Interactive Technologies in the Art Museum

PAM MEECHAM, University of London, UK
ELENA STYLIANOU, University of London, UK

When in June 2013 The Guardian newspaper (UK) asked us to ‘help create the whole picture’ with the GuardianWitness app (‘upload your part of the story faster with 4GEE at witness.guardian.co.uk’) we know the citizen reporter and the eyewitness photographer have been allied to faster, participation and the double page spread (The Guardian, Saturday 06.07.13 pp 2 and 3). Undermining the authorship, authority and arguably the professionalism of the journalist and photographer, the amateur enthusiast, key eye-witness or commentator are crowd-sourced to open up, enhance and create a whole, diverse picture of world events that, in the advertisement at least, speaks of a change in the relationship of passive consumer to traditional authorities such as newspapers.

Another recent example (summer 2013) links the rhetoric of social change to technology and visual culture. However it reveals a different set of coordinates. The Renoir Cinema, Bloomsbury, London (the ultimate homage to auteur in acknowledging the primacy given to the film director’s role in cinema) is now showing films of exhibitions of ‘great’ artists: ‘A global revolution bringing the world’s greatest art exhibitions to a cinema near you!’ (Renoir advertisement). A cinema poster campaign promotes images of paintings as introductions to the following exhibitions Manet: Portraying Life Screenings From the Royal Academy of Arts, London; Munch: Munch 150 From the Munch Museum & National Museum Oslo; and Vermeer: Vermeer and Music from the National Gallery, London. Dates and participating cinemas are available at, ‘great art on screen’ or for those living in Australia www.exhibitionsonscreen. The YouTube trailer proclaims, ‘The world’s greatest art presented exclusively for the big screen: enjoy world class art, history and biography through the works of the great masters’. It is a global first with the short-date screenings offering ‘a unique perspective

DOI:http://dx.doi.org/10.2478/dfl-2014-0006
through a behind the scenes approach’ in a ‘theatrical’ series. However the presentation of the exhibitions through a ‘great master’ and biographical approach presented as ‘the man behind the Scream’ and disseminated by an expert curator, speaks of a dissonance between the revolutionary ambition of access for remote visitors and a dismantling of interpretation away from expert authority. It also reneges on the promise of global revolution in the potential digitally enabled shift away from normative western canons and traditional ways of consuming art through the exhibition format. In a ‘post-canonical’ period with globalization, post-colonialism and ‘contemporary ideas on the instabilities of gender and identity’ (Newall & Pooke 2012) pressing down on the universal survey museum we should pause to question how technology in the museum works: what does it do? In what ways does it value one perspective over another? That it is just another tool is not a defensible position as this article will demonstrate: there are consequences to selection and modes of dissemination.

For instance this summer (2013) the National Art Collections Fund (operating as ‘the Art Fund’ http://arteverywhere.org/artworks) is aiming to ‘put art everywhere’. You can vote for works, selected as a snap shot of Great British Art and they will then be placed in public spaces across Britain on billboards: ‘turning the UK into the world’s largest art gallery’ (art everywhere: a very, very big art show). Not the radical gesture of a Barbara Kruger bill-board from the 1990s but an extension of the National Gallery, London’s earlier 2011 initiative, art everywhere to place parts of its art collection everywhere. The initial selection was made by ‘experts’ (and does contain diverse artists including Queer, Black and Asian women). The public can vote (‘help curate’) from the recently expanded canon to create a top 50. It is a commonplace observation that the selection of artworks is not accomplished by neutral expertise. Tinkering with the canon does not dismantle the relationship between audiences and collections but merely replicates existing power structures. The picture is unresolved as although online collections should promote wider access in practice they often replicate existing patterns as they are made up of traditional collections. This can be demonstrated by the issue cited above so that rather than opening up democratic potential enabled by technology it can also be used to reinforce the Western canon amassed under a different world order.
Farago suggests a ‘Celebration of past scholarship and veneration of primary sources has never been enough in any open society’ (Farago, 2012, p. xxi). Critical thinking about the display and interpretation of artworks and museum artefacts requires recognition of the current situation regarding access, inclusion, interactivity and the externalizing of collections. The recent rescinding of copyright by major museums and through digital media the global ‘inclusion’ of cultures unhindered by the West’s attachment to the original and authentic should herald a re-think about how museums disseminate the curious and wonderful. For our purposes here what does interactivity and immersion mean when related to technology?

However before looking at historic and recent examples of attempts to bring audience and collections in closer proximity we wish to cite an on-going traveling exhibition, that highlights the issues at stake. *Van Gogh Alive-The Exhibition* (Grande Exhibitions of Australia and VisionsCom of France) is a sensory, immersive digital exhibition see (http://grandeexhibitions.com/traveling-exhibitions/van-gogh-alive/). Made up of over 3,000 fragments of artworks accompanied by a classical music score makes no attempt to ‘view’ art in the traditional sense and is closer perhaps to cinema and theatre. According to the organizers it ‘Allows the visitor to be immersed in the artist’s work rather than observe it’ and ‘Broadens the appeal of Van Gogh’s art to audience unrestricted by age or taste’ (grandeexhibitions.com). Crows are animated in wheatfields and trains move across screens, hands mix paint and the audience walk through dwarfed by the fragmented, multiplied and scaled up surrogates of famous paintings. The publicity for the exhibition maintained that the experience of an actual van Gogh could be ‘underwhelming’. The immersive experience was designed to augment the traditional viewing ritual of solitary communion with the ‘real thing’ by scaling up the fragments of digitized oil painting in a holistic way that encompasses the body and its sensory functions.

