well, better than other forms of narrative fiction, he says, and you can see his point. The author of a novel (or their editor) must consider just how many words the reader will be willing to read, and balance the detail described with the pace of the story. Modern cinema,

working with resources far beyond a single author, can devote time to creating the fabula in exquisite detail, involving not just production designers, costumiers, typographers etc. but, as in the case of *2001: A Space Odyssey*, for example, NASA scientists and advisers from industry (Frayling, 2014). And yet despite all the time lavished on details, the audience has only seconds, if that, to glance at them, before the film moves relentlessly on. In the case of *2001* and some other classics or cult favourites, a few members of the audience may have spent a greater proportion than most films deserve of the five decades since its release, watching and re-watching, freeze-framing and researching the, say, typography (Addey, 2014). But the rest of us are obliged to focus our attention on what the director demands. In contrast, computer games like *The Witcher 3*, *Skyrim* and *Red Dead Redemption* allow the player to focus their attention on the fabula more freely than any other narrative medium.

Reading Millard's blog sheds some light on what he and his team are attempting with their *StoryPlaces* project - the infinite detail of the real world can become the fabula of the *StoryPlaces* literature.

> As location aware smart devices become ever-more prevalent we will increasingly need to understand hypertexts that are location aware, and that use our physical surroundings and movement as part of the hypertext reading. But despite a rich history of location-based hypertext systems in the research community, most location-aware apps are underpinned by simplistic hypertext patterns (Millard, Hargood, Jewell, & Weal, 2013, p. 9)

Hypertext is of course the basis of the World Wide Web. I find it helps to think of it as a collection of cards with link between them, but Millard has been attempting to reproduce sophisticated location based hypermedia. The thinking behind GeoYarn for example introduced sculptural hypertext:

> Sculptural hypertext is an approach that helps us understand how links in a conceptual space can work. In sculptural hypertexts all nodes are initially linked, and a hypertext is created via the selective removal of links (at runtime) rather than their addition. Thus in sculptural hyper-text links are really transitions in the narrative that are triggered when a reader activates a given node, changing the conditions, and thus revealing a different set of potential nodes (links). (Millard et al., 2013, p. 4)

With this chipping away at links, the users' actions create their own narrative structures, and they don't all have to be the branching sort that Sylvester warns against. Millard *et al* define three topographies of narrative: Canyons, Deltas and Plains.

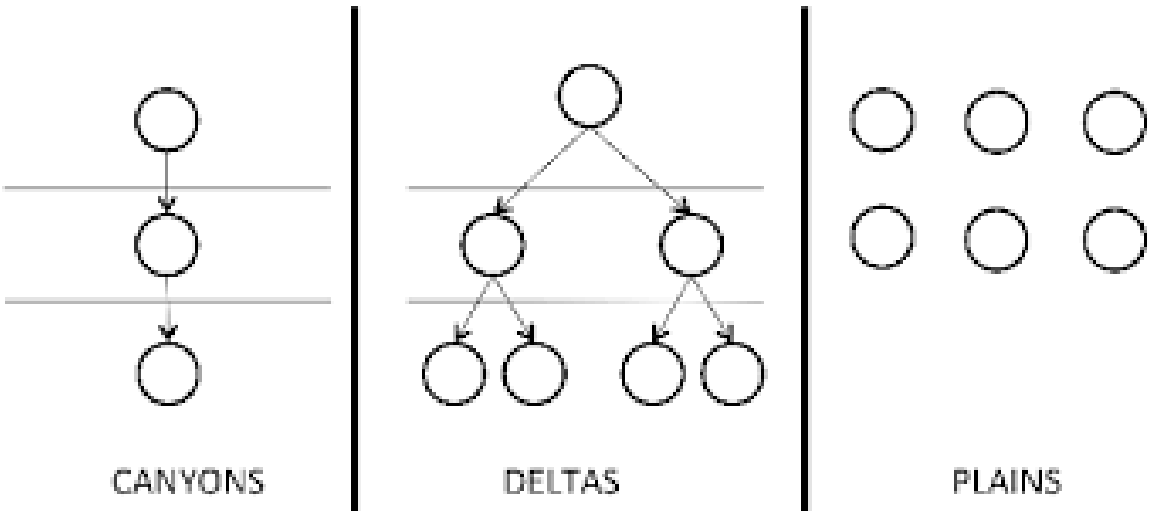


Figure 18 Canyons, Deltas and Plains

(Millard et al., 2013, p. 4)

The delta is the typical branching structure of most interactive media; the plain arguably has no structure at all; but the canyon offers a more linear story structure. Looking back at the three games I played, *Skyrim* featured many canyons, *Red Dead Redemption* more deltas, and *Dear Esther* was more of a plain.

Millard et al. make it clear that all these structures can co-exist and even contain each other, but their key point is that with sculptural hypertext, these structures can change dynamically; the delta can become a canyon, for example, based upon the user's choices and location. The paper describes five applications of locatative narrative, mostly in cultural heritage situations, for example, an application created to augment a school field trip at Chawton House Library (Weal et al., 2007), and another created to "enhance emotional impact" at San Sevelo (Pittarello, 2011). Building on these examples, the authors created a proof-of-concept application *GeoYarn*, which enables the user to navigate stories by changing location.

> Location-queries are implemented as a set of tags that indicate where it should be read. These can be any text, so could be explicit locations ('Big Ben', 'Eiffel Tower'), classes of location ('cafe', 'hotel'), or more abstract concepts ('quiet', 'green'). As an author, it is therefore possible to create a story without binding it to any specific locations, instead choosing to

> bind it dynamically to places with appropriate ambiences. (Millard et al., 2013)

Of course, there is a noticeable absence of *serendipitous* synchronicity. The nodes are played in an order determined by the locations the user visits (and the order of visiting) and which nodes have been played previously. There is little room for serendipitous fabula. For example, I had the opportunity to try out one of the *StoryPlaces*, *The Titanic Criminal* in Southampton, which took me on a walk from the Tudor House, where the devices were handed out, to the area known as Chapel. There my story started on the site of a working man's house on Chapel Street. Even before the story started, I was in "storyspace" on the way to the start point. I'm largely unfamiliar with Southampton, so as I walked I was exploring new spaces. Was it novelty or the idea that a story was about to begin that made everything seem so magical? Or was it the eerily beautiful liturgy sung through the doors of the Greek Orthodox church I passed?

That sound stopped me in my tracks, and I loitered until the verse was finished, but it set up expectations that were ultimately disappointed. I was ready to be blown away by the poetics of space and story, and when I got to the start point, just the other side of a level crossing, even the run-down post- industrial scene that greeted me had a certain ephemeral quality, as I read the story of the houses that used to stand on this spot. This is an example of synchronicity creating fabula that the author could not have planned, making the story unique to me.

Then my phone directed me to a **planned** piece of fabula, the next location, The Grapes, a pub on Southampton's Oxford Street. *StoryPlaces* does not suggest a route, it just shows you the location(s) on a map from OpenStreetMap. I followed it parallel to the railway line a little way, then crossed over a footbridge, feeling very much as though I was on a little adventure. The Grapes has a wrought-iron sign dating from the early twentieth century, which the text of the story pointed out. But at this point I came to realise that this particular story sat interestingly half-way between a narrative based on fact, but possibly fictional, and a guided tour of Southampton. And then the app crashed. The text offered a link to a video on the BBC website, which failed to play, but succeeded in emptying my browser's cache. I had lost my place in the story, and could not navigate my way back to the story without starting again, revisiting places I had already been to. In many games, players are sometimes required to revisit a location to find a new part of the story. For example, in *Red Dead Redemption*, not only are new areas of the map opened up in each phase, but new story nodes might become attached to locations in previously visited nodes.

Though the *StoryPlaces* story above did not intentionally force me to revisit previous locations, some geolocative narratives have experimented with the idea. In describing an experimental story, *The Isle of Brine,* the creators write of *phasing* "where a story progresses through a number of distinct phases, typically nodes which are available in any order within a given phase, with particular nodes transitioning the whole system to the next phase. A typical example would be to support a three-act structure, where each act is a separate phase." (Millard & Hargood, 2016) While gamers might be happy to revisit locations, heritage visitors may be more reluctant. In fact, the *Isle of Brine* features two three act structures running in parallel.

Looking at the figure they provide (Figure 19), most of the story nodes are tied to specific locations. What neither the figure, nor the accompanying text, indicates is whether or not any nodes can be experienced in more than one location. I am interested in both planned and serendipitous juxtapositions of story and place.

While the work of Millard and the *StoryPlaces* team focuses on location, it relies on "synaesthetic confusion"(Reid et al., 2005) - the coincidence of the real world and the story being read to create emotional impact. The fabula of the real world adds depth to the story as written, but in some circumstances it might just as easily detract from the story, or add nothing, as create a magical moment. My "magical moment" outside the Orthodox church, was prompted by my using the app - I would never have walked down that street if I was not heading to my start location - but it wasn't controlled by the app. *StoryPlaces* concentrates on writing for locatative storytelling, but misses the opportunity to explore how writing might influence the experience of all the senses.

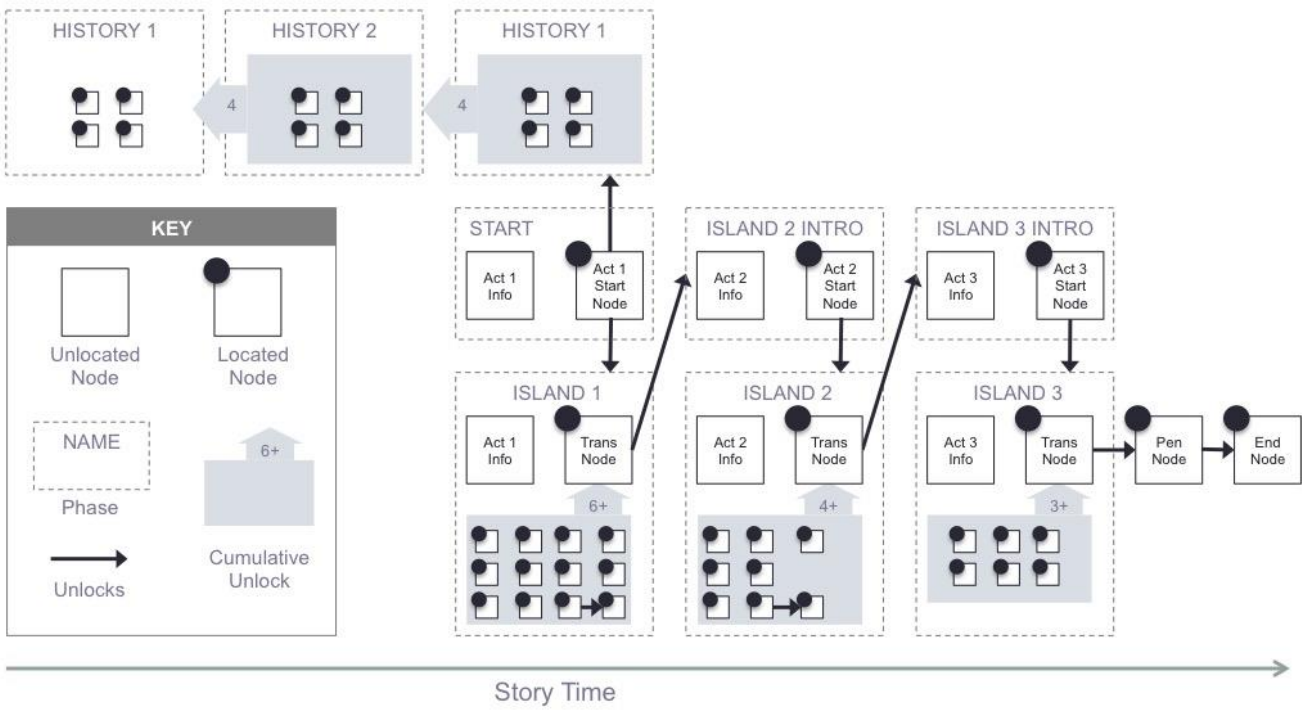


Figure 19 Narrative structure of *Isle of Brine*

(Millard & Hargood, 2016)

Furthermore, *StoryPlaces* requires the user's gaze to be up when approaching a story node (for common sense reasons of personal safety) and down, looking at their device, when experiencing the story. On their journey between locations the user is exposed to all the fabula the real world provides and yet, at moment of reading, only auditory and sensible fabula will break through the eyes-down gaze, and add (or detract, or not actually affect) the story.

And while *StoryPlaces* works hard to map story to place, it does so at the cost of mapping emotional beats. That's not to say that the authors of the stories featured in the project don't take account of emotional beats when creating their stories, but in doing so, they fix emotional beats in particular locations. To get the story beats in the most effectively affective order, the user must choose, or be guided to, the locations in the correct order. If the user has more freedom of movement, the emotional beats of a story may end up in a less affective order.

All of which, it seems to me, works against the interactive nature of this location-based literature. But there could be a way of codifying the emotional rhythm of interactive literature, using some form of metatext to tag each natom with descriptors that define its potential emotional impact. In the next section I will examine a system of analysis already used in games, which has potential to be adapted to this purpose.

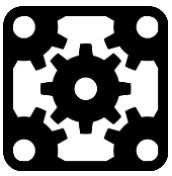
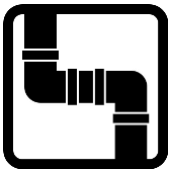
3.7 Beats

In *Hamlet's Hit Points* (Laws, 2010) and *Beating the Story* (Laws, 2017) Robin Laws present a system of narrative analysis that lends itself to interactive stories. He starts with the premise that "Stories emotionally compel us by constantly adjusting audience response toward the positive or negative, shifting us frequently but in an unpredictable pattern between hope and fear." (Laws, 2017) He simplifies the audience's emotional response to every beat (which he describes as its resolution) as being a movement towards one of these poles. If we refer back to my emotional affect and affordances diagram, fear is one of Panksepp's primal emotions, so it seems the opposite pole is care, after all if we care for someone, we hope they will live long, happy lives. Table 1 describes each type of beat in three categories: Foundation Beats; Information Beats; and Flourish Beats.

In Laws's analysis, two types of beats make up the majority of beats in any story, Procedural and Dramatic beats. Dramatic beats occur when two or more characters interact, doing the same for the protagonist's inner goals. "We hope that the beat moves him closer to a positive inner transformation and fear that it might move him towards a negative transformation." (Laws, 2010) In both types of beat, Laws describes two parties, the petitioner, who wants the thing, and the granter, who must be negotiated with. Dramatic beats are mostly actual verbal negotiations, but procedural beats might also be fights, tricks, races or other challenges.

Table 1 A library of symbols representing emotional beats

(part1)

Symbol	Name and Description
Foundation Beats	
	**Dramatic** - beats that show one character pursuing an inner need for an emotional reward, which they seek from another character
	**Procedural** - occurs when the protagonist interacts with a task or obstacle to move them towards or away from, their practical, external goal
Information Beats	
	**Pipe** - a beat that surreptitiously provides us with information we'll need later, without tipping the audience off to its importance
	**Question** – introduces a point of curiosity we want to see satisfied. A question usually registers as a down beat

Continued overleaf

A library of symbols representing emotional beats (part 2)

	**Reveal** – provides the information we were made to desire in a previous question beat, or surprises us with new information
Flourish Beats	
	**Commentary** – where the author pauses to directly address the work's themes or ideas
	**Anticipation** – creates an expectation of coming procedural success, which we look forward to with pleasure
	**Gratification** – a positive emotional moment that floats free from the main narrative. They often appear as rest breaks between major sequences. A musical interlude often acts as a gratification beat
	**Bringdown** – the opposite of gratification

(Laws, 2010) Icons by Gameplaywright LLP and Craig S. Grant, licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License

If we think back to Shires and Cohan's kernels and satellites (see 3.5) *kernels* in a story are likely to be one of these two types of beat. The four which Laws calls flourishes (Laws, 2017) and three "informational beats" might be considered analogous to satellites. But some of them require being encountered in a particular order. For example, Pipe and Question beats must come before Revelation, and Anticipation before Gratification.

The Commentary, Questions and Revelation beats are a feature of much cultural heritage interpretation - a manipulation of facts rather than emotion. However, it could perhaps be said that by provoking questions and revealing answers in the way heritage interpretation often does, it manipulates the emotion of curiosity. Laws explains that literary fiction makes much use of question/reveal cycles to

manipulate emotion, rather than the procedural/dramatic beats that fill genre fiction and thrillers.

In his later work (Laws, 2017) which extends beyond interactive narratives, Laws added transitions between scenes to the mix.

Table 2 A library of symbols representing transitions.

(part 1)

Symbol	Name and Description
	**Meanwhile** - a transition to a scene that takes place at the same time as the previous scene, but with different characters in another place
	**Flashback** - moving us back to a previous time
	**Flash forward** - moving the action to a moment in the future
	**Return** – concludes a flashback or flashforward and the action returns to the main timeframe
	**Outgrowth** - a beat which arises as a direct consequence of the previous beat

Continued overleaf

A library of symbols representing transitions (part 2)

	**Continuation** - where the scene stays with the focus character and they pursue the goal that they were pursuing in the previous scene
	**Turn** - where the scene stays with the focus character, but they switch to another goal
	**Break** - which switches the focus to a different character
	**Viewpoint** - which brings in a new viewpoint character for the first time
	**Rhyme** - in which two scenes that would otherwise be separated by a break, achieve a sense of matching harmony though the use of a common sensory cue

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In his analysis of a number of works Laws uses these icons, and Up, Down, Level or Crossed arrows, to graph the emotional beats of the narrative. He compares the maps created with charts like Vogler's (see 3.4) and notes that the lines his analysis creates are "flatter overall. It tends to resemble a stock tracker measuring the progress over time of a slowly deflating security [...] Even stories that end happily [...] tend to move downward over time." He explains that narratives build up fear with numerous incremental steps, before sudden uplifting moments of hope. In most stories, there are simply more down beats than up beats, given that the up beats are more intense. I think there is also a point that Laws misses (or takes as read): in many of those narrative curves, as in Vogler's, the absolute value of emotional intensity is being measured, with no thought as to whether the emotion is hopeful or fearful.

However, the shape of the chart matters little. I am more interested in the possibility of tagging natoms - narrative atoms, the smallest units of story - with emotional beats which can then be used to procedurally select which natom gets

played in a particular location. For example, if the user experienced a hopeful "up" beat at the previous location, the system might tend towards selecting a "down" beat, rather than another up or a lateral beat.

3.8 The Apotheosis Moment

What have we learned from this survey of games and ludic narratives? Firstly, that digital games take some, if not full, advantage of Manovich's "new media" principles to tell their stories. They automate the storytelling process, putting together modules that can be purely algorithmic in procedural games, or more scripted in the own world story games that I played, in an order unique to the players' choices and (in open world games) their "movement" around the virtual spaces of the game. Thus the principle of variability – every playthrough is different, in effect, *personalised*.

The principle which games have not yet taken full advantage of is transcoding – though it could be argued that the Western tropes of *Red Dead Redemption* are themselves cultural objects, and so their representation in data in the game is a *form* of transcoding. But as we discussed in Chapter 2, with "mixed reality" there is a mostly untapped opportunity for games to transcode *real world* cultural objects, with games like *Ingress* and, more successfully, *Pokemon Go* which are only just beginning to bring locatative games to mass attention. *Pokemon Go*, adds a relatively simple layer of monster hunting to reality, but again, it is a personalised experience.

Secondly, games put obstacles in the way of discovering the story. When that challenge is too hard, players might get frustrated, put the game down and never explore the story. When it is too easy some players might put the game down through boredom. But as I discussed (section 3.2) when the level of challenge matches the player's ability, they find themselves in the state of "flow," The concept of flow has been applied to cultural heritage experiences by numerous authors, not least Csikszentmihalyi himself (Csikszentmihalyi & Hemanson, 1995) and more recently Latham (Latham, 2016), who attempts to apply Csikszentmihalyi's ideas to her numinous museum model, and finds that "the numinous experience is a type of flow experience in the museum."

Given my experience of playing the games themselves, wherein I felt more often like a god, controlling and observing the characters, rather than inhabiting them, I am struck by Latham's explanation of where the word "numinous" comes from. She cites Rudolf Otto's 1958 book *The Idea of the Holy* where the word *numen* is

used to describe an “an emotion or experience that can be awakened in the presence of something holy.” (Latham, 2007, p. 3)

This in turn reminds me of a rare disagreement I have with Erik Champion. He says “Playing in a digitally simulated world can leave the feeling that the virtual world’s entire causal mechanics rotate around the player” (Champion, 2015, p. 1716) as though that’s a bad thing. But in fact I’m coming to the conclusion that that feeling “the Apotheosis Moment” is something special about games, which in a way, I’m trying to recreate in physical cultural heritage environments. I want to make the visitor the “God” of their own story. Not quite putting them in the place of the protagonist, whose choices were made years ago, but both watching and controlling the story as it develops.

All of this has me thinking about “ambient interpretation”. One might argue that interpretation is pretty ambient already - some people choose to read interpretive panels, and others choose to ignore them. The display of cultural heritage does not rely only on text panels in any case, the positioning of objects in relation to each other, or the creation of whole-room presentations, is a form of interpretation that visitors choose to engage with to a greater or lesser degree. Where text panels, or encapsulated room-cards in galleries and National Trust sites (among others), do exist, they persist whether the visitor engages with them or not.

But there are some aspects of the ambient model that intrigue me:

- the idea that interpretation is ALWAYS in the background, yet a visitor can pull it (and by it I mean, not a guidebook to leaf through, but *the* most relevant, contextual interpretation to where they are, what they are looking at) into the foreground as soon their interest is aroused;
- the idea that visitors might participate in the creation of interpretation, even when they have little interest in doing so. I think what I'm getting at here, is that they are not actively contributing, but that their attention, their presence in an area, even, as they pursue their own interests, informs the interpretive schema in some way. The easiest analogy might be on-line shopping, whereby looking at items, I'm affecting what other shoppers may see, as well as what items might be brought to my attention in future.;
- the idea that interpretation might be persistently changing;
- the idea that ambient interpretation is always contextual (of course) but also manipulates the visitors' emotions; and
- the idea of discovery, and shared discoveries.

Eyles' *Pirate Moods* game has the most obvious application in Cultural Heritage interpretation - in a museum environment, full of text panels, the addition of an RFID tag that collects data as the visitor wanders around reading the panels could at the very least track what the visitors is most interested in, and deliver deeper levels of interpretation, based on what the visitor has seen so far. This is where the idea of a responsive environment begins.

3.9 A Responsive Environment?

Is it possible for the cultural heritage sites to organise their corpus of interpretation into “natoms”? Museum and heritage sites already consist of both persistent and ephemeral narrative atoms (or “natoms”). Persistent natoms include the objects and the collection but also the spaces themselves, either because of their historic nature, or their configuration in relation to other spaces (Hillier, 1996). Ephemeral natoms are media including, but not exclusive to, lighting effects, sound and music, audio-visual material, and text.

All of these natoms comprise the “curated content” of any exhibition or presentation. The physical natoms are “always on,” and in most museums and historic sites, so are most the ephemeral natoms, the text panels stay the same, the background music plays the same loop, the videos repeat themselves endlessly until the end of the day. But could curators identify among all those natoms the satellites and kernels of a narrative? Because if they could, then could they also deliver those natoms in a responsive way? Not via a hand held device, but via the environment itself, much in the way that the games discussed in this chapter do?

At this juncture my path forward is clear. I intend to experiment in delivering a story procedurally, but with some control over the order of kernel natoms. The intention is to see if I can procedurally produce a story that does not suffer from the narrative paradox.

I realise at this point that there are already algorithms that can do such a thing, string facts into stories on-the-fly and, at their best, responding to the visitors’ changing interests. As I suggested in Chapter 1, these algorithms are found inside the brains of really good tour guides.

Imagine then, a visit where you don’t have to wait and join a guided tour, don’t have to carry a multimedia device around with you, and you can leave your phone in your pocket, but instead can wander freely and let the place itself tell you a personalised story. Imagine objects that might interest you being lit up as you

enter a room. The text on object labels changing as you approach, so what you read builds on what you've already read. The music you hear reminds you of something you discovered in a previous room. Imagine portraits speaking to you, explaining how the sitter features in the next chapter of the personalised story that you are uncovering. Imagine the moment when you realise the story you are experiencing is personal to you, that all around you other visitors are uncovering other stories, as the place itself responds to your, and their individual needs.

Of course such a utopian vision begs questions. How does the environment track you around the place? Can you only have such an experience on your own or would it work for groups? What happens when visitors with conflicting needs enter the same space? But I am looking forward to when all these questions can be answered.

The technology to do this isn't quite here at a cost affordable to cultural heritage institutions yet, but GeoYarn and other academic papers demonstrate that it is on its way. Mobile Location Analytics are already being used the track customers around some shops, and GeoYarn is just one of many procedurally generated narratives.

Whist GeoYarn and its ilk are delivered via mobile devices, the algorithms that drive them could be used in a different way, making use of mobile devices only to track the location of the users, but delivering the content through the environment itself.

3.10 Summary

This chapter has taken us on a long journey, pulling together a working model of ludic affect, and the emotional triggers that are apparent in cultural heritage as well as in games. I have identified two gaps where it seems cultural heritage has the most to learn from games – music and, somewhat surprisingly, storytelling. I have many colleagues who, I am sure, would be offended to read that cultural heritage isn't telling stories as well as it might, but I am looking not at what we can do with the current media, but rather what might be possible in future, and how games might help us design stories, or the *parts* of stories – narrative atoms, that will enable places to respond to the movements and interests of their visitors.

In the next chapter, then, we will explore a number of experiments in creating affective emergent narratives in responsive heritage sites.

Chapter 4: Experiments in adaptive narrative

This chapter will consider and evaluate experiments in adaptive narrative, applied to cultural heritage sites. I begin by reviewing and evaluating two pre-existing interpretations - *Ghosts in the Garden* and *The Knight's Peril*; that were being offered to the general public at two sites.

Having evaluated these recent experiments in locatative interpretation, I describe two of my own experiments in creating adaptive narrative: *A Walk Among the Ruins*, a personal response to the fire at Clandon Park and *Untours* at Chawton House Library. Both of these are presented, not as finished pieces, but as proto-typing – exploring the opportunities and difficulties of adapting historical interpretation to game style locatatative narrative. For each, the chapter describes the thinking behind the experiment, the methodology and the learning from the process. Finally, I analyse several tours generated at Chawton using Beats and Transition techniques described in Chapter 3.

The final experiment, indeed the whole thesis has been shaped, not only by the constraints of what can be reasonably accomplished within the timeframe of a PhD project, but also by my background as a heritage professional and the perspectives and needs of the particular part of the sector in which my professional career is framed. The part of the sector of which I have most experience is that which deals with at the conservation of historic places, including countryside, archaeological sites, and in particular historic houses. In many such places (although by no means everywhere) the collection came with the house, and is displayed as though the original owners had just stepped out for a walk. Rooms are displayed as living spaces, not museums, and as such there are very few if any labels or panels. Claisse, Petrelli, Dulake, Marshall, and Ciolfi (2019, p. 1) explain, historic houses present particular challenges to heritage interpretation: "Due to this unique layout, they need to be understood from an experiential perspective: 'stepping back in time' or 'standing in someone else's shoes' are evocative terms used to describe visiting such museums." It is a rather sweeping but often true generalisation. The collection is often specific and original to the place where it is exhibited. "Spatial and aesthetic constraints mean curators have to choose which part of the story of the house is presented to the public. Thus house museums tend to concentrate on a single period in their history where both the building and its interiors are restored or reconstructed to match a particular era or episode in time." (Claisse, Petrelli, et al., 2019, p. 1) This has become a dangerous habit in my sector. In places where fewer original

furnishing and contents are to be found, managers are tempted to create domestic settings with leftovers from other places and even purchases. In recent years, there has also been a tendency to constrain interpretation planning around one linear narrative and one leading character. At larger places like Hampton Court Palace, the whole can be divided into different areas, each of which focuses on a different character - Henry VIII on one, side William III on the other, for example. But in most smaller places the whole interior focusses on a particular period. Often digital technology is seen as a solution that would allow enterprising heritage professions to create layers of alternative presentations across the site, which offer more interactive narratives and more periods of the place's long history.

My project is an exploration of this hypothesis from the practical viewpoint of a heritage professional charged with creating content for such a system. For several decades I have been creating content for a variety of sites, but there are challenges for cultural heritage professionals who move from older forms of content creation into digital creation. The first is a lack of expertise. Like most practitioners, I have been trained to write interpretively, but not interactively. Heritage professional are trained to write text for labels and panels in museums or guidebooks in historic houses but not so much for interactive interpretation. There are few aids in the literature as Ardito et al. (2018) observe: "Very few contributions […] address the possibility of enabling CH experts to shape up smart visit experiences"

The second challenge involves lack of resources. Academic experiments in interactive interpretation frequently involve large teams and may have substantial financial and technological resources at their disposal. I am sure the team-members on projects such as Marshall et al. (2015), Ardito et al. (2018), Economou et al. (2018), Fenu and Pittarello (2018), Petrelli et al. (2018) Schaper, Santos, Malinverni, Zerbini Berro, and Pares (2018) and Claisse, Petrelli, et al. (2019), felt that their projects would have benefitted from greater resources, be that more money, more time from technicians or more people on the team. But compared with day-to-day resources available to most heritage professionals working at most cultural heritage sites, the academic project resource teams are comparatively well endowed. In the National Trust for example, each curator is responsible for a number of places and collections and usually has a limited number of hours per week to devote to particular projects. The places themselves may have dedicated staff, some with "visitor experience" in the title - but their roles involve a significant proportion of operational work and their time for creative activities is limited. Some places make effective use of volunteers either

as a dedicated respect team, or for the creative process as described in (Claisse, Dulake, & Petrelli, 2019), but this still requires a dedication of time that many heritage professionals will struggle to provide. For that reason, I find the limited resources (of time and money) that I can put into this project, while working part time and without any external funding, to be very similar to the position of a heritage professional asked to create content for a new technology.

I cannot claim that the data collected in my experiments is either comprehensive or empirical. The availability of empirical visitor data for cultural heritage interpretation has often been a problem in visitor studies. A literature review of cultural heritage projects claims that despite being "peer-reviewed and published in important journals and conferences, it was possible to identify several failures in the quality of reporting on empirical evaluations" (Nikolakopoulou & Koutsabasis, 2019). The authors also note poor reporting on the number of users that participated in the evaluations in many papers. I expect that is because, due to the time taken to observe a visit, the number of participants is statistically small – small enough to put into question whether the studies are "empirical" at all. Although many sites evaluate their visitor satisfaction with surveys, these are seldom specific enough to measure the effect of a particular part of that experience.

There is also a very real barrier to properly empirical work in heritage sites - it is hard to recruit subjects, especially given people's different motivations. Nikolakopoulou and Koutsabasis (2019, p. 27) point out that "recruiting visitors to experience or assess CH content on-purpose changes their original purpose of visit, which is something inherently connected with the visitor experience discussed in several museum and visitor studies." Whatever motivations the visitor had for coming when they left home are superseded by the request to be part of the study. Within the constraints of a PhD project, it has not been possible to overcome these hurdles to produce an empirical study. The value of this research is instead in the exploration of context, and in my own experience as a heritage professional experimenting with interactive narratives.

4.1 Ghosts in the Garden

Ghosts in the Garden was an experiment that aimed to tell primary sourced historical stories with a simple choose your own adventure style game. In 2012, the Holburne Museum in Bath worked with games and culture technologists Splash and Ripple to create a ludic interpretation of the Pleasure Grounds (now a

public park) that surround the museum. Visitors, as a group or individually, could borrow a device to eavesdrop on late Georgian activities in the Pleasure Grounds.

Figure 20 *Ghosts in the Garden* - One of the Holburne Museum's "recently discovered" Listening Devices

The devices were dispensed from one of the old metal museum crates in which they were "recently discovered" (Figure 20). Visitors are asked whether they'd like to hear about the balloon or the fireworks, and once a choice is made, the device is calibrated and then lifted out of the crate and handed to the visitor. At this point the complex clockwork inside the box is ticking loudly, almost as though it's a bomb about to go off, and one has a sense of apprehension, clutching the surprisingly heavy little box as the safety strap is lifted over one's head.

Then the visitor is sent out into the garden to see if they can pick up a signal. As they approach a set of gates, the box vibrates and emits strange noises, and through the aether they can hear a distant voice. The signal becomes clear, and Monsieur Merlin, a Francophone inventor and showman, celebrates his success in reaching into his future and our present. He explains that, with the box, the visitors are able to wander the gardens and pick up snatches of conversation from the early nineteenth century. He even implies that their presence as observers might change the course of events. He suggests some Georgian features of the garden to visit. Sadly most of these structures no-longer exist, but the thoughtful museum staff also provide a map, indicating where they once stood.

Soon we are embroiled in a story of unrequited love and forced labour, or meeting unsavoury characters and helping them sabotage a fireworks display. Though we don't fully understand the Georgian technology at work here, it seems that M. Merlin's invention somehow resonates with moments of high emotion, as visitors hear nothing of the ordinary humdrum life of the gardeners, or the dowager ladies taking the air in the park. Between the locations where dramatic, emotional scenes took place, all they can pick up are brief snatches of music and one or two words, heard almost as if underwater.

The historian behind the game (Poole, 2018) describes three ways in which digital technology has been used: "as an augmented guidebook and information resource, as a tool for enhanced simulation, and (less frequently) as a tool for changing the rules by which we construct and define historical knowledge at heritage sites." This last was the aim of the *Ghosts in the Garden* project, which makes it a useful comparator for my research. Their intent in creating the experience was essentially ludic:

> The Ghosts in the Garden approach to heritage interpretation adapts some elements of first-person computer games like Call of Duty and Medal of Honour; most notably in its attempt to subjectively immerse visitors in a past reality in which they are called upon to make decisions that impact upon outcomes. (Poole, 2018, p. 309)

How does Poole propose that the use of gaming philosophy "changes the rules by which we construct and define historical knowledge at heritage sites"? It is the ludic nature of digital storytelling, the seeking and finding of fragments of story that put the visitor into the historian's shoes, rather than perceiving the historian as an impeccable authority:

> Yet what most sets historical analysis apart from other forms of enquiry in the arts and social sciences is the fragmentary nature of the evidence around which historians build interpretative frameworks, the material irretrievability of past events (and people), and the inevitability of supposition, argument and disagreement. Construction, in other words, is as necessary a concept to historians as reconstruction. Accepting that history is a practice in which knowledge is crafted from often incomplete evidence challenges the authoritative basis on which explanation is conventionally built. Arguably, moreover, presenting the process of making history as a craft rather than the knitting together of a series of

> factual certainties offers the heritage industry an opportunity to engage audiences in dialogue with the past. (Poole, 2018, p. 302)

Poole's intent is to explore "history from below", drawing on (in this case) local court records for the histories, rather than the sort of *great man* history that has dominated western culture. Indeed, the stories of the common men and women of Bath were "more important to the project's purpose than using technological gadgetry to retell familiar tales about elite social space." Poole acknowledges that the ludic nature of story construction means "the experience was built as much around an imaginative world as a historically accurate one" but argues that the magical technology of M. Merlin's time radios makes the audience aware of that, and that while "it was important to the project that its narratives were based on researched archival evidence, the stories did not carry the consequential gravitas of those used in World War battle games and there was little danger of any factual inaccuracies compromising public understanding of its objectives." To make the historical sources explicit and counteract the imaginative theatre of the Georgian time radios, each participant received a leaflet at the end of the experience which explained the historical research behind the stories.

Ghosts in the Garden was running just as I was starting out on my own "choose your own PhD adventure", and with the kind help of Steve Poole's collaborators on the project, Splash and Ripple, and the staff of the Holburne, I observed and surveyed a small but comprehensive sample of visitors during the second run of Ghosts in the Garden, thoughout June 2013. I supplied the museum with a self-completion form (Appendix A) to be given to each participating group on completion of the experience. The museum returned 39 completed forms, representing every one of the groups who took a device into the gardens, and 97 participants in total. Both Splash and Ripple, and I, were somewhat disappointed at the take up of experience. Had I realised such a small number of groups would participate, I might have chosen instead to observe more groups and use interviews to explore their reactions.

Only one respondent didn't have an enjoyable time at the museum, though that was apparently nothing to do with the Ghosts in the Garden experience, which they would strongly recommend to friends. Thus 97% of the respondents reported an enjoyable or very enjoyable visit to the museum as a whole. I asked this question so that I could compare the results of the survey with data from the National Trust, and so used the same wording and five point Likert scale as that organisation uses. Apart from the one party who had a "not enjoyable" time, the respondents were evenly split between enjoyable and very enjoyable, which

means that the "Very Enjoyable" score (the KPI that the National Trust used at the same time) was 46%. This is low compared to most National Trust properties; Bodiam Castle, for example, achieved a score of 61% in 2013. More local to Bath, Prior Park also scored 61%, Dyrham scored 51% in 2013, and though it didn't collect data in 2013, in 2014, the National Trust's Bath Skyline property scored 75%. Because the Holborn Museum did not use a similar visitor survey at the time, we can't compare the score taken while Ghosts in the Garden was on, with any measure of enjoyment taken at a time when the experience was not available. It may have enhanced, or negatively affected the experience for visitors, but there is no evidence that it did either.

For most of the other questions, I asked participants to rate how strongly they agreed with a number of statements about the experience, using a seven point Likert scale, for example, "The Ghosts in the Garden experience added to my enjoyment of the visit today" (Figure 21).

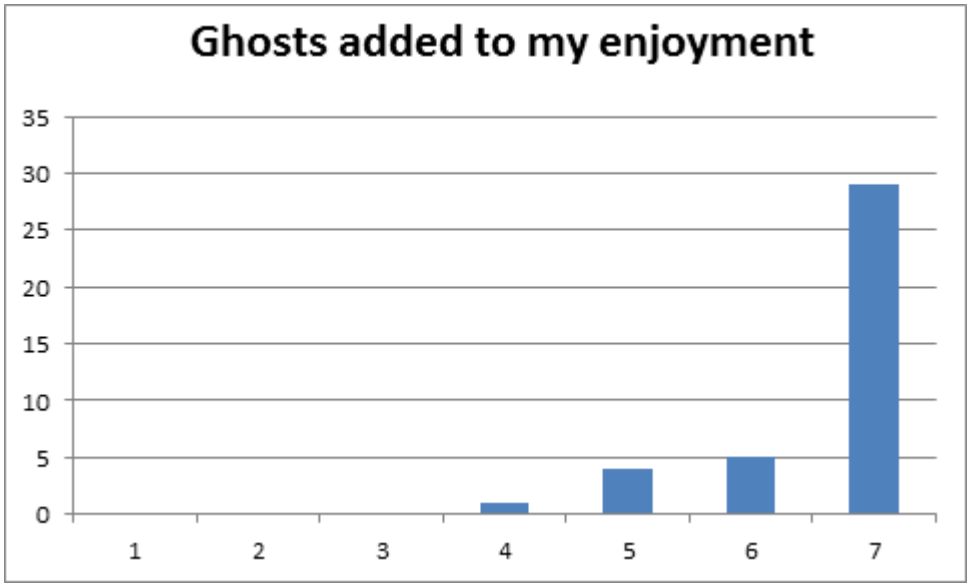


Figure 21 *Ghosts in the Garden* Responses to whether the activity "added to my enjoyment"

Which is very nice and positive, but I'm looking for emotional engagement, and the responses to the statement "The story I heard had a real emotional impact on me" were less positive (Figure 22). Most users were non-committal about emotional engagement, and some did not agree that the story had any emotional impact

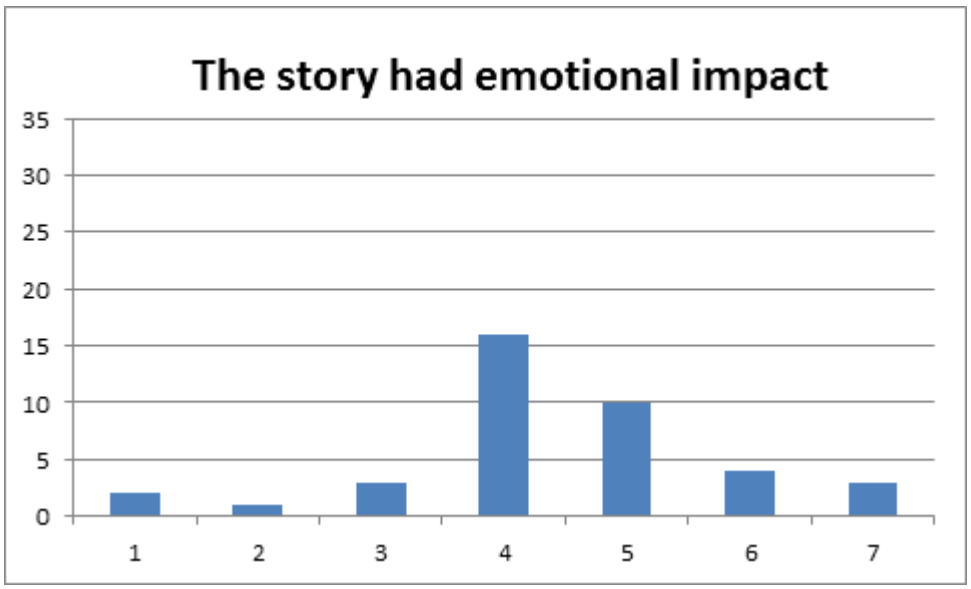


Figure 22 *Ghosts in the Garden* Degree of agreement with "The visit had a real emotional impact on me"

It is possible that this was not the right question to ask. I used this wording only because, again, a similar question is asked at the National Trust and without comparable data from other periods at the Holborn Museum, I could use National Trust data as a comparator. (Some of the National Trust's most emotionally engaging places get something over 20% of visitors ticking the top (rank seven) box, in this sample, only about 8% did.)

Asking people to rate their emotional response is according to many (Reddy) a futile task, and there are likely better ways to measure it, but allow me to pursue the idea for a moment - if I can assume that the story was not as emotionally engaging as it might be, I might ask myself "why not"?

Ghosts is the Garden has been described by its creators as a "choose-your-own-adventure style story." When you pick up the "listening device" you make your first choice – balloons or fireworks – and then, at every point you are offered a choice of locations to explore, and the narration explains that the choices you make will affect the outcome of the story. And yet when we asked users whether they agreed that the choices they made changed the story, quite a bit of scepticism was evident. A number of people agreed that the choices they made changed the story, but more were less convinced (Figure 23).

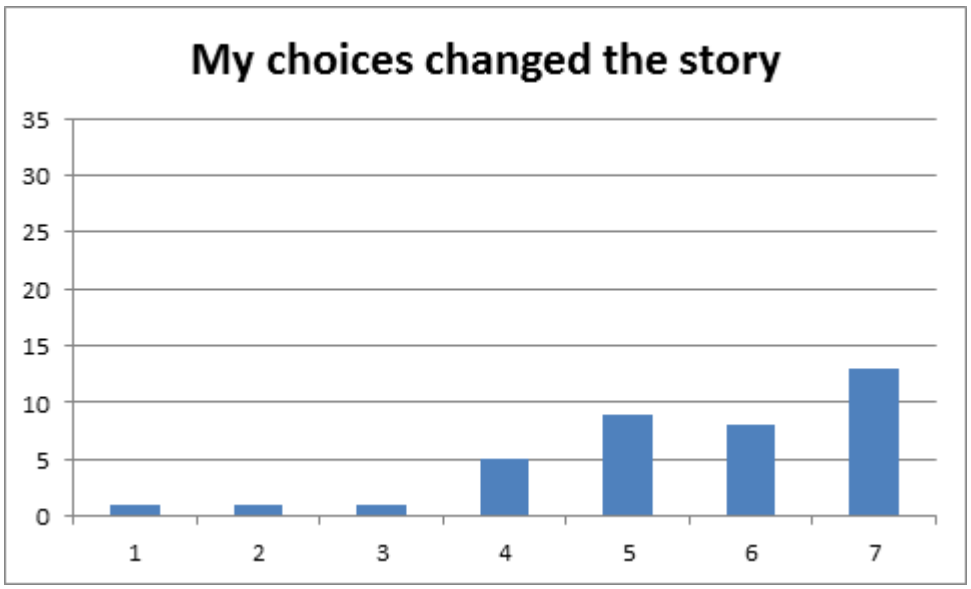


Figure 23 *Ghosts in the Garden* Chart showing degree of agreement with the question "My choices changed the story I experienced"

Did confidence that they were changing the story affect users' emotional engagement? A correlation coefficient of just 0.059 suggests not, and the sample size is too small to be really confident of what it might show. Given what I've uncovered about the story structures of the video games I've played, I am beginning to wonder if there's any value to this sort of interactivity. For me, *Skyrim*, with its wider story structure has been a lot less emotionally involving then either *Red Dead Redemption* or *Dear Esther*, both of which take the player towards one single, inevitable, ending. Consider also narrative paradox (Aylett, 2000), wherein the visitor's need for choice as a participant conflicts with their need, as a spectator, for satisfying story structure.

I wonder whether, rather than trying to construct a number of possible endings, the creators of Ghosts in the Garden might have better directed their creative energy, and the interactive nature of the device, to offer visitors a choice of points-of-view on one single story. If they had done so, would that have made the narrative stronger, and more emotionally compelling?

4.2 Knights Peril

Ghosts in the Garden was a limited term intervention in a museum, but I was also able to test the impact of a similar but more permanent digital narrative installation in another historic environment. Splash and Ripple, the company behind *Ghosts in the Garden*, also created *A Knight's Peril* for the National Trust's Bodiam Castle. A similar "choose your own adventure" style game, it used Near

Field Communications (NFC) chips rather than GPS to locate players within the castle. Each group was given an “echo horn”, shaped like a medieval hunting horn, and was instructed to seek out large wax seals that adorned the walls of the ruin in a number of locations. When they touched the point of the horn to the seal, they would hear an echo of the past.

Building on the data I collected from *Ghosts in the Garden*, I used the opportunity of a similar audio adventure game being installed at Bodiam to further explore whether I could understand how the game might change people’s responses to the “emotional impact question”, as well as test again the audience’s perception of their choices changing the story. This time I collected the data in person, conducting exit interviews on two days during half-terms week in October 2013, and recording the data on a tablet. The questions (Appendix B) were broadly similar to those I used for *Ghosts in the Garden*, but as a trial some questions were 100 point Likert scales presented by offering the respondent a sliding scale on a tablet.

I got 33 responses, although one or two people didn't answer some of the questions. On the first of two questions which used wording from the National Trust’s visitor survey ("Overall, how enjoyable was your visit to Bodiam Castle today?") the three responses selected were mostly "very enjoyable" with a very few "enjoyable" and a couple "acceptable." Which is gratifying for staff at Bodiam, because nobody selected "disappointing" or "not enjoyable", even though the second day was cold and rainy (there's very little protection from the weather at Bodiam).