Surrogates of artworks through reproductions are nothing new but whereas the reproduction usually served as a pedagogic purpose either through slide lecture or the aide memoire postcard the reproductions here are ‘experienced’ as authentic artworks. The landscape of museum visiting has perhaps irrevocably changed as technology is deployed to fragment and
change artworks whose very authenticity and therefore claim to truth relied on their originality and authorship and were perceived as timelessness.

**USER-GENERATED INTERACTIVITY**

In tandem with the dramatic increase in the global availability and scale of digital images is a shift away from the curator to the public as interpreters of the work or disseminators of their own experience of the work. Often more than a blog or twitter, on-line user-generated content is being used by some museums as a ‘legitimate’ way of sourcing the energy and interests of the public. Through the process often called ‘folksonomy’ MacArthur maintains ‘Proponents … argue that allowing users to describe online content in terms that make sense to them, rather than relying solely on organizing principles imposed by others, will make that content more retrievable, useful and meaningful to the audience’ (MacArthur, 2007). MacArthur however questioned: ‘Can Museums Allow Online Users to Become Participants?’ Although only 6 years ago rapid change has transformed some museums with users ushering in authorial reform via social networking media and interactivity blurring boundaries with participation. However, it is also the case, as we will demonstrate, that while technologically enabled brokering has changed the relationship of audiences to museums, collections and curators many have had to relinquish myths and shibboleths that were important to the Enlightenment museum. For instance many recent changes have been enabled by a porous approach to staunchly defended disciplinary boundaries, and creative partnerships and commercial sponsorship abound. The changes outlined above also need to be seen in tandem with the import of academic discourse into the museum’s intellectual and professional evolution to what Hopper-Greenhill termed the ‘post-museum’ (Hooper-Greenhill, 2000).

The last two decades have witnessed a rapid and continuous change in museum identities, purpose, and educative ambitions as they were coerced, through accountability regimes and social change, to re-evaluate and radically change their traditional relationship with audiences unfamiliar with museum visiting. Internationally, technology or ‘new’ media have been conscripted to fill the breach: create digital bridges and create alternative
forms of knowledge. Digital technologies were charged with paving the way to improved audience engagement, dialogic exchange and a participatory ethos. At the same time more comprehensive, pluralistic interpretation of art and artefacts, and the democratization of collections potentially provided access for more diverse, globally networked audiences and the creation of communities of practice. Moreover the technological innovations across museums, archives and libraries opened up collaborations and the possibility of user-generated knowledge only previously accessible to the legitimate scholar. Nevertheless, questions remain and the digital embrace undertaken by museums has not been uniformly welcomed or successful: many unused apps testament to a culture not investing in visitor research before developing interpretive devices. Questions have arisen concerning the purpose and effectiveness of technological applications in the museum environment. Many museum professionals remain sceptical, even hostile, still concerned about issues of authenticity, authority, ownership, and truthfulness of representation. Mediation between ‘the thing itself’ and the viewer is still a vexed issue: particularly in the art gallery (art museum in the USA). It is noteworthy that Asian countries such as Singapore who have a different relationship to technology than some in Europe do not see the import of technology into the museum as problematic. This article aims to highlight the veracity of claims about technology providing both failed and successful examples of applications in museums. Also, it aims to locate the application of newer technologies within museological and educational debate within a larger theoretical framework that concerns issues of interactivity, participation and engagement.

Certainly, it must be acknowledged at the outset that terms such as technology, immersive, interactive, participatory and even visual media are inexact and misleading cultural terms (Mitchell 2007, p. 395-406). Furthermore embedded in such terms and their surrounding rhetoric are naturalised assumptions about the educational and social role of museums; about the inevitability of progress when linked to technology, and about learning and social cohesion brokered through the use of technology. This article proceeds on the basis that many of the terms, definitions and common-sense assumptions about the museum and technology are subject to revision and debate, often with little consensus. What follows contextualises historically
some of the aspirations and ambitions of the museum sector as they return to their core historic role of education (McClellan, 2003).

**A CHANGING MUSEUM: FIRST PROPOSALS FOR ENGAGING AUDIENCES**

In the year 1903 in two different European cities, curators voiced the first attempts to change the physical construction of display in museums for pedagogic purposes. In Manheim, Germany at the *Museums as Places of Popular Culture* conference, ‘Dr. Lichtwark envisioned “a great revolution in the equipment and methods of museums”’ (Griffiths 2003, p. 378). The conference aimed, among other things, to find ways to make the museum a more accessible place for the working classes by using media such as photography and magic lantern slides (Griffiths, 2003). The function of the previously well-preserved, if haphazard *Cabinets of Curiosity* was for the first time challenged because it was felt audience engagement was impaired by their overcrowded character. In 1903 at the Museums Association’s Aberdeen Conference, Dr. Thiis, a Norwegian curator, ‘argued that “nothing is more wearisome to the eye, less advantageous for the individual object, than those long stretches of cases, all to one pattern, covered with black velvet, that are so often seen in museums”’ (cited in Griffiths 2003, p. 378). In 1907 H.C. Bumpus, President of the American Museum of Natural History, also recognised the interfering function of the glass-case to the museum experience and proclaimed the demise of the overcrowded museum display.

The historic conferences cited above also expressed concerns that artefacts disconnected from their original context, by then commonplace curatorial practice, were at a disadvantage; prescient of the postcolonial and postmodern theories that have dominated contemporary museum debates in the late 20th and early 21st century (Bennett, 1995; Thomas, 2009). Thus, proposals for more direct interaction with objects on displays were voiced with the intention of popularising exhibits and gaining a better understanding of the isolated, deracinated object. In 1901, Kate Hall curator of the Whitechapel Gallery London ‘stated that when school groups visited the tiny museum, the objects they wanted to study “should whenever possible, be taken out of their cases”’ (as cited in Griffiths, 1999). In the early 20th century such philosophies were driven by the belief that hands-on activities improved learning and increased visitors’ enthusiasm for museums (Black 2007;
Reeve, Lang and Woolard 2008). In an earlier article in a 1903 Museums Journal entitled ‘How to Make Small Natural History Museums Interesting’, Dr. Hecht responded to the same challenge of the isolated object, by recommending the use of stopping points in galleries, ‘which he defined as displays relating to the primary exhibit but “chosen in order to arouse, from time to time, the interest of the public, to lead their mind from the view of a single animal to larger ideas, to general conception”’ (cited in Griffiths 2003: 378). Even though Hall and Hecht’s ideas are more than a hundred years old, they reflect contemporary museums’ philosophies about the display of objects as well as pedagogic practices. In summary, these early trends in exhibition design shifted away from overcrowded galleries, to forego the glass case, to reach out to wider audiences and to contextualize the object on display.

A pioneer of American community museums, John Cotton Dana (1856–1929) whose regard for culture was derived from Thorstein Veblen (1857–1929), believed that context was more important than aesthetics in the design of museum displays. Dana founded the ground-breaking Newark Museum in 1909 and published his ideas in The New Museum in 1917. He was particularly concerned that American museums were following European precedents, where the pedagogic foundation of the museum was being eroded by the cult of the curator compounded by the shift away from education to collecting, conservation and connoisseurship. By indulging the requirements of the great and good, the museum rendered collections irrelevant to the lives of working people. Approaches to viewing art also fell under Dana’s scrutiny. He dismissed as cant the notion that merely gazing at great objects through aestheticism alone was enough to improve and elevate the viewer. For him, engagement, education and full public access were crucial to the democratization of culture, and therefore should be a museum’s founding principle. An early advocate of what is once again being legislated as good museum practice, Dana also sought ways to increase cooperation between schools, libraries and museums. Deploiring snobbery, ‘Dana assert[ed] that beauty bears no relation to age, rarity, or price. To encourage recognition and enjoyment of beauty in commonplace things, he once exhibited well-designed pottery that he had procured from a five-and ten-cent store, proudly announcing that not a single piece had cost more than twenty-five cents’ (Ford 2006, p. 2).
Dana’s approach bore comparison with a department store ethos, approaching visitors as ‘customers’ in a non-elitist environment which embraced the building, the collection and approaches to education, arguing that ‘A great department store, easily reached, open at all hours, is more like a good museum of art than any of the museums we have yet established’ (Hadley nd: 68). The idea of the 24-hour museum that has a department store culture is currently being widely promoted, especially during the last few decades, through the virtual museum and the increasingly technologically enabled commodification of once exclusive collections. Dana’s mantra of ‘Learn what aid the community needs … and fit the museum to those needs’ (Weil, 2002, p. 190) was in sharp contrast to the rapidly developing national museums of the early 20th century. Aligning himself with personal freedom and cultural pluralism, Dana was dissatisfied with curator’s prioritising of collection over audience. He instead, ‘chided both schools and museums for telling people what they ought to appreciate, maintaining that by doing so they encouraged hypocrisy – the greatest impediment to the genuine sensibility’ (Ford 2006, p. 2). Dana is an important touchstone for the 21st century, although it is doubtful that he could have envisaged the way technology would re-conceptualised the museum from penitentiary for artefacts to a site for health and well-being for all (‘Museum participation should be a measure of well-being’ (2011) Museum Association to Office of National Statistics).

It could be argued that the quest to make collections accessible beyond the traditional graduate-educated audience (see Bourdieu, Darbel, and Schapper’s surveys undertaken during the 1970s and 80s on the relationship between museum audiences and educational attainment1) is potentially possible within the utopian rhetoric of technological progress. The early 20th century ambitions sketched above prefigure in many ways the use of interactive digital technologies in today’s museums (Griffiths, 1999; 2003). However, in 1998 at the outset of new media’s relationship with the museum, Selma Thomas argued that to use media well in a museum context ‘we have to define, question and evaluate our approaches to and goals for education and interpretation’ (Thomas & Mintz, 1998, p. viii).

Museums, cemeteries! Truly identical in their sinister juxtaposition of bodies that do not know each other. Public dormitories where you sleep side by side forever with beings you hate or do not know. Reciprocal ferocity of the painters and sculptors who murder each other in the same museum with blows of line and color. To make a visit once a year, as one goes to see the graves of our dead once a year, that we could allow! We can even imagine placing flowers once a year at the feet of the Gioconda! But to take our sadness, our fragile courage and our anxiety to the museum every day, that we cannot admit! Do you want to poison yourselves? Do you want to rot?
(Marinetti, 1909)

In 1909 F.T. Marinetti’s ‘Futurist Manifesto’ declared the obvious; museums were no longer able to respond to the fast changing nature of society. The increasing demand for spectacle in the 20th century, the fast-paced life and fascination with machines, speed and industry had inaugurated a new era. The cultural evolution that sought to modernise life had a great impact on institutions such as museums that previously defined knowledge, tradition and cultural values. Self-reflexivity has been a hallmark of the museum’s historic success and in the 20th century the monumental, universal museum that spoke for a unitary public had to adapt in the light of seismic social change.