Again, I used the standard questions to measure affect that the National Trust uses in its post visit surveys: "The visit had a real emotional impact on me." Visitors were asked to indicate the strength of their agreement (or disagreement) with the statement on a seven point Likert scale (Figure 24). All participants responded to this question, and the range of responses goes all the way from zero to six, with a median of 3 and mean of 3.33. There's a relatively small negative skew to responses (-0.11), and kurtosis (peakyness) is -0.41. All of which suggests a seductively "normal" curve. Splash and Ripple might have hoped for a more positive skew, given the presence of the game.

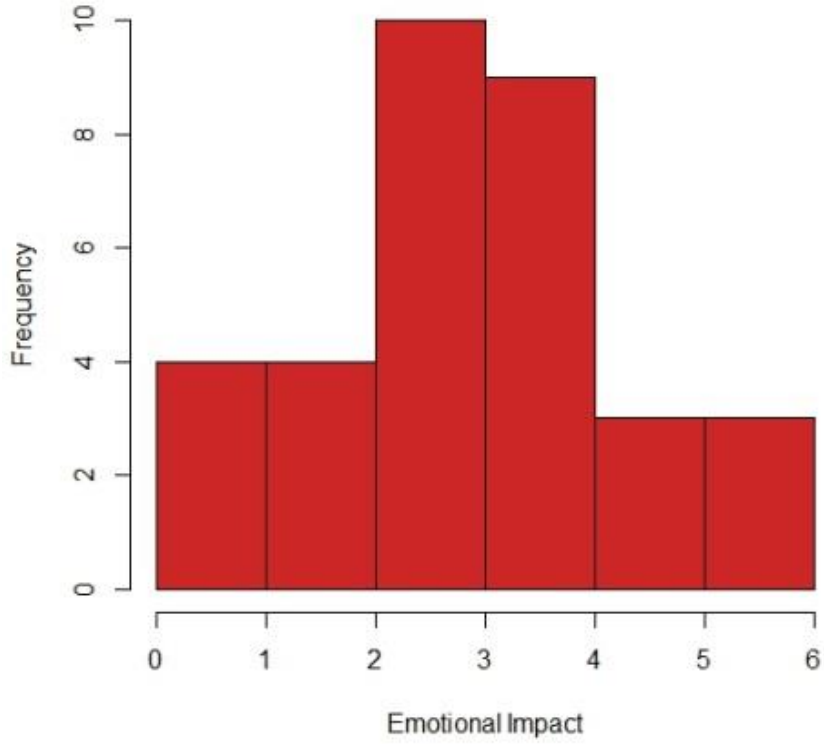


Figure 24 *Knight's Peril* Responses to "The visit had a real emotional impact on me"

The survey included several different questions aimed at learning:

- I didn't learn very much new today
- I learned about what Bodiam Castle was like in the past
- What I learned on the visit challenged what I thought I knew about medieval life
- If this were a test on the history of Bodiam, what do you think you might score, out of 100?

The first three use the same 7 point Likert scale, and the last is a variable from 1 to 100. Figure 25 represents the data from these questions.

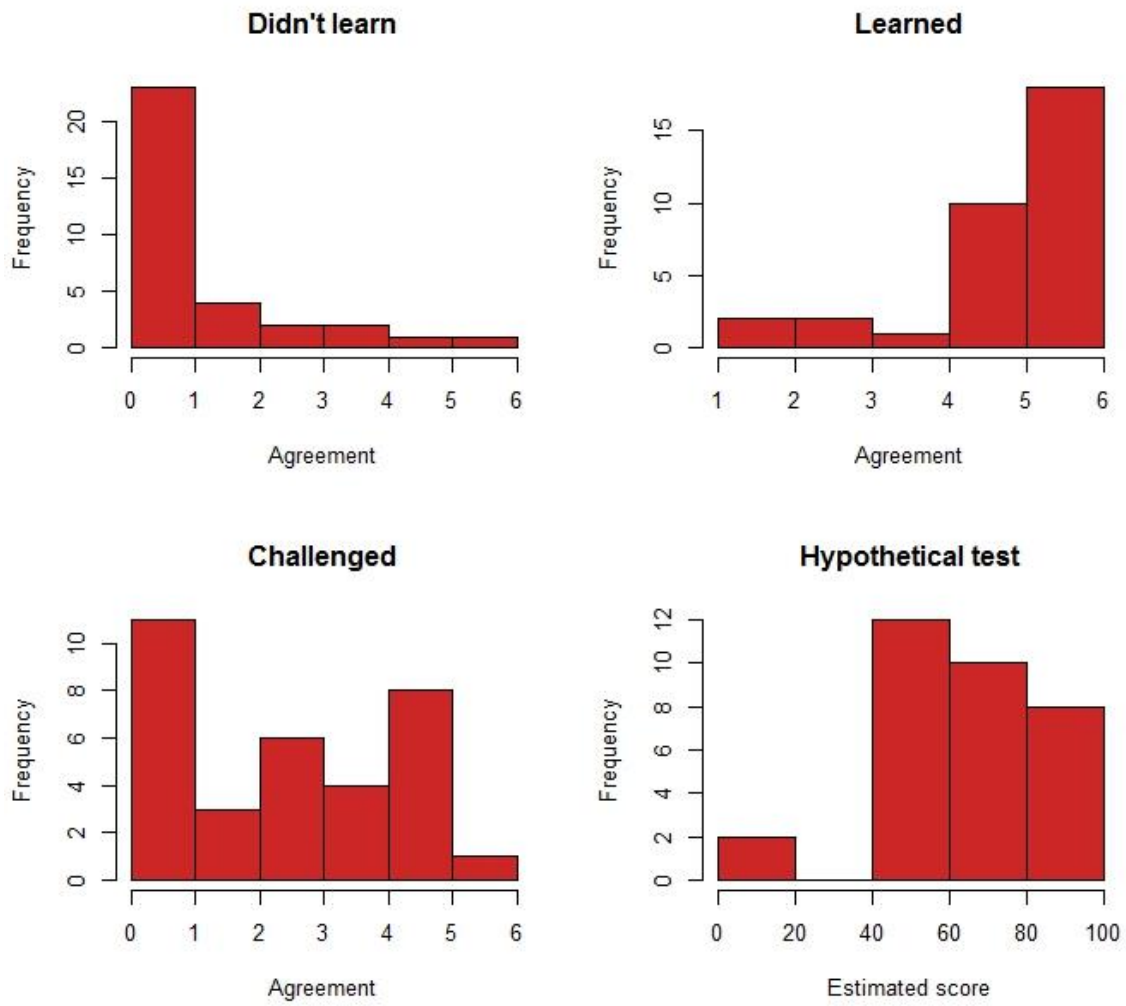


Figure 25 *Knight's Peril* Responses to four questions about learning

What do these tell us? Well, first of all it is a perfect demonstration of how Likert scale questions tend to "clumpiness" at one end or the other. The only vaguely "normal" one is the hypothetical test scores. What looks like a strong negative correlation between "Didn't Learn" and "Learned" turns out to be a rather miserly -0.33. This shows the weakness of both the small sample size and attempting to use categorical Likert scale questions.

Given the limited value of that correlation, I created a correlation matrix of all the seven point Likert scale questions, including the learning questions above, plus the following statements (inspired by the work of Othman (2012)):

- My sense of being in Bodiam Castle was stronger than my sense of being in the rest of the world
- Bodiam Castle is an impressive sight
- I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle
- The visit had a real emotional impact on me

- It was a great story
- During my visit I remained aware of tasks and chores I have back at home/work
- I enjoyed talking about Bodiam Castle with the others in my group
- Bodiam Castle is beautiful
- I wish I lived here when Bodiam Castle was at its prime, and
- I enjoyed chatting with the staff and volunteers here

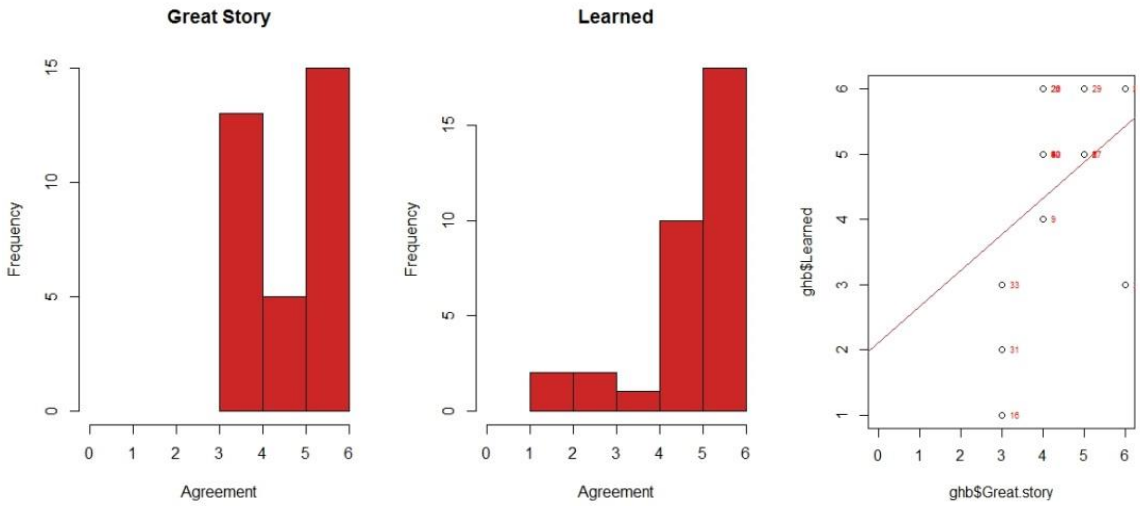


Figure 26 Correlation between "It was a great story" and "I learned about what Bodiam Castle was like in the past"

The strongest correlation that stands out (at 0.65) is between "It was a great story" and "I learned about what Bodiam Castle was like in the past." (see Figure 26) But correlation is not causation. Did respondents admit to learning because the story was great? Or was the story great because they learned about it? And of course neither distribution can be called "normal."

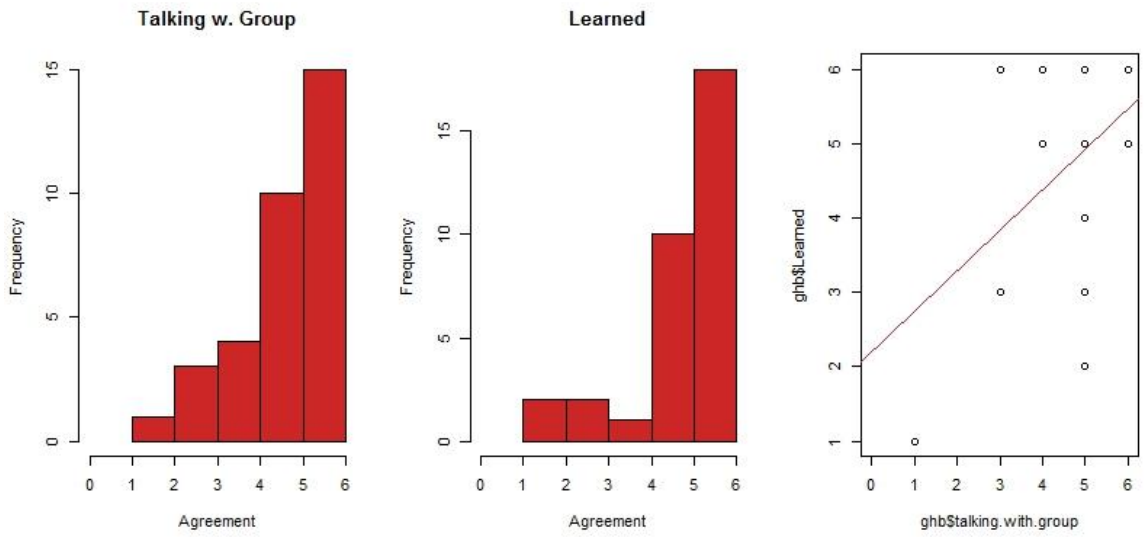


Figure 27 Correlation between "I enjoyed talking about Bodiam Castle with the others in my group" and "I learned about what Bodiam Castle was like in the past."

There's also an interesting strong correlation (0.57) between "I enjoyed talking about Bodiam Castle with the others in my group" and "I learned about what Bodiam Castle was like in the past." Similarly, there are correlations between the responses which agreed that Bodiam had a great story, and those who enjoyed chatting within their group as well as with staff, which might be expected.

"Bodiam Castle is an impressive sight" correlates strongly with "Bodiam Castle is beautiful"(0.54) but less strongly with "I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle" (only 0.37). Those last two correlate strongly (0.55) with each other, of course.

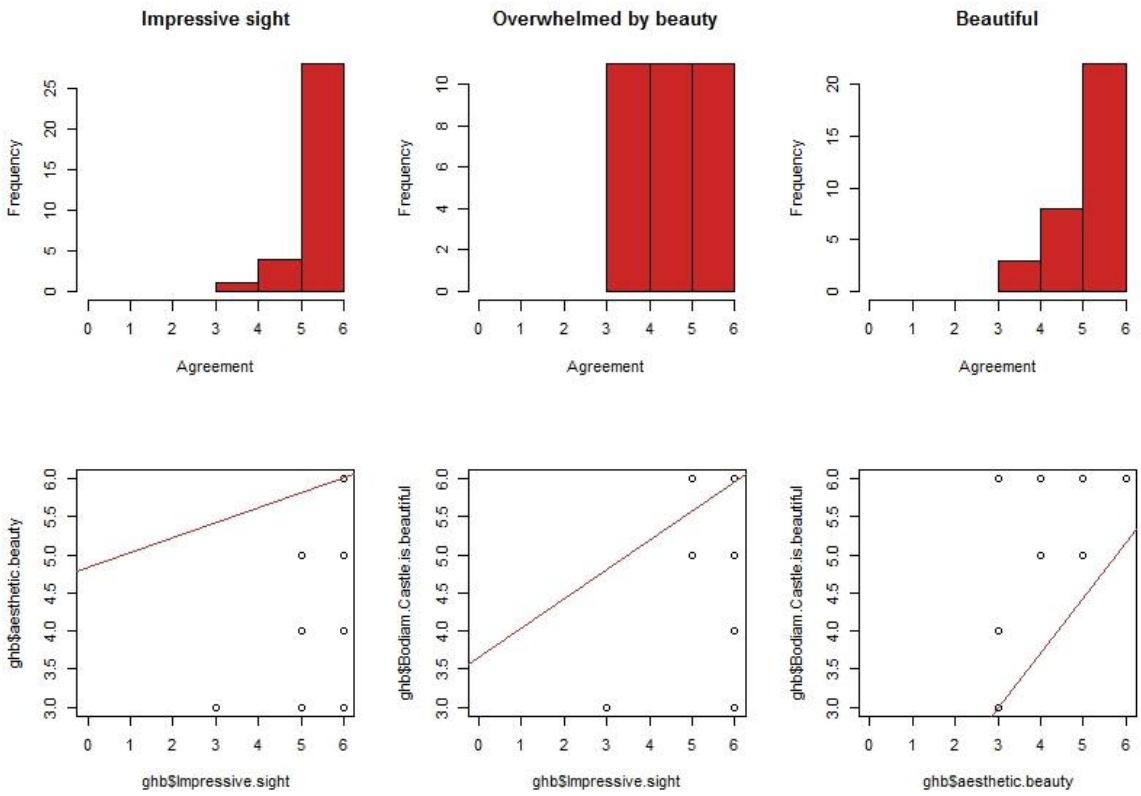


Figure 28 Correlations with emotional impact: "Bodiam Castle is an impressive sight," "Bodiam Castle is beautiful" and "I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle."

The strong correlation between "I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle" and "The visit had a real emotional impact on me" indicates the power of presence in engaging visitors' emotions. It even makes me wonder if most interpretation doesn't just get in the way of presence.

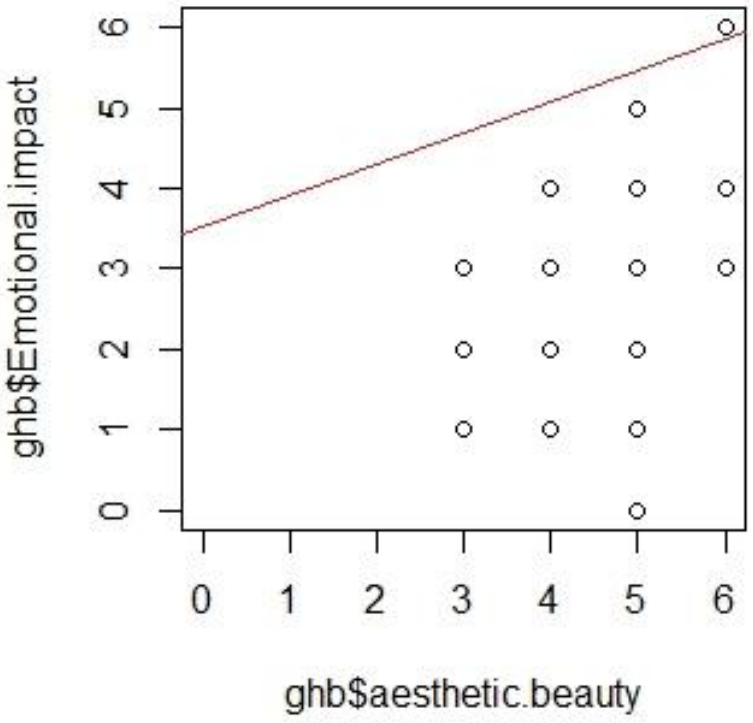


Figure 29 Correlation between "I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle" and "The visit had a real emotional impact on me."

4.3 The futility of applying ludic method to heritage

I expected, as I worked through the literature, that I would be applying ludic principles to cultural heritage interpretation on mobile devices. I imagined enabling visitors to construct their own interpretation of history, becoming their own researcher as they picked up facts re-presented from primary sources. Not simply a treasure hunt, or I-spy spotting trail: I imagined a technology that engaged visitor's emotions with play.

However, the literature is divided on the appeal of mobile devices, and there is some doubt that the medium is key to driving the adventure. And indeed, though mobile telephones were the heart of the "clock-punk" devices used in Ghosts in the Garden, the interface was at once both more intriguing and more basic. Basic in that it is "just" an audio tour – no multimedia bells and whistles--and more intriguing because it's a tactile box from "two hundred years ago", that feels both heavy and fragile and ticks and vibrates.

Does it matter that (most) users don't know that they are constructing the story through their choices? I don't know. When I started out on this research, I thought it was important. Now I'm less sure. Part of the success of *Ghosts in the Garden*, I think, has nothing to do with the boxes or the way the stories are scripted. Rather it comes down to good old-fashioned theatre.

A Museums at Night event at the end of May 2013, marked the moment when responsibility for day-to-day running of Ghosts in Garden passed from Splash and Ripple to museum staff and volunteers. I observed visitors' reaction to, first Splash and Ripple staff hand over the listening devices to visitors, and then Holburne museum volunteers doing the same job. As you might expect, the volunteers, on their first day on the job, were less experienced and less confident in what they had to say. When Splash and Ripple wove the magical story of the discovery of the devices during the museum's redevelopment, and the care that must be taken when tuning into the past, children listened with open-mouthed belief, and adults played along with good-natured engagement. The volunteers hedged their bets as they told the same story, adding the occasional "apparently" and "they say", and sharing their scepticism with the audience. My observation suggests they did not manage to engage the visitors in the way that Splash and Ripple had. Similarly, the visitor assistants at Bodiam Castle have a number of things to get across to visitors in a short transaction. Not only must they sell admission or check membership, they must promote membership and Gift Aid on entry to non-members and sell guidebooks. Properly introducing *Knight's Peril* to their visitors requires a resource of time that heritage non-profits are reluctant to prioritise. In the past few years, ludic heritage interpretation efforts have been restricted to occasional "museum late" events, or restricted to the family audience, and, for the most part, restricted to mobile phone apps.

But the majority of visitors do not want to use their mobile devices during their visit (Dilenschneider, 2017). And, given the comparatively poor adoption and perseverance of location based games like *Ingress* and even *Pokemon Go*, not even gamers are that interested in playing games in places (Tyler-Jones, 2014). The idea of enjoying heritage via presence - being in the place - trumps wanting to be more interactive. I asked a sample of 85 respondents were asked questions about using mobile technology at heritage sites (Tyler-Jones, 2018). It's not a large sample, but note the preferred methods for learning about a place - all the more active methods of interpretation are in the lower half of the rankings. The less technological methods, such as reading labels, panels or gallery fact-sheets, just looking at stuff, talking with the people who came with you or joining a led tour are preferred over the more potentially ludic methods: using multimedia,

talking to an interpreter, using mobile devices. Do our visitors even want to make decisions, if they deny the decisions they make change the story they hear?

As I headed into the practical phase of my research, I found myself more concerned with storytelling, rather than playing a game. Can the storytelling techniques of games create an emotionally engaging story that can be enjoyed in a more passive mode? One where the magic happens without the user realising that that it is their actions that make it unique?

4.4 A walk among the ruins

In my research, I posed the question "what can curators (and other heritage interpretation professionals) learn from games about structuring procedural stories for both meaning and emotional impact". My first experiment in creating an interactive, procedural heritage narrative out of natoms was purely virtual, it was not truly locatative. Though my larger research project concerns storytelling in three-dimensional spaces, I used this first experiment, in a virtual space, to explore pacing and the interaction of several stories around that space. We know that interactive stories suffer from "the Narrative Paradox" - that is, the more interactive they are, the less emotionally engaging the narrative becomes. This first experiment was a modest attempt to create an interactive narrative that also reaches an emotionally engaging climax.

An opportunity arose to create narrative set in that place that people could not visit at the time, but which I knew quite well. In April 2015, Clandon Park, a National Trust house near Guildford, suffered a catastrophic fire. A registered museum, it housed its own indigenous collection, two collections of ceramics and the Surrey Infantry Museum. Apart from a few hundred items that were salvaged during and shortly after the fire, the fate of most items was at that time, pending careful salvage operations, unknown. Coincidentally, I had my wedding celebration at Clandon Park 20 years earlier, and then a few years later, I found myself working for the National Trust, with the team at Clandon as well as other places across the region. I spent the night after the fire on-site, supervising rapidly arranged security. The seeds of the stories in this procedural narrative game were planted that cold night, as sparks crackled among the embers.

To prototype this interactive narrative I used the open-source text game engine Twine 1.4.2 (Klimas, 2009), which is an easy tool for creating text-based interactive stories. It also allows the use of photographs, includes conditional logic (scripting) within the application, and it can be further enhanced with Javascript. Indeed I used Javascript to add the required functionality to play sound.

I created four stories, featuring different aspects of the history of the house and collections, drawn from sources such as Chessum and Rowell (2002), Sadie and Grove (1980), and Gallop (1996) and primary records in the house: the story of one of the slaves sold with two plantations, supposedly to pay for the building of Clandon; the story of a soldier, treated at Clandon during the First World War; the

story of Edward Onslow, scion of the house who, after admitting his homosexuality went into self-imposed exile in France, and fathered the respected composer George Onslow and, the story of Hinemihi, the Maori meeting house in the gardens at Clandon.

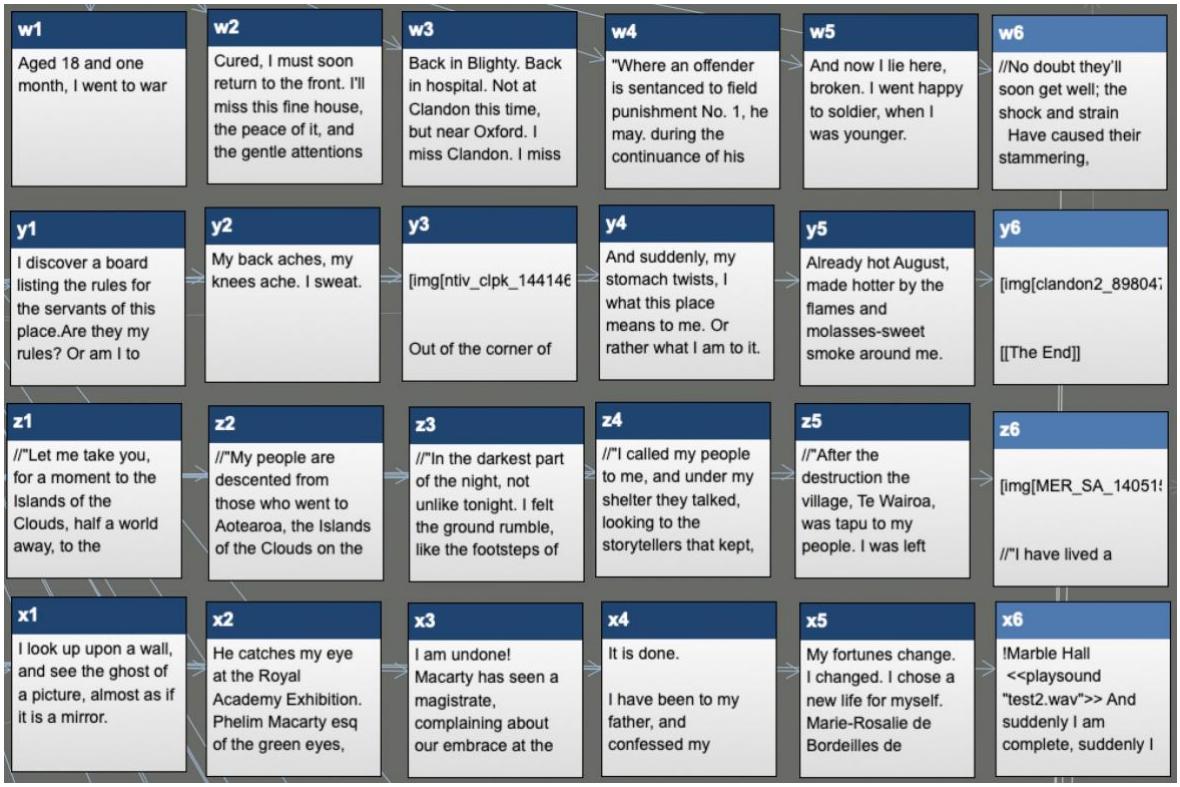


Figure 30 The six kernel natoms of each story as displayed in the Twine game engine: w is the soldier's story, x, Edward Onslow's. y is the slaves' and z, Hinemini's.

My intent was to interweave those stories with certain locations around the site, but to also react to the virtual visitor's interest in each story, and also use a degree of randomness, to create one of a possible 116,640 experiences (combinations of locative and story elements) that all build to a moment of climax and reflection that (I hoped) retains emotional power.

The four stories each consisted of six natoms, with a set sequence, making them kernals (see Figure 30). There are also a number of other natoms, including location descriptions (see Figure 31) photographs and music. As the user enters each of the virtual rooms, the engine would deliver a little descriptive text (dependent on this being the first visit to that room) and then randomly select one of the four stories and deliver the next kernel natom in that sequence.

An important part of this is the use of affective media, pictures and sound, not throughout the virtual visit, but placed strategically to amplify the impact of the

narrative. Most important of these were two versions of a recording of George Onslow's *Quintette a Cordes Op 78 1: I. Allegro patetico* (2005 Editions Andre Charlin) digitally manipulated by colleague Cat Cooper, an archaeologist specialising in auralisation (Cooper, 2014). Cooper modelled the marble hall of Clandon Park in two states – destroyed, open to the sky with no roof, and made whole again - and presented Onslow's piece as though played (first of all) in the destroyed room, and then (if the user returns to the hall having explored his father Edward Onslow's story) in the whole room, with all the echoes and resonances that make it a place that musicians had enjoyed playing in.

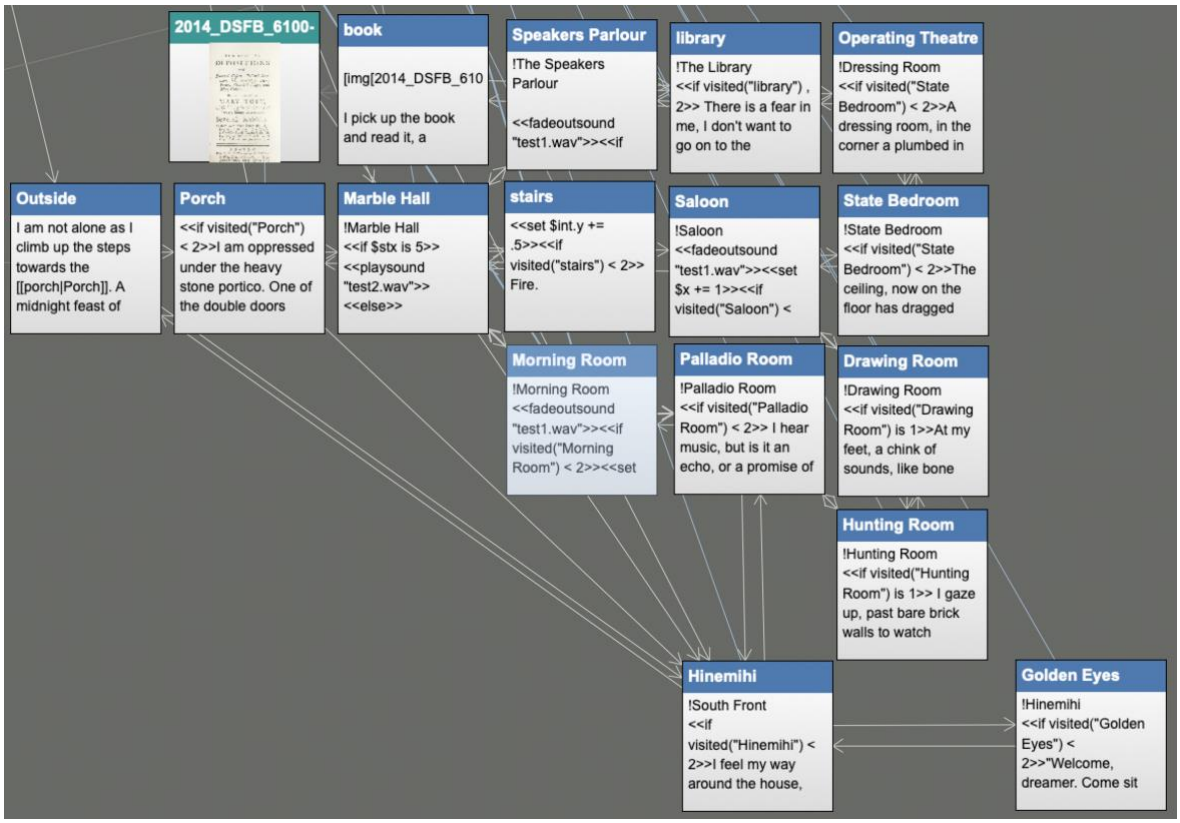


Figure 31 Location description natoms in Twine.

The creation of the prototype highlighted one issue that would require a whole other PhD to solve – measuring the relative interest in different natoms, to weight the future natom selection towards a story that satisfies the user. In this experiment I resorted to simply asking two binary questions after each natom.

Figure 32 A screen from the text adventure *A Walk Among the Ruins,* showing the "Does this Story interest you?" question.

If the user clicks on "Does this story interest you?" the selection of future natoms is slightly weighted towards the next in that narrative thread's sequence. If user clicks on "Are you not interested in this narrative?" then future natom selection is more strongly weighted *against* further natoms in that thread. If the user ignores both options, no weighting is applied. The weighting of threads is cumulative, so if the user expresses interest in the same thread twice, it is even more likely that a future natom will continue the thread. This was a somewhat clunky solution but it seemed to work, steering the random selection of stories towards a satisfying conclusion.

Cooper and I submitted the prototype to peer review, as an entry to *Heritage Jam* (www.heritagejam.org/home2), a competition organised by the University of York, and judged by academics and industry professionals. *A Walk Among the Ruins* was highly commended, with the following summary of the judges' comments:

> The breath-taking audio reconstructions included within this complex project captured our judges' imaginations and hearts, whilst the intricate layering of narrative and interpretive contexts left them wanting more. They were hugely complimentary of the way in which the duo had structured the piece to meaningfully showcase and integrate narrative, reconstruction and data into the piece. The interactive nature of the

> project promoted significant discussion on the topic of agency, control and interpretation in museums and collections, making it not only a thought provoking piece in its own right, but also in relation to wider heritage themes and issues. The technicality, scale and artful nature of the project, as well as the thoughtful, comprehensive para-data far exceeded the expectations of our judges for a short-term "jam" project, leading them to crown "Among the Ruins" as the highly commended team entry for the 2015 Heritage Jam. (Heritage Jam, 2015)

This showed that each participant could discover a variety of natoms with random selection, weighted by location and selected by location and (participant declared) interest, and yet experience kernels, still in an order which proved emotionally satisfying. It also demonstrated the affective impact of music in the narrative. In this case the climatic presentation of the Onslow piece, enhanced by Coopers acoustic modelling, was praised by every participant. It seemed from this tiny sample, that well-crafted audio, or music specifically, might trigger numinosity. It proved impossible to make it ambient, but the project offered personalisation and seemed to offer a potentially numinous experience. With this proof of concept, I was ready to try an experiment on bigger scale, with a real-world space and with real visitors making the decisions.

4.5 Chawton Untours

Following on from the limited success of *A Walk Among the Ruins*, I needed to try out some of the principles in a real-world rather than virtual environment. My initial intention was not to create a digital solution (not financially feasible within the limits of thesis research), but to "Wizard of Oz" the idea – to simulate a server selecting natoms, and the media delivering those natoms in a responsive environment, using human interlocutors "Unguides" equipped with mobile devices.

To do so, I needed a heritage site with pervasive Wi-Fi. The site had to be small enough to create a complete experience in limited time, but large enough to offer visitors a real choice of routes around the place. Ideally, I needed enough of a collection to create a good choice of natoms, but not so large that creating the database would be an onerous task for the time available.

Very few places, especially historic places, with thick walls, have anything like pervasive Wi-Fi. A number of National Trust places recently installed publicly accessible Wi-Fi in their café's but generally don't offer it in their historic spaces.

I also needed a place with a number of stories – not too many but enough to have a choice of stories in each space. Chawton House library, the manor house of the village of Chawton, with deep connections to Jane Austen, has many interesting stories. Stories that might not sit comfortably with each other. Do people want to know about the centuries as a residence for the Knight family, the connections with Jane Austen, and/or the modern day research into early female writers?

It was also a place that hadn't been open to the public long; 2017 was Chawton House's first full season welcoming days-out visitors and it was still finding an interpretive voice. The house is relatively free of "stuff" (an indigenous collection) and has modern display systems (vitrines and hanging rails), which meant that creating the experience would not be too disruptive. It has pervasive Wi-Fi (the library's founding patron, Sandy Lerner, co-founded Cisco systems) which made the experiment a lot easier and cheaper to run.

Chawton had also already been the location for an experiment in interactive storytelling. Back then, in 2005, the Chawton House Library was not widely open to the public but was primarily a centre for the study of Women's Literature. One could argue, however, that the visiting academics were also heritage visitors of a sort, and the house and gardens also welcomed some pre-booked visiting groups, such as the Jane Austen Society of America, and local garden societies. In their conference paper (Halloran, Hornecker, Fitzpatrick, Millard, & Weal, 2005), a team from the universities of Southampton and Sussex describe how, looking for "curators" to work with, they co-opted the trust's Director, Estate Manager, Public Relations Officer, Librarian and Gardener. All these people may have taken on the role not just of curator, but also guide to those visiting academics and groups. This paper describes how their tours interpret the place:

> Visitors' experience of the house and its grounds is actively created in personalized tours by curators […] House and grounds are interconnected in a variety of ways, e.g. by members of the family rebuilding the house and gardens or being buried in the churchyard. Thus artefacts or areas cannot be considered in isolation. There are many stories to be told and different perspectives from which they can be told, and these stories often overlap with others. Thus information exists in several layers. In addition, pieces of information, for example about a particular location like the 'walled garden', can be hard to interpret in isolation from information about other parts of the estate – there is a complex web of linked information. […] Curators 'live the house' both in the sense that it is their life but also that they want to make it come alive for visitors. The

> experiences offered by Chawton House are intrinsically interpersonal – they are the result of curators interacting with visitors. Giving tours is a skilled, dynamic, situated and responsive activity: no two tours are the same, and depend on what the audience is interested in. They are forms of improvisation constructed in the moment and triggered in various ways by locations, artefacts and questions. (Halloran et al., 2005, p. 2)

Tours are a brilliant way of organising all those layers of information, and I'm sure a personal tour from any one of the "curators" that they identified would have been excellent. But the problem comes as soon as you try to scale, or mass produce the effect. People, even volunteers, are an expensive resource, and so only the smallest places can afford to give every visitor a guided tour experience (Io, 2013; Malcolm-Davies, 2004; Poria, Reichel, & Biran, 2006; Reisinger & Steiner, 2006). Even then, individuals or families have to book on to a tour, joining other people whom they don't know, and whose interests they don't necessarily share. The guided tour experience gets diluted, less personal, less tailored to your interests. Which is when you start getting people saying they would prefer to experience the site by themselves, rather than join a tour. Of course, some tour guides are better at coping with these issues than others, but visitors are wary of taking the risk with a guide they don't know, even if they can recount experiences of brilliant guided tours.

The project written about in the paper had two sides: one was to try and produce content for schools, but the other was of particular relevance to this project.

> The curators are interested in being able to offer new kinds of experience to their visitors. We aim to find out what types they would like to offer, and help to create them. There is thus a need for 'extensible infrastructure' based on a basic persistent infrastructure that supports the creation and delivery of a variety of content.
> (Halloran et al., 2005, p. 2)

And four questions they ask themselves are also of particular interest:

- How can we enable curators to create a variety of new experiences that attract and engage different kinds of visitors, both individuals and groups?
- How do we engage curators in co-design of these experiences?
- How can curators without computer science backgrounds contribute to the authoring of content for the system?

- How do we create an extensible and persistent infrastructure; one that can be extended in terms of devices, content and types of experience? (Halloran et al., 2005, p. 4)

At the time of writing the paper, they had conducted a workshop with their chosen curators, using a map with 3D printed features. Although "use of a map in the first instance may have triggered somewhat different content," they discovered that "Eliciting content from curators is most naturally and effortlessly done in-situ."

I particularly liked the observation that "Listening to them is much more lively and interesting than listening to professionally spoken, but often somehow sterile and dull audio tapes sometimes found in museums and galleries." So enthusiastically did the team connect with the curators' presentation, that they decided to record the tours and edit them into the narrative atoms that were delivered by their infrastructure (in those days, GPS based running on "Palm Pilot" style hardware).

More importantly, the most pertinent conclusion was that the curators were best placed, not just to select the narrative atoms from the recorded materials but also "sort them into themes and topics, so that the system can cater for people with different broad interests, for example: landscape, flora and fauna, or how Jane Austen's writing reflects the environment. This necessitates a learning process, which must build on existing practices and over time develops new practices based on experience and reflection."

Taking that learning on, my first task was to talk with current volunteer guides and staff of the Chawton House Library and to record their tours. But I was also helped by having access to the draft of a new guidebook which was being created for general visitors, in a separate project that coincided with my information gathering phase.

4.5.1 Creating the narrative atoms

For this project, I employed the concept of natoms devised by Hargood (Hargood et al., 2008) but in adapting the principle to a physical location, I distinguished between two types: Persistent natoms (or P-natoms) which are physical and thus, for the a heritage visitor, stay in one place and do not change, and Ephemeral natoms (or E-natoms) which are not tied to a particular place or even form, they are any media which can be digitally transmitted and shared, such as text, video or music.

The tool I used to create the database of Natoms is Scalar. I chose this because it meets the following criteria:

- Collaborative – more than one author
- Handles all sorts of media types
- Includes tags
- Allows the author(s) to see and manipulate the links between "Natoms" in networks
- Ability to turn some tags into narrative order (to create my "kernels")
- Works with ontologies (e.g. OWL)
- Complies with data standards (e.g. RDF)

I had considered Twine, which worked well for my first experiment, can work across a network, and enables control of kernel order. But it is not built for collaboration and doesn't handle different media easily. Handling music for example is possible, but requires coding beyond the basic functionality and I wanted to keep the cost of implementation (including time costs) to a minimum.

I explored other software that academics use to build their data networks, but decided the learning curve was too steep. On the other hand Scalar seemed like a simple package, with a visual interface that can be used intuitively, without having to learn any coding language. It's built to make interactive e-book multimedia dissertations really, but could be applied to the job I needed. It uses standards like OWL and RDF, future-proofing the database if it proved a success. It has features I knew I would use, like tags and narrative paths, and does some very pretty network visualisations. It is designed to help multiple authors collaborate on the same project and handles lots of media types.

It does have the disadvantage of not being able to make links conditional, which Twine handles very well. It also requires a web connection, it cannot create a standalone local file. I had hoped that the pervasive Wi-Fi at Chawton would mitigate that problem, though a standalone file would have been very useful. In actuality the wi-fi did not prove as reliable as it had been in early tests. I could not, in conscience hand over the role of *Unguide* to my volunteers as intended. I feared that if they were left in the lurch by the now, slow and patchy wi-fi, they would deviate from the pseudo-algorithmic script, or even worse, give up on the tour entirely. So, I dropped the Wizard of Oz concept and came out from behind the curtain to become the Unguide, and instead getting to the volunteer to observe each tour and record video that I could watch after the event.

To build my network of natoms I started with a scaffold of P-natoms. These are the rooms that our visitors will be exploring. It was very easy to list the rooms, and soon I had that list of rooms, each tagged as a P-natom, looking like Figure 33 in Scalar's useful "connections" visualisation.

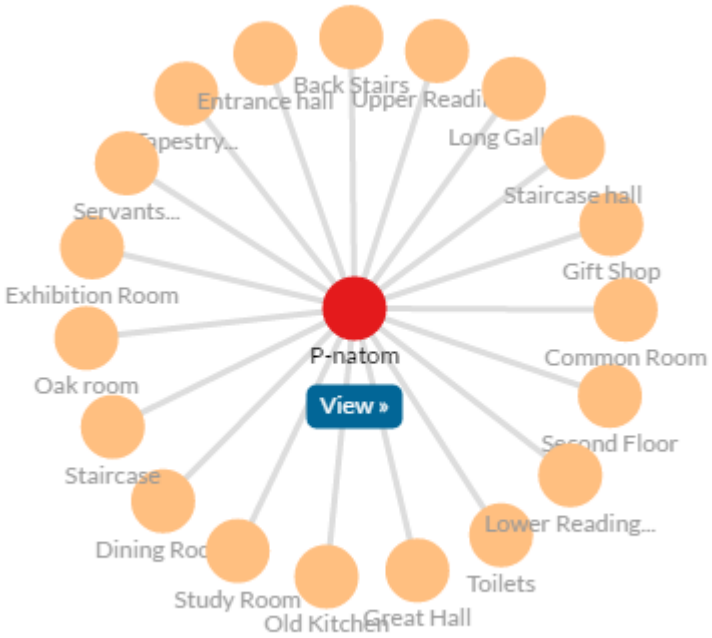


Figure 33 Listing the physical narrative atoms in Scalar

One issue requiring consideration was how best to illustrate the links between spaces, or as Bill Hillier (1996) puts it, the "permeability". Scalar allows simple hyperlinks, but doesn't visualize them, or make them reciprocal. It also has a Path function, but that is only one way, intended really for stringing natoms together into a long-form text. "I therefore chose the program's tagging function, which is quite sophisticated in distinguishing between items "being tagged" and "tagging". Once I'd tagged the transitions between the listed spaces, my visualization looked like Figure 34.

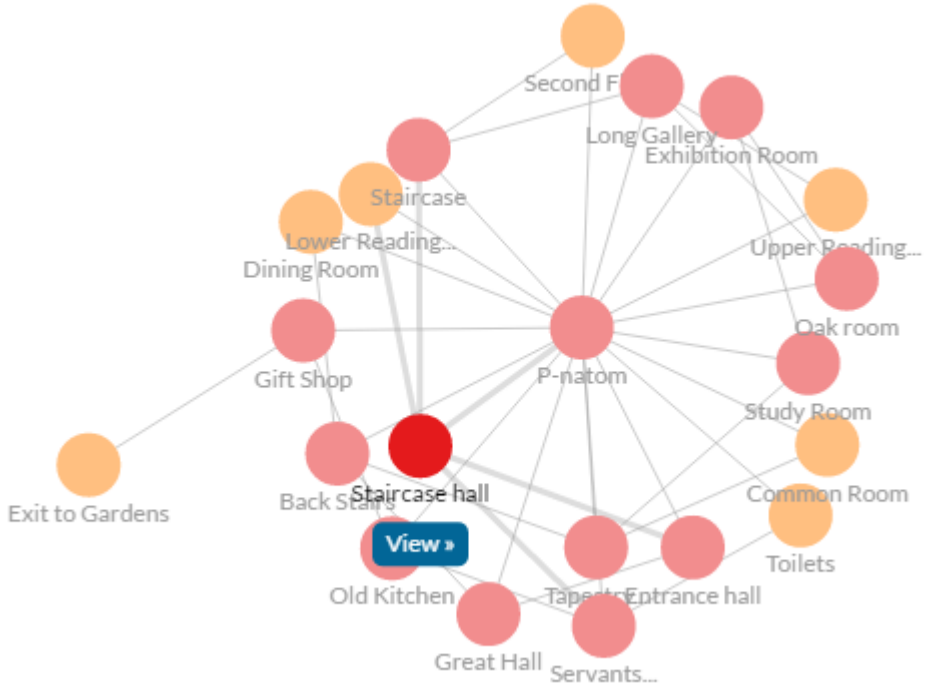


Figure 34 Connecting the spaces (as p-natoms) in Scalar

Although the gardens are included in this network as a gesture toward future-proofing the model, I planned to keep my experiment within the walls of the manor house itself. These spaces are by no means all the P-natoms. More of the collection would go in later. First I wanted to try adding some E-natoms. And that meant starting by breaking down the guidebook text. The first part of the guidebook was an essay, a brief chronological history of the place. Broken down into its constituent parts, and tagged as E-natoms, Figure 35 shows what that essay looked like.