The use of newer technologies in museums first began with the aspiration of changing their character to adapt to newer sensibilities as mentioned above. In 1969, its centenary year, the American Museum of Natural History in New York curated a blockbuster exhibition, entitled Can Man Survive? It cost a half-million dollars, a respectable amount for the time, and lasted two years, a long time period for a temporary exhibit. Technology, environmentalism and postmodernism were issues addressed by the show, which aimed to challenge visitors to rethink the sustainability of their lives (Ducao & Koen, 2007-2009). The show was divided into different trends deemed to be threatening the environment: large cars, littering, noise pollution, water contamination, industrialisation, cruelty to animals, overpopulation. The corridors of the galleries were intentionally narrower than usual to create...
emotional and physical discomfort to the visitor. Aiming to increase the exhibition’s impact, ‘A mix of slides, film and video were projected onto randomly slanted walls already full of text, texture and graphics’ (Ducao & Koen, 2007-2009) a process of bodily interaction that predates by over 40 years Van Gogh Alive-The Exhibition. In Can Man Survive? technologies of representation and interpretation, both ‘old’ and ‘new’ were utilized, radically so as portable video recorders were introduced into the market only two years earlier. Ducao and Koen (2007-2009) rightly point out that while the artist Nam June Paik was filming the Pope in downtown New York, a more institutional type of ‘video art’ was adopted for purposes of interpretation and participation in this exhibit.

Despite its popularity Can Man Survive? received strong critical responses reflecting what would later become a considerable gap between audience and curators’ approaches to technological applications and which only recently has been ameliorated through greater technological embeddedness in museums. As early as the 1960s, the first concerns were related to destabilizing the very foundation of the museum’s authoritative character. Within material culture collections, technological interventions were perceived as potential threats that would undermine the art and artefact’s authenticity. There was also a pressing question relevant to the type of experience visitors would have when technologies became part of the displays. In what ways could museums enhance visitors’ engagement and learning? They were and remain difficult questions to answer, although the subject of recent research, indicating that the application of technology in museums should be neither taken for granted nor remain unchallenged.

In his ‘Medium is the Message’ (1964) the Canadian Marshall McLuhan (1911-1980) foresaw the huge impact of new technologies on ways of life, communication and learning and identified the difficulty of approaching new media. He suggested ‘We approach the new with the psychological conditioning and sensory responses to the old’ (McLuhan, 1964). McLuhan’s fifty year old claim of witnessing a transitional period, during which

2. This relative relationship between the uses of technology by museums and artists is important. Without necessarily suggesting here that one is better than the other in the ways that they adopt and use new technologies, such practices often remain parallel even though collaborations might prove useful.
attempts to respond to social changes using the tools of the past seemed doomed to failure, are still relevant. Often, the smart new devices used by museums aiming to potentially stimulate visitors’ interest and engagement with collections fail to do anything more than imitate older forms of interpretation. (It is still a moot point that the sketchbook and pencil can accomplish more in greater scale, texture and communicability than more recent technology). Pod-casting and mobile phone tours are replacing the traditional audio guides, such as the web-based iguides piloted at the Dulwich Picture Gallery, London (Beazley, 2007), PDAs replaced information kiosks, which in turn aimed to replace the exhibition catalogues and text panels. The significant difference between early guides and navigational support, such as paper based instructions to follow ‘the director’s favorites’ or ‘highlights from the collection’, is the greater choice apparently afforded by the technology. In practice however the guides, paper-based or audio, usually replicate existing patterns of interpretation with the greatest benefit being audio rather than written instruction with many galleries using celebrities to voiceover. The use of guides for resolving the issue of interpretation, as much as the degree to which this influences or improves interactivity in the museum, are both important challenges for technological applications, as they are notions that in themselves require further exploration and research.

TECHNOLOGY AND INTERPRETATION: TIED TO CONTEXT

It is with the burning issue of interpretation that technology in and out of the museum has a legitimate place (rather than technology merely searching for a job to do). As early as 1904 the curator Dr Ant Fritsch in an essay titled The Museum Question suggested the use of phonograph recordings in exhibition installations to provide contextual information for objects displayed (Griffiths 1999; 2003). A method considered radical for its time, it has been a primary consideration for new media technologies used for museum audio guides, downloadable iTunes recordings of audio guides, information kiosks, and other portable interpretive devices such as the ubiquitous smart phone. The last 10 or so years have seen an increasing debate around the written text panel placed next to an exhibit. Under access and inclusion agendas the explanatory text panel grew ever longer. However, under more recent budgetary constrains we have seen a move to minimal
or even no supporting text: a return in art galleries to aesthetic reading of artworks. However in some galleries technology has been used to replace panels offering pluralistic interpretation user-generated ‘tagging’ through the use of smart-ticketing.

It is worth noting how quickly technology has been adopted by museums. In 2005 the Indianapolis Museum of Art (IMA) launched the first hand-held device for their museum collections. This was a user-friendly PDA, named ArtXplore, aiming to provide visitors with ‘greater freedom to customize their museum experience’ (Indianan University, 2005). It provided ‘multiple layers of audio and visual content, such as graphics, animations, video and panoramas, on 16 objects from the IMA’s American collection. It also allow[ed] visitors to review their experiences and convey comments to the IMA’ (Indianan University, 2005). In the same year, the Getty Museum in Los Angeles was lending visitors hand-held computers that contained information about the entire collection, but specifically about the French painter Jacques-Louis David for the purposes of the exhibition ‘Jacques-Louis David: Empire to Exile’. Getty’s executive director for digital policy, Kenneth Hamma, suggested that this was a reaction to the static nature of computer-based displays in the galleries up to that date (Hafner, 2004). Since these first uses of such devices in museums, their visibility has increased. Few international museums are without social networking media and virtual spaces for visitor interaction. In addition, companies such as Apple or Google, acknowledging the shift from the confined museum to a space of open interaction and interpretation by users, launched applications such as Art Authority for ipad Patrick J observing ‘… ArtAuthority takes away the sore feet and time constraints. As its App Store description declares, it is an amazing museum right at your fingertips…’(Review for ipad Insight May 21, 2010) It has a personalized approach to interpretation through contextual information and a close-up gaze at the digitized artwork. GoogleArt project launched in 2011 uses Street View technology familiar through google earth. The project was extended in 2012 with virtual access to 46 international art museums and galleries including The Frick Collection NYC whose collection does not travel, Uffizi Florence, The State Hermitage Museum, St Petersburg, Rijksmuseum Amsterdam, Museum of Islamic Art, Doha. Users can zoom in and study details of paintings in high
resolution. They can also navigate around the museum and see the context within which artworks are viewed. The second generation platform using google+ will be multilingual and has a video and audio content, quizzes and educational materials that allows a level of interaction with numerous collections, slides shows to be made and research done (collections can be cross-referenced). This level of DIY engagement and interaction is unprecedented previously for all but curators with extensive travel budgets. The aesthetic objections to looking at inferior surrogates has largely been technologically overcome.

Historically, especially in the beginning of the early 20th century, providing contextual information to the objects on display has been one of the main concerns of museums. Even today, establishing accuracy and truthfulness about an object bears heavily on museums that often turn to historical information. Freeing an object from its historical and cultural context immediately makes it susceptible to unsubstantiated generalizations or interpretations, often far removed from the object’s original identity/purpose. However, personalization of collections and multiple visitor interpretations are sought after by the constructivist museum seeking to diversify audiences (Hein 2003). In addition, museums recently seem to move away from fact and historical record to a more loosely related approach to interpretation, allowing narrative, myth and fiction into museum displays. For instance, at the Chelmsford Museum, the display of industrial machinery has shifted from factual and technical information to SCOT (social construction of technology). The displays of old technology, such as winnowing machines (part of a miller’s equipment developed in the 19th century), are framed within social history, adding narratives to the previous scientific explanation. Traditional top down histories that privileged the great, good and intellectual, are here replaced by a bottom up approach that emphasizes social and economic processes: part of contemporary movement for social change. The shift away from factual, empirical data to more nuanced multi-vocal histories has gained ground in museums and galleries for three specific reasons: first, a reflection of post-colonial and competing social voices; second, the rise of constructivist approaches in education departments and third, accountability and instrumentalism that have called publicly funded museums to account within the rhetoric of MLA’s framework.
Inspiring Learning for All and widening participation. A more recent example from the Museum of London confirms that the shift to narrative from historical truth seems to be gaining ground as new approaches to museum interpretation that include fiction are sought out. In the *Pleasure Gardens* (2010-2013), a three-dimensional immersive environment is created in the newly renovated galleries to provide visitors with a re-envisioning of the experience of the Vauxhall Gardens previously only imagined through Canaletto’s painting *Vauxhall Garden: the Grand Walk* (1751). In the gallery space, three-dimensional figures, dressed in historic costumes seem to stroll casually, against a theatrical backdrop of painted gardens. At closer inspection, each figure wears hats, created by hat designer Philip Tracey, anachronistic for the time of the stroll, unusual for even a contemporary onlooker. The subtle blurring of truth and fiction seems natural in the museum setting, simultaneously alluding to a necessary acknowledgement that the two, truth and fiction as constructions, have always been interwoven in the stories that museums are shaped to tell. The *Pleasure Gardens* also uses film in which actors exchange their personal experiences in the gardens. A fictionalized account that entertains in a way that Canaletto will not. *Pleasure Gardens* also stands as a useful example of a historically recorded tendency of museums to establish immersive spaces. These are considered to be useful in increasing visitor participation and interaction; the latter a term initially coined with technological application but which needs further analysis and in-depth examination.

Historically the 19th century cyclorama and Kaiser Panorama Theatre (3D slides of postcard shown with incense wafting for added sensory enjoyment) also attempted illusion to bring the ‘exotic location’ to all. In New York, The Metropolitan Museum of Art displays John Vanderlyn’s (1799) Panoramic view of the Palace and Gardens of Versailles in a purpose built circular gallery. It is a walk through immersive experience in a gallery 12 ft by 165 ft (360cm x 49m). Again it bears some comparison with the *Van Gogh Alive-The Exhibition* and *Pleasure Gardens* all attempt to provide audiences with a holistic, sensory experience.