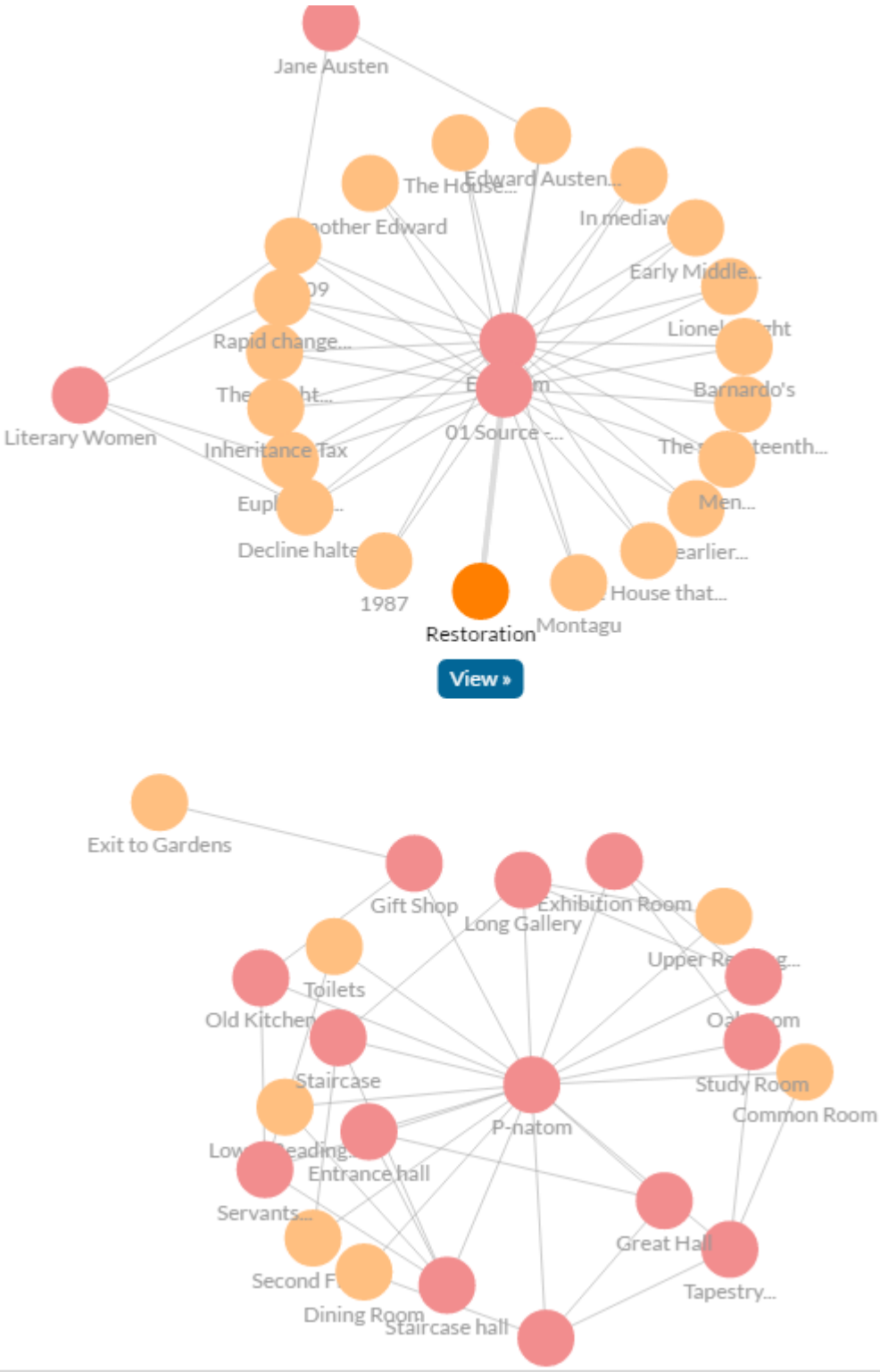


Figure 35 Creating the first ephemeral natoms, not yet connected to the physical spaces

At this stage there is no connection between the new E-natoms and the P-natoms, or between the story and the place. However, already some (but at this stage surprisingly few) of the e-natoms were suggesting engaging stories: which I've tagged "Literary Women" and "Jane Austen". Over the course of creation these would blossom into two of three *syuzhet* narratives that would emerge from the

great network of natoms. Each focussed on a different aspect of the house's history: its famous family connections with Austen who lived in the same village and was a frequent visitor; Knight family scion, Montague who tried his best to preserve its faded glory, and a peek into the collection of women's literature that it now houses. The e-natoms of each story became the kernels, the *syuzhet*, that must be experienced a scripted order (everything else becomes *fabula* or satellites). To that end, while they *could* be discovered in appropriate spaces, where p-natoms might be excellent illustrations of the narrative, they must be capable of being disconnected from that location. Unlike games, I did not want to force a visitor to revisit a location to get the next kernel is the sequence. So once a visitor showed particular interest in one of the three narratives, the remaining kernels in that narrative would be selected based on time and not location. (For more on this see table 3 in the next section.)

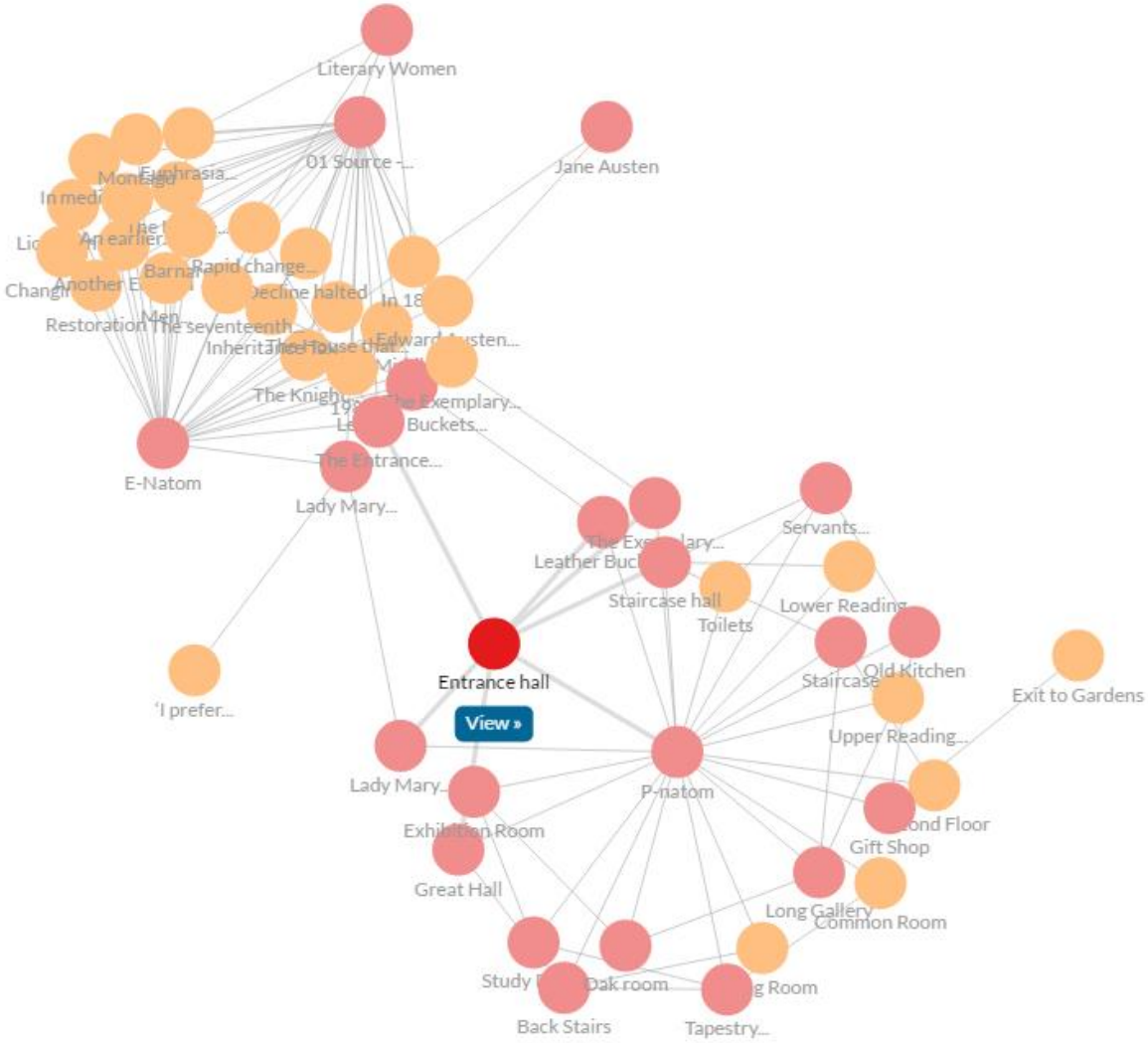


Figure 36 Beginning to link persistent and ephemeral natoms

Once parts of the collection, in the spaces in which they are displayed, and their associated stories were added, two P and E-natom “solar systems” start to join together (Figure 37). This is after the collection in just one space, the entrance hall, has been broken into the natoms. It gets a lot more complex as work progresses. I especially sought natoms with a certain emotional resonance, that might become some of the emotional triggers that really hook people into the place’s story. The first notable natoms which might have that effect were: a message to the future from Montague Knight, the nursery rhyme *“Lucy Lockett lost her pocket”*, and the tragic death of Eleanor Verney. However, as I built the network, I began to realise that there was no functional value to tagging each natom as Ephemeral or Physical. Although the distinction would be valid in an algorithmic version of the network, for human interaction with a visual map of the network, it is less useful, and indeed possibly confusing.

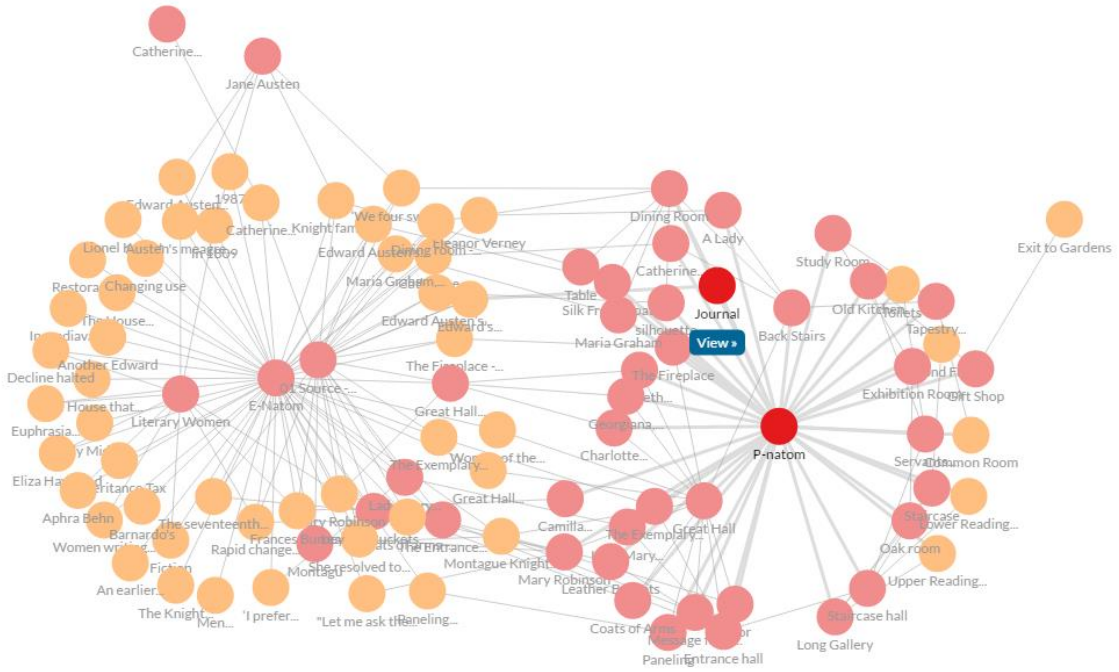


Figure 37 Ephemeral and persistent natoms start to mingle in the work, as connections are made between them

Some of the e-natoms are intended create a layer of responsive sound – soundscape options in some spaces that were tailored to the visitors’ interests or the narrative they were following as they entered the room. My original intention was to produce multi-layered sound loops, creating soundscapes that varied depending upon the visitors in each space. However, the eventual limitations of the budget and the web-based database I was using meant that I could only deliver one channel of sound to each of the Wi-Fi speakers. Working with university colleague Ed Holland, we created nine simple soundscapes, including:

- A reading of a letter to the future that Montague Knight hid under a new floor, with the sound of carpentry in the background
- A country dance, *The First of April*, with crowd chatter as if in an event
- A recital of the nursery rhyme *Lucy Locket Lost her Pocket*
- Music including Schubert's 'Tragic' Symphony no.4; *Groves of Sweet Myrtle*; Aria da Capo, from Bach's *Goldberg Variations*; *La Grecque* a Cotillon; and an excerpt from Elgar's 2nd Symphony

These aural e-natoms were chosen to feature both uplifting (for example, Elgar's 2nd Symphony) and downbeat (Schubert's 'Tragic' Symphony no.4) pieces. In that database, all the e-natoms, where possible, were labelled with up, down or neutral beat indicators (Laws, 2010), to enable the Unguide to consider and vary the emotional rhythm of the story within the choices made by the visitors. It is notable how few of the e-natoms actually had any up, or downbeat value. The vast majority were neutral.

While it had been useful to keep the distinction between p-natoms and e-natoms in mind while beginning the database, that distinction became less useful as the network grew, and some ephemeral natoms were linked to physical ones. Representing the database as two separate orbits of ephemeral natoms and physical ones became counter intuitive. It was difficult to distinguish the links between the two clusters. Upon completion, the distinction between physical and ephemeral natoms was dropped to the let the narrative network find its shape (see Figure 38). In this view you will note a number of natoms around the edge that are not linked to those at the core. These will not feature in the Untours, but could be linked in future versions if more areas of the site (for example, the kitchen and the gardens) were included or new *syuzhet* narratives were added.

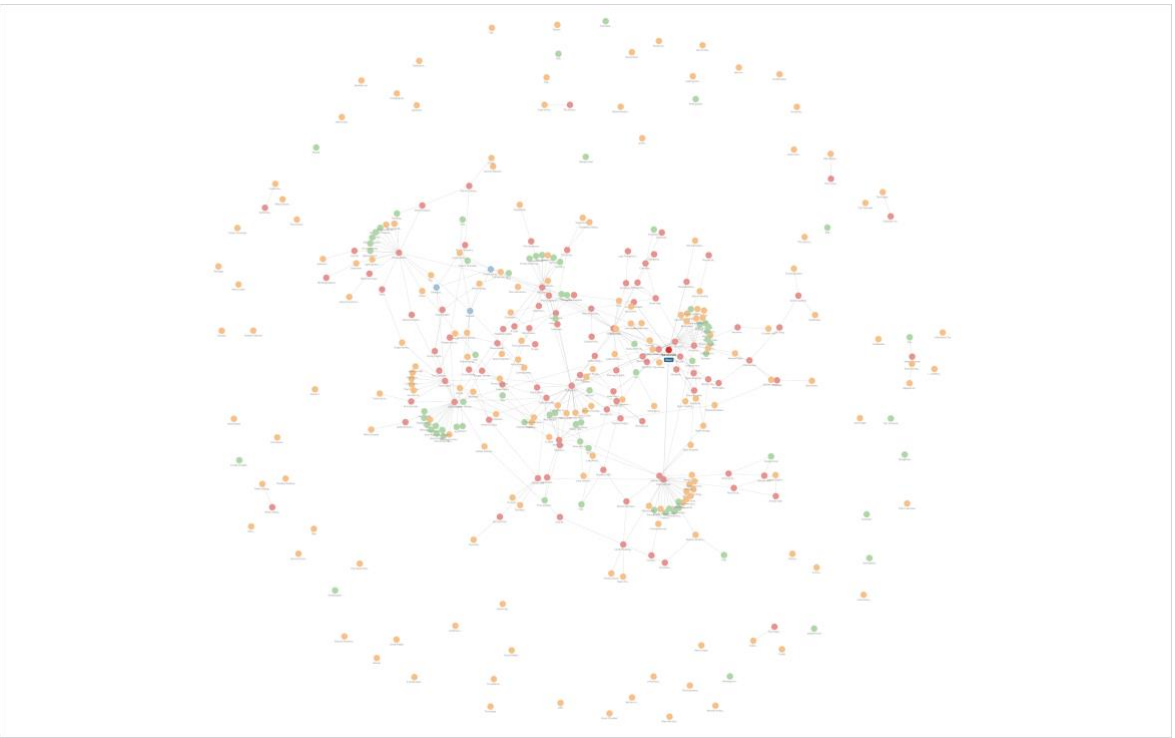


Figure 38 The final narrative network as represented in Scalar

The colours of each node are defined by Scalar: blue- paths; orange – pages; red – tags; green – media files. Since content can have more than one type, a given item may change colours depending on context.

4.5.2 Delivering the natoms

The Untours worked as follows. The Unguide (me) would greet visitors as they entered the house and ask if they wanted to participate. All but one group agreed. Most were visiting in small groups of two or more, a few were visiting alone. They were given a short text description of the experiment and ask to sign a consent form. The tour then began in the entrance hall, with a short introduction:

> Welcome to The Chawton Manor Untour. I'm your Unguide for the next 45 minutes. As an Unguide, I don't tell you where to go next, or what to look at. Instead, you lead the way choose what to look at, and I'll tell you something about it.

And then the first kernel, which starts all the narratives:

> Imagine walking into this house twenty years ago, when it was in a state of disrepair. The ivy breaking in through the windows, the previous residents having retreated room by room, as leaks, damp and cold drafts

advanced, until they were living in just two rooms, with a kitchenette in the corridor."

After which the visitors were offered their first choices, to ask about any of the objects in that space and to choose between moving on to the Staircase Hall or the Great Hall. All of this is scripted, delivered to the guide by Scalar on an iPad that the guide carries.

Importantly that script, while written in natural English, mimicked basic Event Condition Action (ECA) rules (Ardito et al., 2018) instructing the guide what to do in response to the visitor' behaviours. For example, the instructions in the Great Hall are:

1. If this is the first time your group have entered the great hall, play MUSIC on Great Hall speaker
2. Watch your group, what are they interested in? If they look interested in one of the tagged items, click on that link below.
    - Cabinet Info (GH)
    - Charlotte Gunning
    - Coats of arms - history
    - Diana, Wife of Sir Walter Scott
    - Elizabeth Hartley
    - The Family Cookbook
    - The Fireplace - history
    - Floor
    - Georgiana, Duchess of Devonshire
    - 'A Lady'
    - Log Store
    - Mary Robinson
    - Message from Montague Knight
    - Old Stairs
    - Paneling
    - Women of the long eighteenth century
3. If they don't seem to demonstrate an interest in any item: Read GREAT HALL HISTORY and return here.
4. If no kernel 2 has been read in this room, turn lamp on (highlighting Montagu letter), and play KERNEL 2C
5. Offer the visitors the option of going towards the old stairs, or back into the entrance hall.

Each link mentioned takes the operator to a page with further instructions and a script to read. Instructions about turning on lights referred to remote controlled switches that could be operated by the guide's iPad. Other rooms were equipped with speakers and the instructions would explain in what circumstances to play which sounds/music. After two practice runs I completed seven runs with video records for later analysis of the choices made and their impact on the emerging story.

As a heritage professional rather than a software engineer, my programming skills are limited. I had managed to create a workable "choose you own adventure game in Twine for my Clandon project, but the complexities of creating such a program for Chawton were beyond my abilities. The process however seems quite clear in my mind, and have mapped it out in in Figures 39 and 40

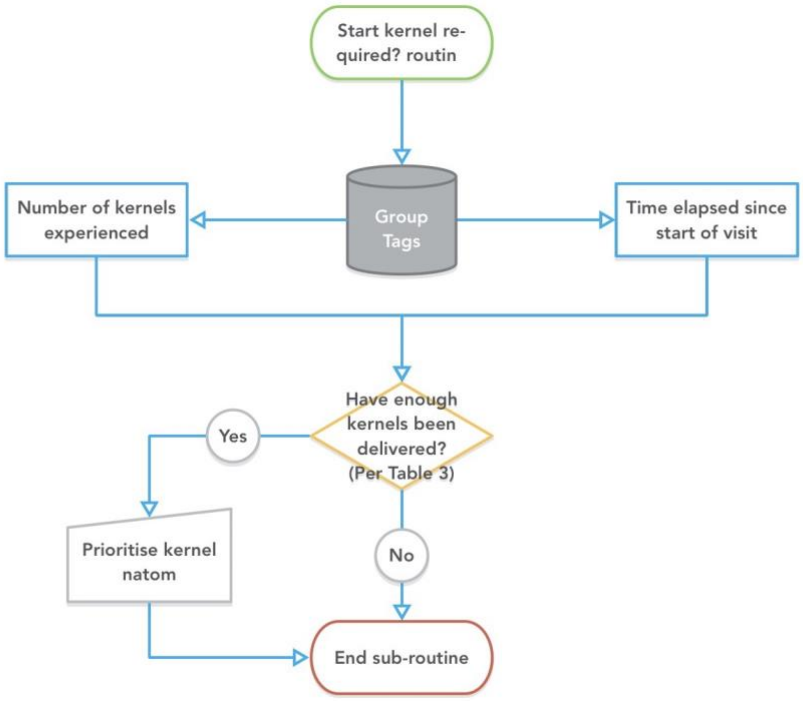


Figure 39 A flow chart of the pseudo-algorithmic subroutine for deciding if a kernel natom is required, frequently called by the main progam represented in Figure 40

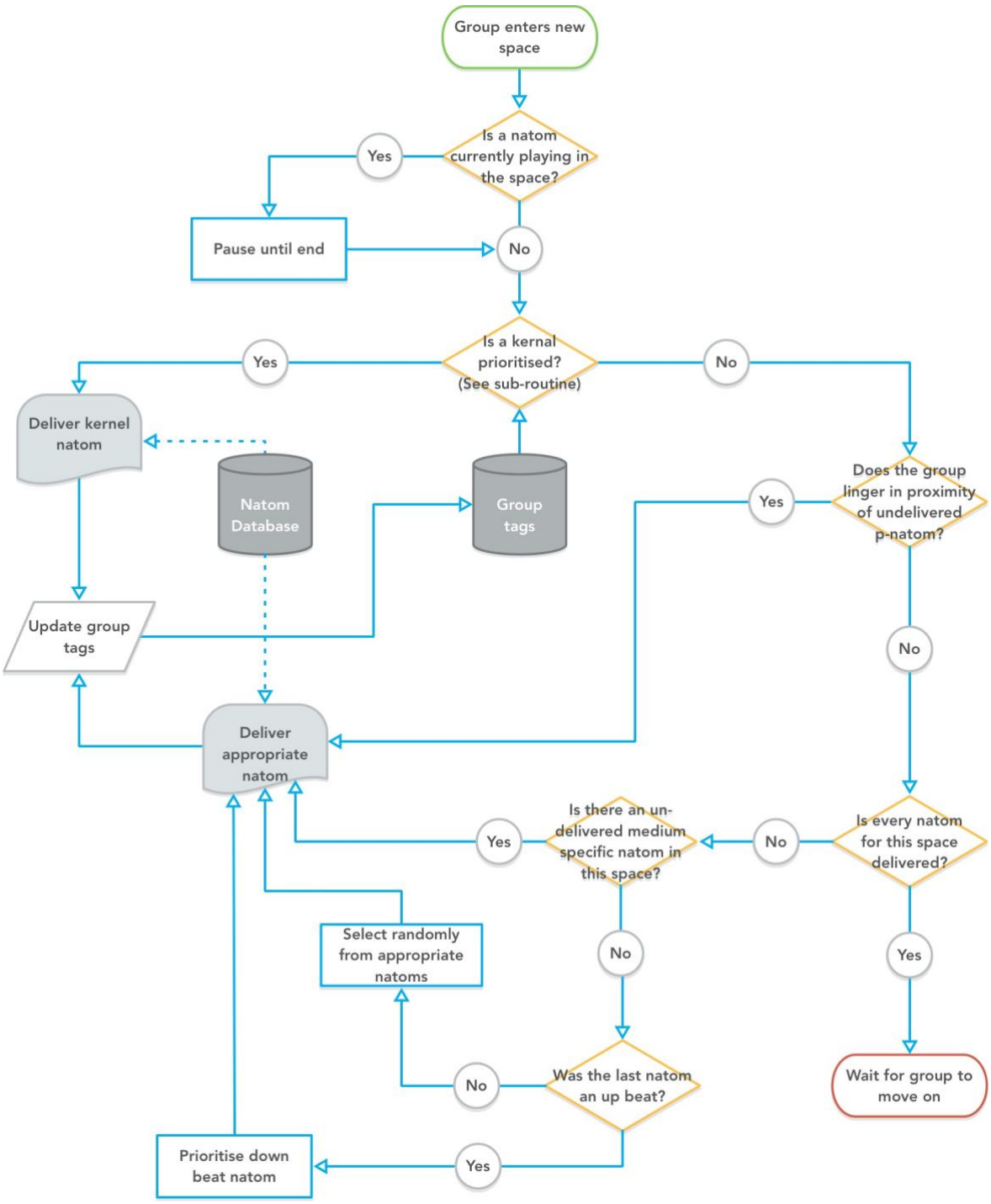


Figure 40 A flow chart of the pseudo-algorithmic process my Scalar instructions were written to emulate.

All of which is designed to simulate a visitor-led approach to storytelling, where natoms were selected according to what objects aspects the visitor appeared interested in. Most of the collection on display was presented without interpretive labels (Figure 41), ensuring that only the Unguide (with the database) was responsible for storytelling. Instructions about lighting specific objects (Figure 42), or triggering specific sounds when a visitor entered a room were an attempt to subtly influence the visitors' interest.

4.5.3 Reviewing the experience

To review the stories that were formed when the visitors' choices and interests, and attempts to direct attention, contributed to the selection of the next natom of the story, I recruited participants from the usual visitors to Chawton. The house is not a busy site, so for each tour the first visitors entering the house were asked and (except in one case) accepted the offer of an Untour. The sample was therefore reasonably random. If they accepted (and only one party refused) they were given a summary of the ethical policy of the research and an explanation of how to withdraw their data if, on later consideration they wished to do so. I completed a small number of practise tours and then seven tours were video recorded by three volunteers from Chawton. I gave each participant a short questionnaire to complete after their experience.

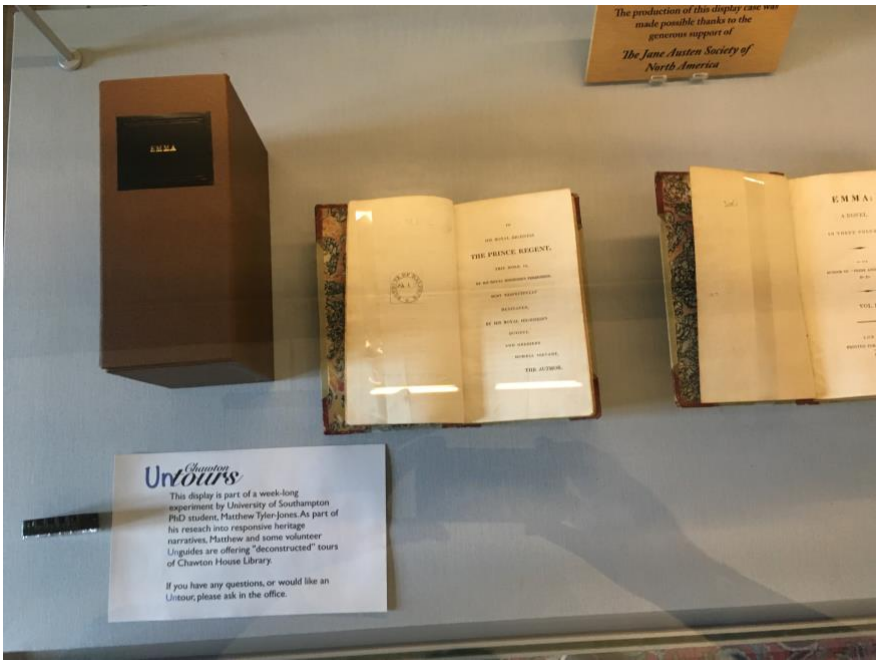


Figure 41 An exhibit with a label explaining the experiment

Initial observations showed that the least successful part of the experiment was the effort to direct visitors' attention with lighting or sound. There is no video evidence that the visitors' attention was influenced by any of the interventions. There were failings in the experiment in this regard: the lighting changes were not dramatic enough. I did not have total control over the whole environment and therefore not enough control over what attracted the visitor's gaze.

Figure 42 Additional remotely activated lights did little to attract visitors' attention.

In Chapter 3 I listed what I thought might be three qualities of a good responsive environment: that it be personalised, ambient, and numinous. Unlike the Clandon prototype, there was no evidence that the visitors had a numinous experience. But there is evidence to discuss concerning the personalised and ambient nature of these experimental Untours.

4.5.4 Personalised

The experience should be tailored - specific to the interests of, if not the individual, then those shared by the visiting group. Analysing the choices made by the participants, it is easy to recognise that each had a personalised tour. Each one started in the same place, with the same kernel (those natoms that must be presented in order – see page 85) but explored in different directions, encountering a variety of natoms in a variety of sequences. For example, the first tour analysed included kernels from all three arcs, but completed the *Entertaining Jane* arc. Kernel natoms from *Women Writer…s* and *Montague Knight,* when they were experienced, therefore became satellites to the *Entertaining Jane* story. The second Untour group by contrast, made choices that concentrated the narrative on *Montague Knight,* with some satellites from *Women Writers* and just two from *Entertaining Jane.* Each of the tours was similarly varied, following the visitor's curiosity rather than a prescribed route and even breaking taboos of the heritage visit, going through doors that were not normally open to the public, "Counter-Tourism" as it were (Smith, 2012).

I again asked them how much they felt that their choices had changed the story they heard, to determine whether they had a perception that they story had been personalised. The overall sample size is tiny, not statistically relevant, but the most interesting evidence was anecdotal. After one tour I happened to be taking my lunch break in the café, when the participants of the previous tour took a table next to mine to fill out their form over lunch. They discussed that statement "I felt choices I made changed the story I heard" and concluded no, their choices had not changed the story because the facts of the story had not changed. That was history, and history was immutable.

The first lesson I might take away is that I should have worded the question better - these two respondents defined the story as the history they heard - the fabula - and were not particularly aware that the narrative arc - the *syuzhet* - they experienced was selected by their own choices. But there is another way to read this: it is further evidence they found the story arc satisfying. I had also asked every responding group how much they agreed with the statement "It was a great story" and they all answered positively. But the idea that they felt their choices had not negatively impacted the story suggests they had not experienced narrative paradox. The principles of scripting a set number of kernels to each arch seems sound. Six seemed to be an ideal number, if we assume that the visitors will spend around 45 minutes in the house (Lithgow, Lloyd, & Tyler-Jones, 2012). However, two of my six kernels were the same for each arc. The same

introductory kernel started off each tour and at the end, the sixth kernel, briefly describing how the house was saved for posterity capped-off each arc. Which meant that, in reality, there were only four kernels specific to each arc. The sixth kernel was a call back to the first, introductory kernel, which I hoped would make a satisfying ending to the story as a whole. However it left only four kernels with which to create the sort of emotional curve that Vogler and Sylvester describe (chapter 3.5). I would relegate that final kernel into a satellite natom, and give each arc a fifth kernel.

Once a visitor showed a preference for, or embarked upon one of the specific kernel sequences, I tended to preference those kernel natoms over other options but not to the exclusion of other arc kernels, which in effect made the kernel natoms of another arc, satellites to the arc that was being followed.

This is how an algorithm should deal with the choices. The first time two kernel natoms are available, each from competing stories, the algorithm might randomise the decision with a 50/50 probability. But the second time, the arc that was chosen, the first time would be weighted, for example, the probability might be 60/40. In fact the weighting will be a function of time elapsed and the number of arc kernels remaining. Based on a tour taking 45 minutes the probability of a kernel natom from the selected arc being chosen must become almost 100%. Of course the exact calculation will vary from site to site, depending on how many arcs are on offer. At Chawton for example, where I scripted three arcs (*Entertaining Jane, Women Writers* and *Montague Knight*) and each arc had four distinct kernels (the first and last were the same for each arc), the probability of a kernel from the selected arc being chosen over another is shown in Table 5. For the first six minutes there would be no weighting, but the second kernel has not been played by nine minutes into the tour, it becomes the most likely to be selected. If at 17 minutes it has still not been experienced, it's weight increases to 100% and it will be selected at the next opportunity.

Table 3 Example of how weighting towards kernel natoms of the chosen arc increases over the duration of the experience

Time remaining	Kernels remaining					Time elapsed
	5	4	3	2	1	
39	35					6
38	41					7
37	47	33				8
36	53	38				9
35	59	42	32			10
34	65	46	35			11
33	71	50	39	32		12
32	76	54	42	34		13
31	82	58	45	37		14
30	88	63	48	39	33	15
29	94	67	52	42	36	16
28	100	71	55	45	38	17
27		75	58	47	40	18
26		79	61	50	42	19
25		83	65	53	44	20
24		88	68	55	47	21
23		92	71	58	49	22
22		96	74	61	51	23
21		100	77	63	53	24
20			81	66	56	25
19			84	68	58	26
18			87	71	60	27
17			90	74	62	28
16			94	76	64	29
15			97	79	67	30
14			100	82	69	31
13				84	71	32
12				87	73	33
11				89	76	34
10				92	78	35
9				95	80	36
8				97	82	37
7				100	84	38
6					87	39
5					89	40
4					91	41
3					93	42
2					100	43

What happens if two (or more) different visiting parties enter a space at the same time, and their needs differ? This is something we were not able to test at Chawton because of the lack resource and of visitors. However running the tours and thinking about how arc kernels should be prioritised over the course of the

tour, it seems to me that the clashes might be fewer than I had initially imagined. But it is possible that two groups enter any space with conflicting needs. For example, one group may reach a space after the 24th minute of their visit, and need to experience the third kernel natom of their arc, while in the same space, a group who arrived after the 31st minute of their visit might require the fourth kernel of their arc. Both kernels are weighted to be delivered now, in the same instant, in the same space. All sorts of factors other than time of visit may swing the algorithm one way or the other. For example one kernel may be more appropriate to the space, or one of the groups may be, for whatever reason, running much later in their experience than the other. Whatever the reason however, the effects of prioritisation of one story arc must be mitigated for the group whose arc has "lost out".

A potential solution comes from a game that was based on the story beat principles set out in *Hamlet's Hit Points* (Laws, 2010). *Hillfolk* (Laws, 2013) is a Role Playing Game focussed on what Laws defined as dramatic, internal goals more than traditional games which concentrate on combat, which Laws defines as Procedural. A key mechanic is therefore about players exchanging control of the narrative. A player who lets another take control of the narrative, for any reason, is rewarded with "Drama Tokens" (Laws, 2013, p. 36), which can then be spent to take back narrative control at a future time. An algorithm controlling the competing narrative needs of people in responsive cultural heritage places could use the same principle. If at any point a visiting group must cede the selection of a natom to another group, it is rewarded with a digital token, and the next time two or more groups competing needs clash, the natom selected is the one needed by the group with the most tokens. If I had had to represent this physically I would suggest the arc with the most tokens loses the same number of tokens as the group placed second held.

One further issue on timing relates to the café, where I overheard my respondents discussing their tour. At Chawton, the café is in the historic kitchens, placed where visitors might conceivably choose to break their experience and resume after refreshment. This did not happen on any of my tours, but only because I was a "guide" in their eyes, not an algorithm. Visitors knew they would be with me for less than an hour and could plan their breaks around that. But in a responsive environment, the algorithm should not be counting away the minutes of the experience while the visitors are breaking for lunch. This is a relatively easy problem to fix however. When the algorithm senses they are in the café it simply stops the clock until they move on.

There is an ancillary consideration too. I had originally included the old kitchen in the tour and created natoms for it. Satellite natoms and indeed a kernel natom for the *Women Writers* arc. In testing, the WiFi proved unreliable in the area and so I did not include the kitchens or the associated natoms. But if I had, there was to be a poem about kitchen work that I had recorded. Would that have annoyed diners by endlessly repeating? I argue no, in such a situation the system would identify the devices of the people in the room when it first plays the poem, and tag each profile with a flag that they had heard it. Then when a new party enters the room the system would be aware of that people still in the room had heard the poem, and offer instead another natom. This change from piped music, or audio triggered every time a visitor walks in front of a PIR sensor, demonstrates a real benefit of a responsive environment.

4.5.5 Ambient

Ambient interpretation is ignorable, affective, specific to the place and persistent. This prototype was not ambient, as it was in effect a deconstructed guided tour. But it does not rule out a real responsive environment being ambient. Let us look again at what an ambient interpretation environment might mean. Starting with the most obvious quality of what might be called ambient interpretation, it should have a particular relationship to the location where it is experienced. Most of the natoms in my experiment were explicitly linked to locations/physical objects around the house. There is a degree of flex – the kernel natoms, for example, were linked to locations, but also of course available to be used in other places should the narrative need arise. Ambient interpretation should create a mood in the visitor, which in turn should effect the way they perceive the space they are in. As we have discussed, it is very hard to evaluate affect, and I did not attempt to ask visitors about anything more specific than the statement I have used throughout my research, and which the National Trust asks of its country house visitors “The visit had a real emotional impact on me.” Again the sample size here is too small for the answers to be interpretable, but nonetheless, the answers were unremarkable, there was no indications that this experience was more affective than any other, nor any less affective.

Ambient interpretation shouldn't require being experienced as a whole. The principle behind this prototype is that just six kernel natoms are enough to deliver a satisfying narrative, and that everything else becomes a satellite natom. Of course not every natom in the database was experienced on any of these tours, but that alone does not make it ambient. I think that what makes interpretation ambient is that a full sequence of kernel natoms are delivered

within whatever time the visiting party spends at the property. In the prototype, the tours were expected to last 45 minutes, but flexed with the needs and interest of the visiting party. The flex was limited however by the capacity of the mind of the guide. The 45 minutes is an average, and different visiting parties move though the rooms at a different pace. It is not beyond the capabilities of an algorithm, though, to measure the pace of the visit and adjust the expected length of stay accordingly. Such an algorithm could even measure a change of pace, so if the party accelerate or slow down, the expected duration of the visit can be adjusted on the fly.

4.5.6 Beat analysis

I then re-watched the recordings, noting which beats were selected, each beat's "Rhythm" (up, down, crossed or lateral) - based on its content and its relationship to the previous beat (Figure 43), and the transition between beats.

It is worth reminding ourselves of the system that Robin Laws (Laws, 2017) created to define the beats of the story, which we explored in Chapter 3 (3.7) The foundation beats which move the protagonist closer to, or further from, their goals, are: Dramatic when there is personal interaction; or Procedural where the protagonist interacts with task or physical challenge. Four other types, which Laws calls flourishes are: Commentary; Anticipation; Gratification; and Bringdown. Laws also offers us three "informational beats" (Laws, 2010): Pipe; Question; and, Reveal.

In his later work (Laws, 2017) he adds transitions between scenes to the mix. Some we are very familiar with: Meanwhile; Flashback; Flash forward; and Return - coming back to the present moment. Others are more subtle: Outgrowth; Continuation or Turn; Break and Viewpoint; and, Rhyme.

At first glance, concerns I had while compiling the source material into Scalar are realised. The majority of beats selected were not "foundation" beats - either Procedural or Dramatic - which Laws (Laws, 2017, p. 51) argues should be "the vast majority of beats in a well-wrought narrative." Just 41 of the 257 (16%) beats recorded were Dramatic Beats, and 45 (17.5%) were Procedural.

Figure 43 Beat analysis of one of the tours

Instead, the vast majority of beats in this narrative are Information beats. You might argue that in an historic setting most of the natoms are of course going to be information. But first response to such an argument should be a direction to the foundation text for heritage interpretation: Tilden's second principle (Tilden, 1977) states "Information, as such, is not Interpretation." Tilden does go on to admit that interpretation includes information, but stresses that interpretation is about revelation. And luckily Laws's model includes "Reveal" beats. Can we salvage the interpretive journey of these Chawton stories, if we can show that a good number of the informational beats were Reveals?

I am not at all convinced that what Laws means by "Reveal [- a beat that] provides the information we were made to desire in a previous question beat, or surprises us with new information" is exactly what Tilden was thinking of, but even so, Reveals count for a tiny proportion of the beats: just 19 out of 257, or 7.39%. And

indeed the number of times that a Reveal might be perceived by the visitor may be even smaller. According to Laws a beat is only a Reveal if it answers a question that was posed in an earlier beat, a Question beat. Only four Question beats were triggered by the visitors, so arguably there should only have been four Reveals. The other reveals were triggered by explicit questions from visitors, for example in file IMG_7171, at 12.41, when a visitor asked about a scrap of Morris & Co wallpaper. In other cases, there was an implicit question, where a visitor does not ask a question, but their behaviours indicate that they may be asking themselves or wondering about something they are looking at. For example, in file IMG_7171, at 7.06 and 8.42, the visitor's curiosity seemed aroused by the stained glass windows in the Long Gallery, without a question being vocally expressed.

But actually, even these few Reveals are just facts. The experience may be gratifying, for example when a visitor thinks the wallpaper might be by William Morris, and is pleasantly surprised to have her suspicions confirmed, her expertise proven. But is it the sort of revelation that Tilden was aiming for? I don't think so. The truths of the story are not revealed in the affirmation, none of Montague Knight's sense of loss, as his home and library are dispersed, and very little of his motivation in restoring Chawton, is communicated.

If the majority of the beats are not Reveals, what are they? There were 121 Pipe beats in the analysis, 47% of the total number. According to Laws (p54) "Pipe Beats establish facts that come to matter later in the narrative." He explains that the term comes from screenwriting, and often refers to the expository dialogue or voiceovers that occur at the beginning of a story, citing as examples the facts the client shares when she tasks the detective to look for her missing husband, and the peculiar rules the housekeeper explains to the new governess.

At the beginning of a story, Laws explains, the audience are keen to have the world explained to them in part, but later they will tire of such exposition, and expect the protagonist of the story to earn the information. Of course, in our Untour, it is the audience who gets the information, and they do not earn it in the way a protagonist would. If they ask the "right" question, or probe the "right" part of the house, then they might get a bit of information that rewards them; but in analysis I would have marked that as a Reveal (as above). But there is a strong argument that as these "pipes" rarely connect to anything (for example, at 36:32 in IMG_7180.MOV the visitors ask about a portrait for which the associated natom is "unidentified girl" which is not so much Pipe as Dead End), perhaps they are actually Commentary.

Commentary is one of group of beats that Laws terms “Flourish” - beats which relate to the theme or mood, without moving the story forward. When I was building the natom database, I recognized that the music, and some other sound effect natoms, would fill this function. But before we get to Commentary, I should note the numbers of the other Flourish beats. Eighteen (7%) of the beats which visitors accessed were Gratification beats, “an emotional up moment that does not advance the story”. While they did not advance the story on their own, they were often paired with narration that did take the story forward. For example, in recording IMG 7172.MOV at 18.18, the country dance music accompanied the Dramatic beats Entertaining Jane and Dining at Chawton. I also included a couple of Bringdown beats in the database. These are the opposite of Gratification beats in that they are intended to make the audience sad, or fearful. However, none of these were accessed by any of the participants.

The third type of Flourish beat took on different functions depending upon the context in which it was accessed. The recording of the nursery rhyme, *Lucy Locket*, became an Anticipation beat when it was accessed, and recognized, before the portrait of Catherine (Kitty in the rhyme) Fisher was seen. At other times it was accessed at the same time as the portrait, and so became more of a Gratification beat. In the experiment, there was only one time when the visitor recognised the song and sought out the portrait, providing the only instance when I logged an Anticipation beat.

It could be assumed that one aspect of interpretation is to provide “commentary” on the story. In writing about Commentary beats, Laws comments that they “used to be much more common in literature than they are today” (Laws, 2017). Perhaps it is not surprising, then, that only fourteen (5%) Commentary beats were accessed in the trial. Eight of those were Kernel 1, however, which was not a choice for any of the visitors but the natom with which every tour started. Thus only six (3%) were in fact commentary activated by a visitor’s actions and inferred interests.

Of those six Commentary beats actually selected by visitors, one was a natom about Mary Robinson, and another was Fanny Knight’s own commentary on her aunt, which I had originally judged to be a Dramatic kernel. Indeed, in the context of a costume drama, the natom might be turned into a line of dialogue, and (in that context) become a withering response to a petition of familial love. In this context, however, it was simply commentary. Three Commentary beats were a narrative atom about the family cookbook. It is short enough that it is worth quoting in full to illustrate a dilemma:

> A Knight family recipe book inscribed 'This book I brought from Chawton and gave to my sister Mrs. J. Knight, on whose death it was returned – TK 1793' is a particularly precious survival that gives us an insight into the products of the kitchen in the eighteenth century. Two separate hands appear to have compiled it, their identities now unknown. Alongside recipes for orange wine and 'ragoo' are instructions on the making of household remedies, 'a water to make the hair grow thick' for example.

This is pure "museum description": not too complex or technical, as might otherwise be seen in the catalogue entry; revealing a detail, the inscription that might be hidden from view as the pages are regularly turned to mitigate light damage; making a connection with named and unknown human beings, because humans are always interested in other humans; and offering a light-hearted pick of the recipes, including an archaic spelling of ragoo, and a hair tonic. It is not Dramatic, as it does not show a character achieving their inner goal; nor is it Procedural, as no-one overcomes an external obstacle. It is neither Pipe, nor Question. It MIGHT be a Reveal, though no one asked any question other than "what's that book". It is not Anticipation, and neither Gratification nor Bringdown. It is pure Commentary.

And really almost everything else is Commentary too. Those 121 beats that I classed as Pipe beats in my initial analysis didn't necessarily lead anywhere. When I defined a beat as a Pipe beat I was expecting that it would "come to matter later in the narrative." However, if it didn't, because the participant made other choices, then it stopped being Pipe and became just a fact, or Commentary. Following this logic, and reclassifying Pipes that did not become significant to the later narrative as Commentary, raises the number of Commentary beats from 14 to 135, more than half the total.

I populated the natom database from the newly written guidebook to Chawton House and from volunteer's guided tours, but I struggled to identify the Dramatic and Procedural beats that Laws considers are needed for emotionally engaging stories. I pushed at the limits of each definition to ascribe an emotional rhythm to a sufficient number of beats. The analysis of the experiment outcomes further suggests that much heritage interpretation is not actually narrative at all, but commentary.

This is not the place to argue whether commentary is what heritage visitors actually want, but given that this experiment is about using responsive narrative to make emotional connections, the lack of emotional beats is a problem.

Heritage stories are too often seen as static, looked at from the point of view of "now". They are immutable and therefore inevitable. There is little or no dramatic tension in the story. I should be careful not to generalise here - there exists, or can exist, wonderful emotionally engaging museum interpretation. I already discussed *Life and Death in Pompeii and Herculaneum*, in Chapter 3. Presenting the collection from both towns in galleries that represent a single Roman family home, and reserving the famous, perhaps clichéd plaster-casts, until the very last "scene" drives home a very human, emotive story, which might otherwise have been swamped on commentary.

Other examples include the Museum of Brands which has emotional impact derived purely from nostalgia. The Opie collection at the core of the museum contains packaging from before the twentieth century of course, but a huge proportion of what is on display comes from within the living memory of its visitors. A few moments spent in the galleries, especially the Time Tunnel, observing visitors will reveal more than one person saying "granny had one like that" or "I remember that very version!"

> Memories arise from toys and games that, since the 1950s, have reflected the most popular television programmes. Magazine covers illustrate the change in style and fashion, while colourful posters showcase the product aspirations of each period. Amongst these memories, the Time Tunnel tells wider stories, such as the advance in technology, or the passing of the domestic servant. Along with the emancipation of women, the takeover of the self-service, the benefits of refrigeration and the growth of plastics. (Museum of Brands, 2018)

With those memories come emotions – the fear of their granny's dark front room, the pleasure of spending pocket money on those sweets, pride of ownership, the jealousy of lack. These are emotions the visitor brings with them, and every item is potentially a trigger. The storytelling, the narratives are mostly brought by the visitor too. All the museum does is arrange a chronology to easy navigation and put everything into context.