**INTERACTIVITY: AN OVERUSED TERM**

Interactivity can be separated into two distinct, although not entirely sepa-
rate, activities: interactivity as active through bodily activity and interactivity through imagination and memory. Albeit the enthusiasm with interactivity as the means of making effective displays and/or learning experiences, technological mediation in the museum is generally marked by a tendency to work with the former understanding of interactivity at the expense of the latter. The underlying assumption that interactivity can affect change in participants and create a new kind of spectatorship is criticized by Burnett who points out that any kind of measurement or validation made for claims remain elusive, insisting that ‘Interaction is about the interplay between fiction, the reality of the moment, and projection’ (Burnett’s italics) (Burnett, 2007, p. 313). Burnett gives primacy to the role of the imagination in interactivity and maintains therefore that it is not the technology that enables interactivity but the activity itself. This important distinction is crucial in establishing what happens when one looks at material culture. Part of the problem lies in the familiar representation of old technologies or old media, such as the diorama or still-photograph, as static and the activity of merely looking as passive. Interaction, projection, immersion, and identification are the key terms that Burnett uses to understand the ways in which interactivity is experienced by the participant.

A further difficulty lies in new media requiring a history that is comparable to the old art history (Grau 2007, p. 1-13). If new media is allowed to function within the art academy on its own terms rather than be seen as inauthentic it will gain greater credibility. There is a need to recognise that a new vocabulary, ‘a typology of interactive processes’ (Burnett 2007, p. 314) needs to be developed to articulate participation and multi-faceted reception when using digital media. In particular we need to understand further how emotional and intellectual responses are evoked in the user through both kinds of interactivity. This is of particular importance for education in trying to understand responses to multi-media devices when they are used to mediate between artwork and visitor/audience. This is not to claim that there is a difference between the authentic and the inauthentic but to understand that mediation is not necessarily an engagement in evaluation.

Part of the issue is what do inter-actives do? Why have they in general just replicated existing patterns of interpretation already used by museums and
galleries becoming merely mobile text panels or traditional tools similar to the paper gallery-plan. There is a comparison to be drawn from the development of early cinema that developed along two paths: one to so-called realism, the other to radical experimentation that used the medium in unexpected, innovative ways. Interactives can merely be conventional reworking of existing pedagogic and traditional art historical methodologies or historical narratives with the myth of personal control. If imaginary projection has always been one of the ways of identifying with screen-based experiences it is also the case that imaginary projection unmediated by technology or text-panel has been at the core of looking through pathetic fallacy. The term pathetic fallacy was coined by John Ruskin (1856) *Modern Painters* to ‘signify any description of inanimate natural objects, that ascribe to them human capacities, sensations and emotions’. Anthropomorphic tendencies are important if artworks (normally inanimate objects) are to function as capable of creating sensations and emotions in the viewer. *Imagination* then enables a suspension of belief across time and space allowing the viewer to empathise with landscape and images across cultures and time.

However, despite the tendency to dismiss past media as static and passive there is also a tendency to believe that digital technologies encourage in audiences an expectation of greater control and participatory activity. The humble sketchbook and pencil, a staple of school and college visits can be regarded as a participatory tools: the sketch-book provides before and after investigation can be passed on, annotated, posted and returned for discussion and scholarship.

Interactivity in the museum also chimes with the history of participation art. Since at least Dada and Surrealism of the early 20th century, artists have addressed the possibility of interacting with artworks, not only allowing visitors to touch and handle their work but also inviting them to do so, accepting the viewer as an integral, necessary aspect of the work. Such artists were the first to practically address Umberto Eco’s notion of ‘openness’ in art and Michel Foucault and Ronald Barthes’ notion of the ’death of the author’. The artist liberated the work from his/her authoritative presence and allowed the visitor to create meaning for themselves. The work of art could
therefore mean a number of different things and polysemic interpretations were directed by what the viewer brought to the work. Long before the relational aesthetics of the 21st century, John Berger spoke of ‘ways of seeing’ and many artists created works that invited the viewer to become part of the artwork itself (Berger 1972). Many museums were slow to embrace the idea of audience’s changing once unitary and authoritative meaning but such displays are now commonplace in less traditional museums. In tandem with such changes about where meaning resides has been the growth of constructivist learning and teaching methods now commonplace (if not uncontested) in many museum learning departments (Hein, Hooper-Greenhill, Falk and Dierking). New digital technologies offer the promise of increased participation and thus of improved learning.

This expectation of audience participation is part of a greater awareness of the role of the spectator in interpreting artworks or artefacts and witnessed in Nicholas Bourriaud’s influential (2002) *Relational Aesthetics* a touchstone for art students this century. Marking another seismic shift in gallery culture, under Bourriaud’s gaze artworks are judged upon the inter-human relations which they represent or produce, rejecting traditional art history (in particular the formalism of the 1950s and 60s). In 2002 he curated *Touch, Relational Art from 1990s to Now* for San Francisco Art Institute. Importantly he is most interested in exploring the interactive works that often invest in the worlds opened up by the internet. Although the imaginary placement of the self in to pictures can be done without recourse to technology via the imagination, the possibilities for innovative interpretation can be enabled through mobile hand-held devices. Decreasing curatorial control can allow for audience entrance-narratives to override the now outdated search for a single authoritative voice, guiding the one meaning of the picture, or the fall back position of reading artwork through the artist’s biography. Canonical art history can be narrow and often elitist and dependent on arbitrary taste rather than any objective criteria. New apps offering a range of competing sometimes contradictory voices have developed in tandem with the rise of the social art history that foreswore artists’ intentions or aesthetics as the dominate way of reading an artwork to privilege the reader’s voice/subject position or entrance narrative. Ushering in a period when relative autonomy replaced any ahistoric3 notion that art existed outside of culture and was
therefore immune from ideological imperatives, the social art history had a profound if belated effect on museum education. Formalism was called to account by the so-called New Art Histories of the mid- to late 20th century and while once the galleries preferred position (it requiring nothing of its audience but ‘sensibility’) the social art history took account of the viewers’ subject position ousting the universal subject and questioning the basis of the universal survey museum. The move to digital technologies has the potential to enable audiences to fracture into smaller communities of practice. Digital media has the possibility of beginning the process of differentiation between audiences and bringing an end to the homogenising tendencies of educational strategies that delivered to a receptive unitary audience. At ‘the heart of interactivity, which is more about navigating through the landscape of available technologies…interaction is about communication processes, which link meanings together in ways that are not predictable’ (Burnett 2007: 333). If this is the case the inter-actives in many museums and galleries still have some way to go to realise their potential.

In McLuhan’s ‘Understanding Media’ (1964) the metaphor of cool and hot media were used to define the degree of interactivity. McLuhan suggested that media such as the radio are hot because they minimise the degree of interaction between audience and medium and they leave little space for participation, whereas new interactive media, such as the computer, are cool because they are high in participation. Certainly, such a metaphor was quite fascinating in its time but today distinct categorisations between ‘old’ and ‘new’ media are less secure. Newness does not directly establish something as ‘cool’ or ‘better’, but rather, it is the ways media is used that defines the degree of interactivity. Museums often unquestioning use new media misled by the assumption that interactivity is linked to their manufacturing date. In Robert Markley’s edited Virtual Reality and their Discontents (1996) the authors suggest that there is need for scepticism concerning the notion that a new form can dispatch and replace an older one.

Certainly, attempts have been made to combine the ‘old’ and the ‘new’ in

3. The use of ahistoric formalism promoted by Kant (18th century) Fry and Bell in Edwardian England and Clement Greenberg in mid-20th century America dominated gallery interpretation until the 1980s.
order to stimulate interest and visitors’ participation. At the Museum of the Rockies in Bozeman, Montana, a computer-based exhibit allows visitors to enter information to find the age of a rock and even though quite popular, an equally engaging material-based exhibit nearby, a set of drawers that visitors can open to reveal various strata and fossils in a rock (Hafner, 2004) is also popular. The Wellcome Collection in London uses a similar ‘seek and find’ approach with artefacts to encourage participation.

At the National Archives in Washington the Public Vaults is a good example of the way in which new computer technology is integrated with the old archival documents, some of them impossible to access physically because of their fragility. Displaying at any given time 1,100 record-originals or facsimiles of documents, photographs, maps, audio and video clips and drawings, the archive allows the visitor to see material otherwise inaccessible. Even though the degree of interactivity in this case is again minimised to clicking buttons and navigating through a pre-determined structure of information and documents it does suit the context in which it is displayed for it replicates the physical act of navigating archives. The Darwin Centre (Natural History Museum, London) also uses facsimiles and archive material effectively. Fragile pressed plant book (to scale) can be digitally opened and the use of hotspots allows deeper knowledge of the plants to be revealed.

However, there is currently little empirical evidence to demonstrate that interactive displays in museums have long-lasting effects or whether such displays promote better learning in museums than older forms of engagement and traditional interpretation methods (Evans & Sterry, 1999). Without doubt interactive exhibits are popular with visitors, especially young ones, and they do increase the time people spend in the galleries. But, this might simply be the result of technology’s attractive character and its potential to sustain attention without this necessarily relating to visitors’ attention with exhibits (Screven, 1990; Evans & Sterry, 1999). Griffiths suggests that ‘we know little about how or what types of information visitors retain from media installation in galleries’ and this was voiced ‘as long ago as 1969 in the conclusion of one of the earliest studies of audiovisual media conducted in the museum at the Fort Parker historic Site in Texas’ (Griffiths 2008, p. 275). Audiovisual media used without testing their ‘effectiveness’
both in the immediate museum experience and in the long-term is a problem that many audience studies still face. Part of the problem in terms of mediating between forms using multimedia devices is that they are largely written text based while many of the objects at the centre of the interpretation are mono-modal (i.e. painting). The act of interpretation is therefore though another medium (usually speech, word text or music) sometimes confounding experiential, bodily, haptic and tactile modes of learning.

Interactivity, in theory, became an approach that favored the subject who interprets information provided and moved the museum away from the contemplative approach toward the object. Integral to the new interpretive devices, museum engagement focused on the multiplicity of perspectives and the celebration of their diversity. Art and artefacts have struggled to remain on the pedestal of objectivity set up during the museum’s crucible in the 18th century Enlightenment, and are now subject and object becoming mediators of multiple histories rather than documents of a history fixed in facts. The distance that museums established between their displays and audiences during the earlier years of their creation is disappearing with attempts to bring audience and collections into closer, more dialectic/dialogic relationships. Nick Serota’s manifesto for the Museum of the 21st century suggests it is worth considering the ‘extent [to which] we remain authors, and in what sense… we [museums] become publishers providing a platform for international conversations?’ Burnett would argue that authorship needs a radical rethink as,

The ubiquity of digital tools and computers means that the role of imagination and projection as fundamental attributes of any cultural experience will be in the hands of creators and the audiences. This more than anything else may finally broaden and deepen the interactive potential of all audiences and lead to radical changes in the cultural understanding of authorship. (Burnett 2007, p. 333-334)