For the last few decades visitors have brought their own narratives to the National Trust property Chartwell too. The family home of Winston Churchill benefits, not just from a very personal collection, but also the memories and myths of those born before World War II, and those growing up in the fifty years after the war. Maybe as the events of the forties get more distant, Churchill's emotional legacy will fade and Chartwell will lose the emotive advantage it has over another prime minister's house, Disraeli's Hughenden Manor. The National Trust has long

struggled to achieve the same emotional connection with that more distant personality.

What this experiment has shown is that underlying narrative atoms (natoms) of heritage storytelling, if they are based on most current interpretations, are not up to the job of creating emotionally engaging stories. Let me be clear, this is not the "fault" of the visitors' choice-making. If the blame lies with anyone it lies with me, for relying solely upon "the corpus" of existing interpretation about the place, the guidebook text and recorded guided tours. I was simply not as creative as I had been creating the natoms of *A Walk Among the Ruins*. I shall explore some of the reasons why I felt constrained in Chapter 5. But the fact remains that I was using existing interpretation, created in the most part for a forthcoming guidebook. It illustrates that so much of what we (by which I mean heritage professionals, curators, researchers, historians) have assembled in the way of story is actually what Laws calls Commentary, as the analysis of the Chawton experiments demonstrates. "They activate the intellectual over the emotional" Laws (2017, pp. 56-59) says, and you "can expect to lose attention quickly if the content [...] fails to utterly compel from one moment to the next." A compelling story shows rather than tells. Despite Tilden's exhortation that interpretation should be not information but revelation, the currency of heritage interpretation is mainly information.

The challenge with trying to make interpretive media more responsive, particularly in museum and historic house settings, is that this type of procedural storytelling relies more on data, and less on action. Were I a National Park Ranger like Tilden, I might catch a beetle and have it crawl over the hands of my audience, or rub a piece of bark between thumb and forefinger to demonstrate its friability. In the confines of Chawton House, the only actions available to my audience are walking around and looking at stuff. Most of what they see they cannot touch. The actions available to the environment (me in this case) are casting a light upon an object (with very limited success in this experiment) or conveying data, information, as music or text. Thus the nature of that information cannot just be commentary, if we want it to be emotionally engaging.

An excess of commentary though, is just one problem. The Dramatic and Procedural beats, at least in this experiment, are not only too few, but neither do they work hard enough to create dramatic tension. In Chapter 3, I discussed Up beats and Down beats - the tension between Hope and Despair. Laws (Laws, 2017, p. 127) suggests that the overall directory of a graph of those beats should

be a “slowly downward sloping line”, and illustrates this with the graphs of three classic stories.

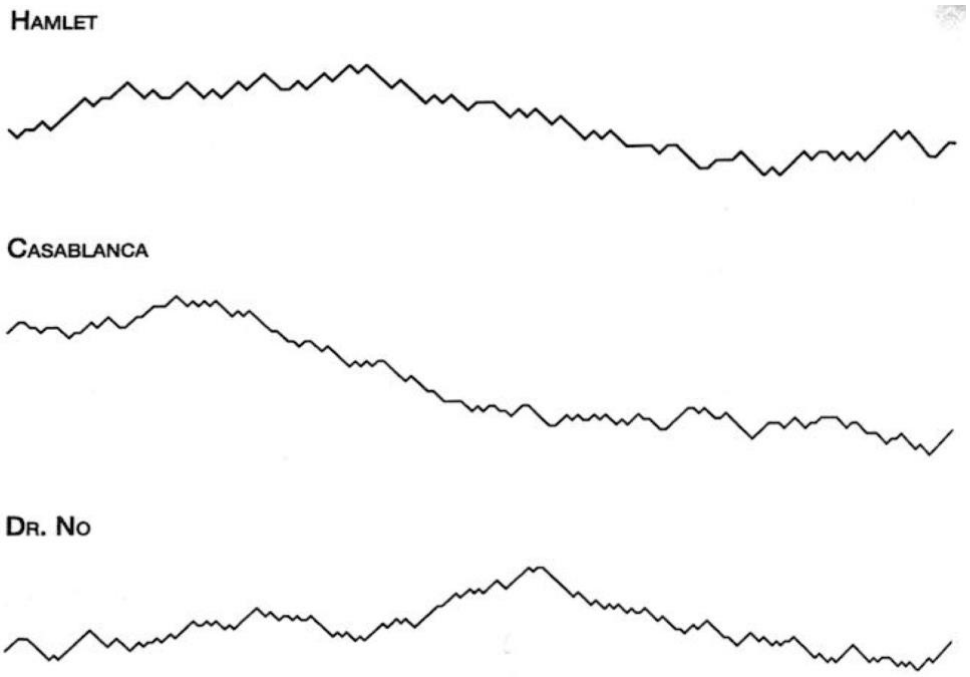


Figure 44 Beat trajectory graphs of three classic stories

(Laws, 2017, p. 128)

But, the graphs created by my procedural stories are gently *upward* sloping (Figure 45). Laws does not argue that this pattern is “a flawed structure or unsatisfying emotional line. It might perfectly suit your intentions.” (Laws, 2017, p. 128). But it does indicate a basic problem with heritage stories. The custodians of places and objects that have, against the odds, survived to be experienced in the present day, assume that the story of that survival should be explained. All too often the story of an object is: thing created, changed hands, events happened, thing survived, was collected, here it is to look at. The survival of the heritage is a hopeful thing. Sometimes it is set against fearful, emotionally powerful story beats, such as the destruction of Pompei and Herculaneum, but more frequently the thing survived because it was always cherished, or because it belongs to a class of things that at some point lost their value in society and were (apart from this and few other examples) thrown away.

Figure 45 Beat trajectory of tour IMG_7174/5

My point here is that the story of an object's survival, while it may be remarkable, does not have the emotional weight of other stories that the object might illustrate. I am not however proposing that the survival stories are not used at all; the conservation principle is the foundation upon which the profession of interpretation is built. Conservation messaging, encouraging the audience to value the heritage, and support those looking after it, is vital to the mission of organisations. But it is not the strongest way to engage people's emotions.

I struggled, as I put the database of natoms together, to find beats that would engage emotions, but I wanted to restrict myself to the existing corpus of knowledge, including the draft of a new guidebook, volunteer's tours and some primary source material to build the natomic database. Now I am less certain of the value of facts in emotionally engaging interpretation, and more convinced that I should have embraced fiction. The team behind *Ghosts in the Garden* had after all created fiction out of very sparse court records, and provided their participants with the facts in a leaflet handed out after the experience (Poole, 2018). In retrospect I missed a trick, I had author of fiction, a key contributor to the English canon, a vitally important one even, in Jane Austen. With her influence on the Spirit of Place at Chawton, I would have been justified in creating a fiction for this experiment - a story with emotional ups and downs, characters that can have dramatic scenes with each other, and which doesn't automatically end with "… and this is where we are now." Such a story need not be entirely fictional, the fiction would provide the dramatic and procedural beats upon which to hang the factual commentary and other flourish natoms.

4.5.7 Transition analysis

What the experiment highlights about procedural storytelling is the importance of transitions. In a scripted, sequential narrative, like film, novels, or comics etc. the transitions are intentional and take full advantage of the medium – the turn of a comics page, the ellipsis at the end of a chapter, and the many and varied cuts, wipes, fades and audio editing of film. The transitions indeed amplify the momentum of the story.

There is less control in a procedural narrative, because the user controls which will be the next natom. In a truly responsive story, the transitions are defined by the choices the visitor makes. The visitor is not an author, and not considering the story's momentum. So it is vital to understand what transitions the visitors at Chawton created, through their choices and expressed interests.

Seven, or 3% of the transitions were Outgrowths. Laws (p61) describes an Outgrowth as when "the narrative develops from a consequence of the immediately previous scene" even though the time or place of the scene, or even the focal character, can change. As he says "the Outgrowth transition builds strong [narrative] momentum." Does a relative paucity of Outgrowth transitions in the procedurally generated stories here presage a lack of narrative momentum? I think it does. But there is another transition that was more prevalent in my analysis of the tours, which almost does the same job.

Laws defines a Continuation as "the transition between two scenes featuring the same focus character in pursuit of the same goal." (page 61) The action doesn't have to follow on directly, as a consequence of the previous scene. There were 78 Continuation transitions across the Chawton House Untours, 30% of the total number of transitions, which does give the narrative some momentum.

There was just one example of a Turn transition. A Turn is where the focus stays with the same viewpoint character, but they now pursue a different goal. In this case, Montague turns from leaving a message for the future, to celebrating his past. Laws describes it as the third smoothest transition, after Outgrowths and Continuation, still retaining some narrative momentum.

A Break, on the other hand, is a transition that costs momentum. Laws describes a Break as a transition that "either introduces, or picks up on an entirely different plot thread [...] A Break transition costs you momentum, as you have to reestablish the [audience] attention with the new set of circumstances and the hopes and fears that flow from that." There were 114 Break transitions in the data, 43% of the total. Actually more than half of the transitions (54%) turn out to be Breaks of a sort, when you factor in Viewpoint transitions. These are just like Breaks, except they mark the first appearance of a new character. There were 27 of these transitions, to add to the total number of Breaks. That is, over half of the transitions were ones that *cost* momentum. This might well be a factor that put the damper on emotional connection with the narrative. Laws does argue that the momentum cost of Breaks can be mitigated, "if you have laid the groundwork for the audience to anticipate the resumption of this other plot thread" but in a truly

responsive story, it would be very hard to predict which natoms and thus plots might be selected.

I categorised seventeen of the transitions (6%) as Rhymes. This might be a slightly problematic classification, because Laws gives examples of Rhyme transitions that are entirely visual, for example, the flung bone spinning in air before transitioning to a Pan American space shuttle manoeuvring in orbit in *2001: A Space Odyssey*. According to that principle, none of my transitions would be Rhymes. In our three dimensional space, using the procedural method, we lack the authorial control to create a true Rhyme transition like the examples Laws uses.

But Laws says "a Rhyme takes a Break transition and smooths it over [...] This link creates a harmony that would otherwise not exist, but does call attention to itself" (Laws, 2017, p. 64) Reviewing the video evidence, I recognised that one type of natom was doing much the same function in the procedural narrative. In his model, Laws does not separate out music. But in my responsive narrative, music is a separate element. Being careful not to be swayed by words in Laws's text such as "Rhyme" or "Harmony", I observed that in most cases, the musical natoms that were activated had the effect of smoothing over Break transitions. It might be said that my Rhymes actually rhyme.

There was also another type of Rhyme, which occurred once. At timestamp 13.25 in video IMG_7175.MOV, the visitor found resonance between the subscription funding of the eighteenth-century novel *Camilla* and modern Kickstarters, overlaying these two very similar models of patronage (although separated by centuries and the analogue/digital divide) seemed an to create a real connection between story and visitor.

Four of the transitions that Laws defines are difficult to apply in the context of heritage storytelling because they relate to movement in space and time. They are: Meanwhile, Flashback, Flash Forward and Return. As the name implies, Meanwhile transitions occurs simultaneously with the previous scene but in a different location. None of the transitions in our story were like that. Flashbacks and Flash Forwards might, one feels, be easier to apply. After all, we are shifting out focus between the twentieth century and the nineteenth century, and with some of the *Women Writers* natoms, even earlier.

But, the time frame of heritage storytelling is not often fixed: from the "now" everything might be considered a Flashback. A leap forward in time from the

sixteen to the nineteenth centuries might not be considered a Flash-forward, and might never be matched with a return to the sixteenth century.

With the caveat that they are difficult to define, in a heritage context I counted fourteen Flashbacks (5%), and six Returns (2%). There were no Flash-forwards or Meanwhiles.

Reviewing these transitions it is evident that the story frequently loses narrative momentum. Of course the reason for that is simple; the narrative choices are made by the actions and behaviours of the visitor and they do not see themselves as the author of a story. It's not as though there was a "would you like to know more?" option at the end of each beat.

That said, there was an incredibly complex and sophisticated algorithm judging the visitors' actions and biasing the system's reactions towards maintaining narrative momentum: me. And despite my best efforts almost half the transitions were Breaks.

This experiment has underlined the importance of considering transitions between natoms. In the network diagram of responsive interpretation, edges should be considered in this way. It should be possible to define the relationship between two vertices, or natoms as a transition. Is it, on its simplest terms, a Continuation, Outgrowth or a Break? Potentially, the edge will be directional - the story can go one way, or what is a Continuation in one direction becomes a Flashback when experienced the other way around for example. Flashbacks bring up another point. In most cases, where a possible Flashback (or Flash-forward) transition has been identified, a Return must be scripted, it can't be left to chance, as it was at Chawton.

These issues, with both transitions and beats, suggest writing for a responsive, ambient interpretation environment will require a paradigm shift in the way curators and other cultural heritage professional think about storytelling. The nature of the paradigm shift will be discussed in the conclusion.

Chapter 5: Conclusion

In Chapter 1, I set out the aims of this research. I asked what real-world cultural heritage sites might learn from the video games industry about presenting a coherent story, whilst giving visitors freedom to explore and allowing them to become participants in the story making. I also set out to explore if and how cultural heritage professionals would have to change their storytelling practices to properly take advantage of the new digital media. As might be expected from this sort of auto-ethnographic research, working on my own, with many false starts and changes of direction, my methodological approach has not been consistent. To begin with, although it did not start out as an auto-ethnographic approach, however I was journaling and reflecting upon my experience from the outset. That journal, I realised, was a more insightful record than many of the other data I collected. For example I relied on questionnaires to gather data on visitors's experiences of interactive storytelling in Bath, Bodiam and Chawton, when on reflection, especially considering the small sample sizes involved, guided interviews might have been a better method. The real learning has been about the process of trying to translate a linear interpretation - Chawton's guidebook and other sources - into a network of natoms that an algorithm, rather than a human, might deliver to visitors.

I have drawn some conclusions that may appear to be critical of the heritage sector, that might seem to suggest heritage professionals are failing. This is not the case. In his book *Designing Games* Tynan Sylvester suggests that game designers might learn about interactive narrative from cultural heritage:

> If we look around, we find interactive narrative everywhere. Museums and art galleries are interactive, non-linear narratives where visitors explore a story or an art movement in a semi-directed, personal way. Ancient ruins and urban graffiti tell stories...
>
> These interactive forms - museums, galleries, real spaces, and life - should be our first touchstones as we search for narrative tools. These older forms address our most fundamental challenge: creating a story that flexes and reshapes itself around the player's choices, and deepens the meaning of everything the player does. (Sylvester, 2013a, p. 137),

Sylvester points game designers towards the heritage industry (and elsewhere) to dissuade them from focusing on cinema as the sole source of narrative instruction. So what follows is not a condemnation of museum and heritage practice, but rather a recognition that they are different approaches to the same objective, and that just as games creators are urged to see how cultural heritage does things, so too might heritage professionals benefit from exploring how games tell stories.

The practical learning was that when it comes to mapping emotions - simplicity is best. I initially had tried to assign affect values to the story based on the model I created for Chapter 2. This proved overly complex in practice, with little added value in return. I resorted to trying instead the simple “up” and “down” beats that (Laws, 2017, p. 48) describes. But I soon discovered that the nature of many, or most, of the natoms I had created out of the guidebook text and volunteer’s tours were neither up, nor down, but lateral beats that didn’t really engage the audiences hopes or fears in any way. Indeed, it made me question the very principle of “emotional impact.” It didn’t seem to be an intent of the interpretations I was adapting, and I made me wonder if “emotional impact” is even a good way of describing the connection with visitors that cultural heritage sites really want. In Chapter 2, apart from the model of affect, I also looked at the limits of the traditional interpretive philosophies and methods in cultural heritage, mobile interpretation, and the challenge of emotional engagement. I mentioned the concept of *numen*, which I think might be a better ambition for heritage sites. It’s not easy to define, but Cameron and Gatewood (1998, p. 118) say that “best quote illustrating numen-quest [is] ‘I want to feel the aura of the period, gain a sense of connectedness with the way people lived. I want to have used my mind to experience it, not just the externals.’" Getting people into a numinous state is, I have concluded, what organisations like the National Trust really mean when they talk about emotional engagement. As we have discussed the sample size here was too small to meaningfully ask the sort of questions like “did you feel connected with the past?” so there is work still to be done on methods to evaluate numen.

Let us assume in the meantime, that nothing was observed that indicated a numinous outcome for any participant in the Chawton experiment. To the contrary, I would argue that the nature of the stories generated, which tended towards placing the visitor as a distant observer of the past, rather than a participant in the story, might have made it even more difficult to experience numen. I still believe however that it may possible to use this personalised storytelling to encourage a numinous response. Numen is part story, part ritual.

It's a 'shared experience' but not one you necessarily share with those around you. Instead you share it with those that have gone before and who will come after you. It is an inward looking experiences, almost a meditative one, and I posit, you are more likely to have it on your own. It comes when you are able to reflect on stories you have heard while following in the footsteps of others.

The sort of responsive environment I am envisioning could well increase the opportunity for a numinous response in visitors, especially if the ideas of persistent interpretation and co-creation of natoms is embraced by cultural heritage sites. Potentially, visitors might be connected to the people of the distant past though the recollections and storytelling of more recent visitors. Their physical presence in the place, and/or surrounded by the collection, could potentially be augmented with the cultural presence envisioned by (Pujol & Champion, 2012, p. 89). Not in their virtual worlds but in the "warped reality" (Pine & Korn, 2011, p. 21) of a responsive environment. But to make it work we need to understand how to create and mark up the natoms of the story for this potential new paradigm. That is what this research has really been about.

Comparing the Chawton experiment with the Clandon prototype, the reactions to both are not comparable, as different things were being tested, and the audience for one was a select group of peers, while the other was a sample of the general public. That said, it seems that the more successful of the two, as a work that moved users towards numen, was the prototype. There are two obvious reasons for this.

Firstly the Clandon experience was focussed on media - text, pictures and sound. The storytelling media, without the "distraction" of the inherent fabula of a physical site, was able to engage the users' emotions, as they imagined the spaces, rather than experiencing them. They were not "present" in real space or a virtual one, but they were very present in the imaginary space where (to echo the introduction to *The Outer Limits* TV show) I controlled the vertical and the horizontal. The sound elements, for example, had far greater impact, registering in the reviewers feedback, in a way that suggested a numinous moment, rather than being observably ignored by the participants at Chawton.

More importantly, I had no restrictions on my storytelling at Clandon. I wasn't doing it for the National Trust, or their members or customers. I was doing it for myself, inspired by the place but not limited by it.

Here, I should include a fact that seemed a minor inconvenience at the time but upon reflection had a great deal of impact upon what produced. I was working for

the National Trust, and felt it was only right that I should seek permission from my line manager and others in the National Trust before proceeding. My line manager didn't not identify a conflict of interest, but the communications and marketing person with responsibility for Clandon strongly advised me against proceeding. They were rightly concerned about the sensitivities of the many stakeholders including the historic family and staff at the property. So I considered other subjects, but every time I returned to Clandon. In the end I decided to act against the communications and marketing advice. I would enter the competition as a private individual, not as a representative of the National Trust and I would avoid talking about the work on any networks connected with the Trust. Of course I wrote with awareness of the sensitivities involved in the great loss of heritage, and the stakeholders. However I did not realise until much, much later, when I was working on the Chawton experiment, that this decision had liberated me from constraints I might otherwise have put-upon myself if I had written as a representative of the National Trust.

I did not have a cohort of curators, marketeers, volunteers and members of the historic family looking over my shoulder. None of them would even see it, let alone input to it. I had an enthusiastic co-creator, but she was inspired by the sonic problem I set her, and had no further interest in inputting into the story. I was in the purest sense, the author of the experience.

At Chawton on the other hand, I was a guest in somebody else's house, and representing that house, and the organisations behind it, to the general public. Here there were curators, marketeers, librarians, directors, volunteers, and even historic family members interested in what I was doing. They were helpful, not at all critical, and let me get on with what I was doing without much interference. But the limitations were implicit, I did not give myself the creative freedoms that I had with Clandon. I felt, if not experienced, the eyes of all those stakeholders looking over my shoulder.

On the Clandon project, I saw myself as an artist, a rebel even, at liberty to create the experience I wanted. With Chawton conversely, I realise I had imposed restrictions upon myself, almost subconsciously, that I think offer insight upon the restrictions that heritage organisations generally might impose upon themselves, consciously as individuals within the organisations making decisions, or subconsciously as an organisation self-censoring their work. There are three implicit limits placed on the creators on heritage interpretation.

1. Heritage has "authority"

Acclaimed historical novelist Hilary Mantel says “Historians are sometimes scrupulous and self-aware, sometimes careless or biased. Yet in either case, and hardly knowing which is which, we cede them moral authority. They do not consciously fictionalize, and we believe they are trying to tell the truth.” (Mantel, 2017). Writing for Chawton, I represent a complex collective of stakeholders: the Knight family that owns the building, the Trust that leases and maintains it, the University that co-manages the library, the staff and volunteers that run it, the visitors and other supporters that sustain it. Furthermore I represent the core idea that binds this group of stakeholders together - that Chawton has some value that means it should be saved, preserved for society. I asked for permission to conduct this experiment there, and with good grace, they gave me permission. I therefore feel I must return the honour they have given me and not betray the trust they have invested in me.

I have a responsibility towards them to represent their work without flippancy. So, and especially so as I am an incomer, not one of the stakeholders who has immersed themselves in the place for years, I limit myself to the facts, to what others have written, or said about the place, to “authoritative” sources. I felt beholden not just to represent the authority of the stakeholders, but to become the authority. I self-censored myself. I did not have the authority to make things up. In contrast, at Clandon, I expressly did not have permission from the National Trust to create my Twine prototype. Had I been given permission, I am sure it would have come with caveats, an approval process and (in those sensitive times shortly after the fire) a heightened sensibility to make sure things are “right”.

2. Professionals have “reputation”

The sources I was drawing from for Chawton included learned amateurs such as Montague Knight himself, but also historians and librarian and other academics. Many people who work in the heritage sector are academics of one sort or another, whose career progression depends upon publishing peer reviewed papers that expand the corpus of knowledge about their particular area of expertise.

To create most of the Foundation beats that Laws defined, especially the Dramatic beats which essentially involve two characters in conversation, I would have to invent those conversations. In some lucky cases, a curator could point to, say, written correspondence that we could adapt. But in other circumstances I might have to invent words to put into the mouths of historical characters and take a guess at motivations and emotions responses, or even invent characters to

play out dramatic scenes. Mantel (2017) recognises this problem "From history, I know what they do, but I can't with any certainty know what they think or feel."

This was not a problem for me at Clandon. I gave a voice to Hinemihi, the Maori meeting house, and put words into her mouth. I dramatised the story of Edward Onslow, and invented a plantation slave and First World War soldier. At Chawton I found myself reluctant to do this. I felt a responsibility to the professionals who have given me their work, in one case a draft of a (then) unpublished guidebook. This would not be a problem in film and TV. Many academics have lent their expertise to fictions based on really stories. In recent years both *The Mill* and *Gentleman Jack* have created dramatic scenes based on primary sources and with the co-operation of reputed academics. So why was I reluctant to create a fiction for Chawton? The Clandon story was removed from the place, and presented on a computer screen, and I think that is a vital distinction. At Chawton, I was working in the place, and the place is the summation of all the research and work of the professionals who restored it and look after it. To add fiction to my procedural tour would feel like taking the manuscript of the curator's PhD thesis and crayoning a comic strip over the text.

3. Visitors don't seek "doubt"

It has long been recognised that cultural heritage managers and organisations are seen by most visitors as the source of truth. It has been an issue for archaeologists for example, especially since the advent of realistic CGI for visualising what buildings might look like. Archaeologists Frankland and Earl (2011), express frustration that people accept visualisations, and are reluctant to explore the process by which they are arrived at and the many, many possibilities that are not represented in the model.

If cultural heritage sites are going to challenge these assumptions, test them, then a flexible, dynamic approach to interpretation is required. Responsive environments, as I envision them, are by no means the only approach a cultural heritage institution could take. However the philosophy behind them, of showing not just one interpretation but many possibilities, is a way to test what visitors really want. It's ambient nature lends itself to dynamic, always changing, always being updated interpretations, ignorable in the background and interesting in the foreground. As this was an (un)guided tour, the guide was not ignorable. While trying not to lead the tour, rather standing back and looking to the visitors to demonstrate their interests and the direction of the tour, the guide was always listened to when speaking. However in a responsive environment, wherein a human guide does not deliver the majority of the ephemeral natoms, there would

be more opportunity for visitors to vary their levels of engagement. There was little evidence, in the video record, of visitors actively listening to the audio natoms or responding changes in lighting. I had thought of this as failure of the experiment, a symptom of not having enough control over the whole environment, but it suggests that for some visitors, parts of the Untours were indeed ignorable in the background, but could also have been interesting and in the foreground for others.

However ambient persistence is not just about the timing of the tour. In his discussion of ambient gaming Eyles (2012, p. 109) argues that an ambient game would continue, playing on behalf of the player, without the player giving their attention to the game. Applying that principle to an interpretation environment makes for an interesting idea about presenting a place. The narratives of course still exist without anybody experiencing them, but in this example at least, they don't develop. Applying Eyles' principle one can envision an interpretive thread which changes though out the visit, even when visitors are not paying the attention. For example, there might have been a narrative thread at Chawton that recounts the daily life in the house and the duties of the servants. Visitors in the morning might experience the scullery while the servants wash up after breakfast, then in the afternoon, other visitors might hear the servants consult the Chawton cookbook (an unusual surviving document in the house) on a recipe for the evening meal. This idea could extend though-out the year, the cookbook recipe being consulted might vary with the seasons for example, or the house might be preparing for Christmas festivities, or the documented visits of Jane and other visitors. Musicians might be heard setting up and practicing for balls on the dates that we know they took place.

Thus, the interpretation could be changing throughout the year, or indeed from year-to-year, as long as the content creators continue to research and add it to the database. Those content creators could be drawn from a wider pool than the curators and other professions that traditionally produce the majority of cultural heritage content. Simon (2010) has had a huge influence on co-creation – involving the audience, and especially new audiences, in the creation of content. It addresses some of the demands that Staiff (Staiff, 2014) made "for facilitating choice and for being able to deal with the unauthorized, the non-conforming, the unpredicted, the subversive, the playful, for imagination, creativity and newly performed responses [...] for experiences that are not necessarily born of the information imperative."

It is not a thing to be undertaken lightly and involves a great deal of investment, but such content, especially if is part of an on-going programme and not a one-off project, makes the interpretation a living, changing thing even when visitors turn their attention away.

Fiction is the gift of games to cultural heritage interpretation. We should be braver in our storytelling, not sticking rigidly to "what is known". The facts of the place and collection can illuminate the stories we tell, but should not dictate them. We should create stories that reveal the truth of the spirit of place, even if the stories themselves are works of fiction. People are accepting of fictions, if they know they are fictions. Heritage can present itself as an author of fiction based on fact. Just as heritage conservation makes clear what is original and what is restoration, we can do the same with our narratives.

Sometimes the place and/or collection will provide potential emotionally engaging narratives without fiction. Very often however they are missing the features of a good story. They don't need to be literature, but the games I looked at showed that they should have some of the very basic elements of a good story, such as:

- An actual story arc;
  For example you could argue that the story of Maggie Greville, the bastard/orphan who was adopted by the Brewer William McEwan and ended up hosting royalty at Polesden Lacey, is a rags-to-riches story, but if we only talk about her life while at Polesden Lacey, we are missing out on the actual story
- A properly defined protagonist;
  The heritage industry tends to portray the heroes of our stories as people or families to whom history happens, even when they are obviously pro-active creators. Actually there is a dichotomy here, most protagonists of the "old" history are privileged, "Great Men" as it were. As "new" history has moved towards better representing the majority population, we find a different set of records. Unlike the stories of Great Men, the records of the masses are less complete. But we have seen how interactive stories like *Ghosts in the Garden* can take modest records and create compelling stories with active protagonists. All that said, even when heritage tells the story of "Great Men" (or women), active protagonists, we often do so in a dry, passive factual way that neuters them. Why? I think it's because we treat them as Iconic Heroes, unchanging against the chaos of the world. But iconic heroes are only

gods or superheroes. To engage our visitors emotionally our heroes should be transformed in some way by the story we are telling.
At the heart of this is the key difference between the facts of history and the fiction we should embrace. The distinction between the outward facing facts of history (what a person did, wrote or said) and the inner thoughts, what they felt, which by necessity as Mantel (2017) says, must be fiction. Packer and Bond (2010) suggest that museums should "explore ways in which introspective experiences might be encouraged and supported" – while we insist on authenticity in our storytelling, we are privileging cognitive experiences over introspective ones

- Conflict;
  By saying our stories should include conflict I don't mean it has to be an argument or fight versus an antagonist, though that's good too. Laws defines a dramatic beat as "one character pursuing an inner need for emotional reward, which she seeks from making a petition to the other[…] The second character may or may not choose to grant the award." (Laws, 2017, p. 51) The "conflict" here is that negotiation.
- Supporting Characters.
  Adversaries, rivals, authority figures, sidekicks, companions etc. Sometimes heritage gifts these characters a name only. A "bit part" as it were. Our stories should afford them power to impact upon the story and to somehow play out the negotiation of the threat they pose or the aid they can offer.

All of these elements are evident in the novels the Jane Austen wrote. Reflecting on my writing for Chawton, I realise now that despite the limitations I had unconsciously set myself to stick to the facts, Austen's close relation to the place would have given me license to create a fiction, with all the elements listed above. The facts of the place and collection, become commentary and illuminate the fiction.

With these essential narrative elements, and an algorithm based not just on the emotional beats, but the transitions between, them we are getting close to really engaging stories in heritage. Stories that reveal truth.

So what next? The Chawton experiment answers one very simple question. Yes, it is possible to break linear narratives into Natoms and present them in personalised tours, which are received well by participants. There are many more questions raised by my research that future work could answer.

An exciting prospect would be an attempt to use the storytelling philosophies developed here, and beat and transitions tags I used at Chawton with the meSch software that was not yet available when I was casting around looking for a database to build my natoms in. The meSch project shares many aims with my vision for responsive cultural heritage environments, including personalised experiences, dynamic content for interactive displays and a desire to move away from handling mobile devices to interacting with the environment including physical objects. At the heart of all these interactions is the software designed for curators and other heritage professionals, not technologists or coders, to use. Each narrative element in that system is annotated with "*semantic dimensions*" (Not & Petrelli, 2019, pp. 19-25) which include some of the tags I used, for example, connections to places or objects, and whether they are kernels in particular narrative arc but don't include an affective element. It would be very interesting to experiment with including Laws' beats (up or down, dramatic or procedural, etc) in that system's semantic dimensions, and then to see if meSch could emulate the decision-making behaviours that I demonstrated, using it's "Pseudo-Algorithms." Such a system might also experiment with different ways to gauge the visitors' attention, comparing how accurately a system might measure attention from simple movement tracking, compared with, say a headset with image recognition software that tracks the visitors' gaze, and/or an app which the visitor uses to register interest. My hope would be to find a way to leave the device in visitors' pockets.

The ideal place to do this would be at Chawton again. The first thing I would like to test in a situation with an algorithm working out which natoms to deliver, is the "token" solution, discussed in Chapter 4 (4.5.3), to the negotiation of different groups needs in the same space. But alongside the natoms created from the guidebook, volunteers guides and other sources, the next Chawton interpretation should include a fictional element. Perhaps a story adapted from any of Austen's novels, or a new story (which might better fit the "new media" paradigm) inspired by her writing. A writer experienced in interactive narrative might create sets of fictional natoms, that complement the existing factual natoms. Vital learning from such an experiment will be the degree of acceptance by visitors of such fictional narratives. If one were to ask visitors if they prefer fact or fiction from a heritage visit, I am sure that the overwhelming response would be a demand for fact, for authority and not for doubt. But if you could measure the degree of engagement with a fiction, and indeed the retention of learned fact from a fiction, we might find a different answer.

The adaptive nature of the responsive environment, lends itself to A/B testing. Half the sample could complete the experience weighted towards factual interpretive natoms, and the other half could be weighed towards fictional natoms. Testing the comparative impacts of the two approaches on the audience would be a challenge, but a better resourced project might use some of the methodologies tried by Economou et al. (2018). Possible metrics could include engagement with the story, information retention, or using biometrics to measure responses. That said, as we discussed in Chapter 2, measuring "emotion" with biometrics is not a science without controversy. Which bring us to another potentially useful avenue of research.

How can we better test for a numinous reaction? It seems that there is still more to do to define numen, as it applies to cultural heritage experiences, and then to test for it. The literature uses a number of terms, presence, cultural presence and numen, to point to expressed desire for the "aura of the period" and "connectedness" (Cameron & Gatewood, 1998, p. 118). However It's not just verisimilitude as presence experts would argue. Neither is it having to adopt the behaviours of the past to interact, as cultural presence theorists might suggest. Crucially I don't think it's being told stuff either, Cameron and Gatewood's correspondent wanted an internal sensation, not "the externals". It might be a multimodal experience, with a number of factors.

There is potential to test each of those factors. Do traditional interpretation techniques set up the "revelation" as Tilden termed it? Does numen require an opportunity for reflection, without interpretation interfering, distancing the visitor, in the now, from the historical moment? Is numen a solitary moment? Can it be shared with only with a close companion, or with larger groups and families? Does numen require silence? Or, as I thought I had achieved with my Clandon prototype, can it be triggered with sound?

Reviewing the literature on narrative and emotion in games and, in Chapter 2, the technologies of heritage interpretation, I discovered two gaps in the corpus. This work has been focussed on one, personalised responsive narrative. The other is an absence of serious research on the impact of sound and music in heritage spaces. I have become aware of how important music is to the storytelling that occurs in some of the most applauded video games. Music in games has come a long way since the 8-bit bleep of the 80s. Something I think I was only actually aware of when I started playing *Dear Esther* for this research. I was so impressed with how the music added to the atmosphere and helped tell the story, that I was

not surprised to learn that the composer, Jessica Curry, had been nominated for a Bafta for her work on the game.

Indeed, in 2017, people were still talking about a moment of music in 2010's *Red Dead Redemption* (Heritage, 2017). The simple fact that so many people talk about this moment in their appreciation of the game, indicates that the music contributes to an emotional, memory creating, response in the player. Visitors rarely talk about the use of music in interpretation. There is scope for cultural heritage to use it more imaginatively. Many examples of music and sound in interpretation occur through headphones. This tends towards an insular, individual experience. Lots of people enjoy audio guides but many people seek a more social learning experience in museums. I have some questions that need answering, and while there is a growing library of academic study (eg. *Sound Heritage: Making Music Matter in Historic Houses* In press) there should be further research to answer some of them. How can places use sound and music in a more open, participatory manner? Similarly, many people visit outdoor locations in part to enjoy the sounds of being in the open air. Can we design musical experiences that make space for, or even amplify some of the ambient sounds that may be occurring around the listener in the non-virtual world? Lots of the music we hear in cultural heritage interpretation is bought off-the-shelf - existing recordings, licensed or borrowed from royalty free collections. Occasionally new recordings are made of music historically connected with the site. More rarely have new pieces of music been commissioned to help tell the story of site. Why doesn't this happen more often?

In cultural heritage places, rather than collections, ritual might be a factor too. Can we test the understanding that as a visitor you move through spaces in a way that people generations before, or even other visitors before you, have moved through them? Perhaps collections can test ritual as a factor by creating handleable replicas? My argument is that using a responsive environment would be an ideal way of testing these ideas because, for example, a responsive environment can be programmed to *not* serve natoms to the visitor when it predicts that a moment of reflection might trigger numen.

What the responsive environment cannot do, by itself, is test whether it successfully triggered numen. That requires subsequent confirmation, possibly by asking the sort of questions used by Othman which I discussed in Chapter 2. This is because, as currently envisioned, a responsive environment receives no feedback from the visitor other than data relating to location and movement. Even that raises another research question.

How would people react to being tracked? Public awareness of how internet services, and mobile devices collect data from users, including location data, is growing. So far, society seems to have been willing to giving up a deal of personal information in return for cheap devices and free services, but government legislation increasingly classes location data alongside other personal data which at the very least should be kept secure, and for which the individual's express permission should be sought. People have thus become more aware of the value of their location data, and might not be as willing as, say, a decade ago, to let cultural heritage institutions track them around the site.

The National Trust place, Grey's Court, would be an ideal venue to test visitor's reactions to being tracked. Once a childhood home for Ian Fleming, the creator of James Bond, the best known spy in the world, it could be turned into a responsive environment about surveillance. Visitors would explore the place looking for a spy, finding out a little about its factual history on the way. The conclusion would reveal that the "spy" had in fact been in their pocket the whole time - their own mobile phone. And then of course, we could survey them with questions about the ethics and personal opinions of heritage places tracking their visitors.

Another valuable experiment would test the concept of a responsive environment to deliver different, perhaps conflicting narratives to different audiences. As I write this paragraph, Black Lives Matter protests inhabit the streets of cities across the world and our heritage values are being questioned. Statues of confederate generals and slave traders are being torn down in the United States and Britain. Museums and Heritage sites around the world are also closed because of Covid-19 precautions, but when they open many will be scrabbling to react appropriately to quickly changing attitudes in society. In 2007, the National Trust commemorated the bicentenary of the Abolition of the Slave Trade Act with an exploration of some of the stories that connect the places they look after with slavery. Those temporary exhibitions and other interventions were probably dismantled, and hopefully archived, before 2008. It would be interesting to test, if the natoms of those stories collected and tagged in a responsive environment's natomic database, how quickly they might be selected automatically by the changing needs of the audience, or a proportion of it.

While I have been looking at digital stories in physical places, the pandemic of 2020/21, has brought about new thinking concerning digital spaces, much of which should be examined as heritage re-opens. Such a future is imagined by Galani and Kidd (2020, p. 300) in a paper too recent for inclusion my literature review.

> In museums in the wake of the pandemic – together with the sweeping call for change of the Black Lives Matter protests and debates about the decolonization of our physical surroundings – materiality is likely to remain in predicament. Understanding material encounters as part of a continuum inherently embraces reflexivity, 'flux', 'in-betweenness' and 'liminality' and is, therefore, fitting for these times.

The pandemic has forced cultural heritage to make a "pivot to digital", with varying degrees of success, by the current pandemic. We know that the initial rush to apps that heritage made, in the decade after the introduction the iPhone, ran out of steam as use of devices on site, and downloads were low, and the projects were often made with capital investment with no understanding of how maintenance and updates would be financed or managed. But in the last eighteen months, museums have turned to the web, if only to retain mindshare during the pandemic. We saw a number of examples of imaginative attempts to connect locked out humans with digital representations of cultural heritage, including the J. Paul Getty Museum capturing the moment with a challenge to recreate your favourite artwork with household objects. Galani and Kidd point to this and to Robot Tours provided by the Hastings Contemporary, "developed as part of a pre-existing research initiative to allow individuals at risk of isolation, including due to disability, to experience the gallery through a remotely controlled robot's camera." The popularity of these during lockdown threw the limitations of physical museum visits for a significant part of the population into sharp contrast. They argue that the pandemic may have permanently changed visitors' approach to materiality and digital storytelling. Covid has given museums the confidence to use the power of hybrid (digital/material) spaces to explore on-line engagement and, importantly, to make "online audiences […] key agents in the production of digitally-mediated material encounters."

With that in mind, we might even test the suitability of a responsive environment for community co-creation. I have shown that it facilitates choice, which is one of the outcomes that Staiff (2014, p. 170) demands of a more modern interpretive approach. But it could also be a way of dealing "with the unauthorized, the non-conforming, the unpredicted, the subversive, the playful, for imagination, creativity and newly-performed responses." The source of those unauthorised, subversive, playful responses could be communities that don't normally feel welcomed by the cultural institution, and by having them presented as natoms within a responsive environment, those communities could be welcomed alongside the visitor that prefers a drier, more authoritative response, with everyone's needs being satisfied. Together, at the same time.

Appendices

Appendix A **Ghosts in the Garden, paper survey**

Ghosts in the Garden survey

Evaluation: Ghosts in the Garden

Researcher name: Matthew Tyler-Jones

Staff/Student number: 25893521

ERGO reference number: 5689

Please initial the box(es) if you agree with the statement(s):

I understand that the purpose of the survey is to discover whether and how the Ghosts in the Garden experience has ☐

I agree to take part in this research project and agree for my data ☐

I understand my participation is voluntary and I may withdraw at any time without my legal rights being affected ☐

Data Protection

I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

Name of participant (print name)……

Signature of participant……..

Date……

Appendix A

Overall, how enjoyable was your visit to Holburne Museum today?

(please tick one box)

Very disappointing ❑ Disappointing ❑ OK ❑ Enjoyable ❑ Very enjoyable ❑

How strongly do you agree with the following statements?

	Strongly Disagree ❑	❑	❑	❑	❑	❑ Strongly agree ❑
Using the *Ghosts in the Garden* box added to the enjoyment of our visit today						
We think the characters we heard were based on historical fact	❑	❑	❑	❑	❑	❑
We think the events we heard about were actual historic events	❑	❑	❑	❑	❑	❑
We think the music we heard was actually played in these gardens in the 1820s	❑	❑	❑	❑	❑	❑
We had freedom to explore the gardens and felt the choices we made changed the story I heard	❑	❑	❑	❑	❑	❑
The story I head had an emotional impact on me.	❑	❑	❑	❑	❑	❑
It was a great story	❑	❑	❑	❑	❑	❑

I/we have visited Sydney Gardens before yes❑ no❑

I am/we are regular visitors yes❑ no❑

Ghosts in the Garden made me visit parts of Sydney Gardens that I hadn't explored before yes❑ no❑

Appendix B *Knight's Peril* survey, sample report

Appendix A

QuickTapSurvey

Welcome, Matthew Logout

Dashboard Surveys Profile Account Upgrade Help

Surveys » Survey Responses » Analytics

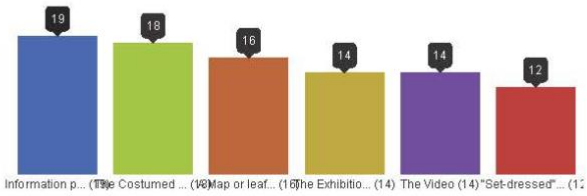
Analytics: GhostsBodiam

1. Overall, how enjoyable was your visit to Bodiam Castle today

Results based on 24 responses to this question

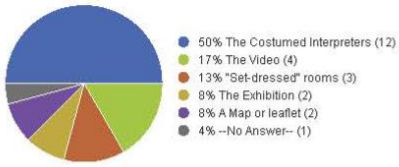
4. What did you use to learn about Bodiam Castle? (Tick all that apply)

Results based on 24 responses to this question



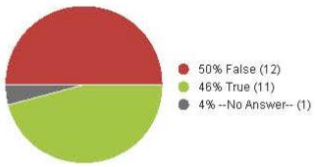
5. Which was your favorite way to learn about the Castle?

Results based on 24 responses to this question



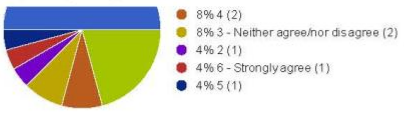
6. Have you bought, or do plan to buy, a souvenir?

Results based on 24 responses to this question



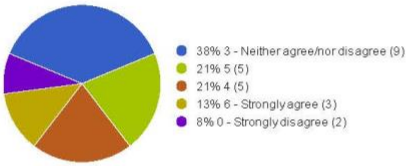
7. I didn't learn very much new today

Results based on 24 responses to this question



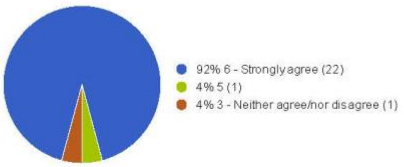
8. My sense of being in Bodiam Castle was stronger than my sense of being in the rest of the world

Results based on 24 responses to this question



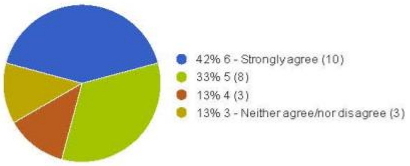
9. Bodiam Castle is an impressive sight

Results based on 24 responses to this question



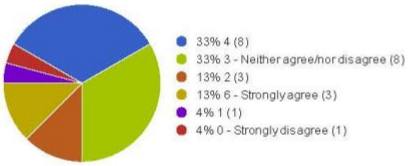
10. I was overwhelmed with the aesthetic/beauty aspect of Bodiam Castle

Results based on 24 responses to this question



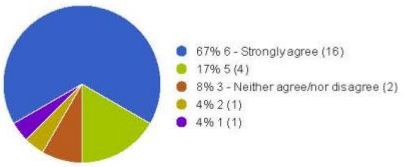
11. The visit had a real emotional impact on me

Results based on 24 responses to this question



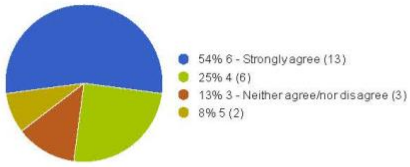
12. I learned about what Bodiam Castle was like in the past

Results based on 24 responses to this question



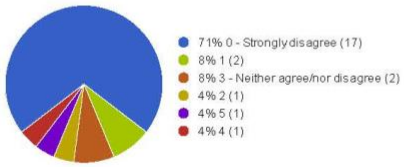
13. It was a great story

Results based on 24 responses to this question



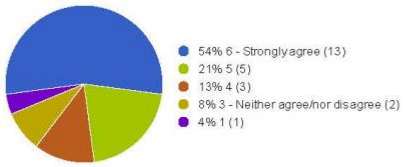
14. During my visit I remained aware of task and chores I have back at home/work

Results based on 24 responses to this question



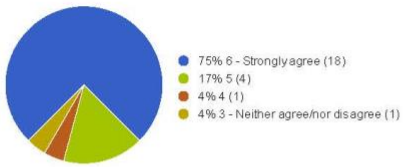
15. I enjoyed talking about Bodiam Castle with the others in my group

Results based on 24 responses to this question



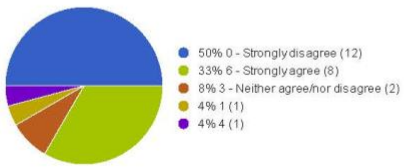
16. Bodiam Castle is beautiful

Results based on 24 responses to this question



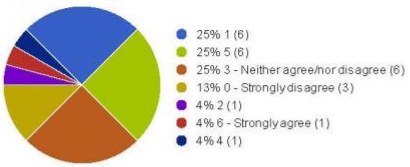
17. I wish I lived here when Bodiam Castle was at its prime

Results based on 24 responses to this question



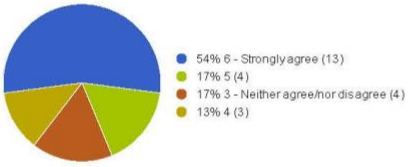
18. What I learned on the visit challenged what I thought I knew about mediaval life

Results based on 24 responses to this question



19. I enjoyed chatting with the staff and volunteers here

Results based on 24 responses to this question



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