**IMMERSIVE ENVIRONMENTS AND EDUTAINMENT**

Despite research and continuous attempts to monitor technological use in museums, and an increased acceptance of new media technologies by more museums today, unresolved debate remains. In part it is a philosophical
issue with museum staff and core historic audiences concerned about the so-called ‘Disneyfication’ of museums and dumbing-down. Applied technologies often appear to blur the line between education and entertainment in the museum galleries. As early as the turn of the 20th century curators were ambivalent about the thrill and excitement caused by some exhibitions. Even the diorama ran the gauntlet of charges of ‘too easy’ and ‘too accessible’ to be pedagogically challenging enough. In 1892, Morus Jesup, president of the American Museum of Natural History in New York spoke of ‘rational amusement in the form of respectable recreational pursuits’ (cited in Ducao and Koen 2007-2009). Exemplary are the so-called freak shows and wax works popular in the United States between the 1840s to the 1970s. Since the beginning of such shows, debates and oppositions to their entertaining potential was recorded by the response of more conservative curators who thought this marked the decline of the authentic museum. In 1905 in *Museums Journal* Frank Woolnough maintained:

…[t]he old curiosity shop days of the museum are over. The misguided lamb with two heads, and the pig with two tails, are relegated to a back closet, if they have not already found a resting place in the sphere of the dust-bin. There is so much that is beautiful in nature to preserve that we have neither time, space, not inclination to perpetuate freaks and errors. (cited in Griffiths, 1999)

Removing curiosity and wonder, the increasingly regulated and puritanical museum moved towards taste and conservative conformity with the desire to exhibit ‘beauty’ to elevate the feckless masses. At the same time, it can be argued presenting ‘freaks’ also became unacceptable within the postmodern paradigm. In effect, technologies proved to be a safe solution for maintaining entertainment in the museum while at the same time responding to younger audiences, or a generation of youngsters born digital.

In her 2008 book ‘Shivers Down Your Spine: Cinema, Museums and the Immersive View’ Alison Griffiths points out that the effects of wonder and entertainment were best achieved historically through immersive environments in museum exhibits. The first diorama, the panorama and today’s digital virtual reality environments engage the viewer in an embodied expe-
perience that stimulates imagination through the illusion of being there; in a constructed time-space. On the one hand Hayles, describing the experience of a virtual three-dimensional environment argues that, ‘the boundaries of self are defined less by the skin than by the feedback loops connecting body and simulation in techno-bio-integrated circuit’ (as cited in Robins 1995: 138). Further, Michael Benedikt argue that ‘cyberspace can be seen as an extension, some might say an inevitable extension, of our age-old capacity and need to dwell in fiction, to dwell empowered or enlightened on other, mythic planes’ (as cited in Robins 1995, p. 139). Grau (2003) agrees that the sense of being in the picture has always been part of the way we respond to images. Since their digitally developed genesis, virtual reality environments promised to deliver the user of such technologies from the constraints and defeats of physicality and everyday life. Such uncensored and individual experiences are associated with imagination and thus, one could argue that the fascination with the virtual is the result of a possibility to enact fantasies similarly to dreams.

Virtual reality technologies have been received with immense enthusiasm for their inherent participatory nature. Certainly, as mentioned previously, interaction and engagement in participation is not always clearly defined or assessed and the effects of such applications remain unknown. In the most part, even though visitors tend to engage with virtual reality installations, museums are still skeptical about their threatening potential of taking away from the authentic experience with museum objects. In 1986, when interactivity and technology were the buzzwords, curators darkly cautioned ‘every exhibit topic does not lend itself to intensive interaction. Activity that is purely for entertainment may be fine in an amusement part, but a museum activity should be a goal in museum exhibits only if the interaction has a clear purpose’ (Griffiths 2008, p. 274).

But if the shift to more open, entertaining access enabled by technology is lauded as the key to the future it is also the case that ‘the thing itself’, the material base of the museum, the stuff of the collection is often characterised as in need of no technological or indeed any other mediation. In the same conversation at the LSE, MacGregor reminded his audience that ‘The dialogue with the single thing can still change lives’ .... (MacGregor, 2009).
The issue of technological mediation or interventions between the audience and artwork/artefact in the gallery itself is historically problematic with a clear distinction between the museum artefact and the gallery fine artwork: the latter often characterised as needing no intervention. Even the services of word-based, wall-mounted text panels are a disputed intervention.

Technological mediation inside the historic gallery and traditional museum, beyond navigational tools such audio wands, has, with several notable exceptions outlined below, been kept to a minimum. The newer museums, or cultural centres that do not have a particularly long historic legacy have largely embraced technology throughout the institution. In particular the British Music Experience within the O2 building in London is almost wholly interactive, the rest of the collection being music memorabilia. The inter-actives vary, from timelines to digital record collections which can be virtually scrolled through, to a fully working ‘studio’ with instruments that the visitor can play and record to later listen to at home. The whole can be accessed via interactive tickets. Atypically science-centres too have a long history of working with technology in the display areas. In Whitehall, The Cabinet War Rooms and Churchill Museum Home (complete with on-line virtual tour) has exemplary inter-actives and integrated technology that may reflect the wide use of archive materials and the lack of precious and aesthetic objects in the collection.

Evaluating Technology: Revealing Art with New Technology

Museums have recently sought out alternative ways for interpretation that move beyond re-creating orthodox text-based and data dump approaches that marked the first wave of digital devices. The most interesting and successful approaches move beyond written, explanatory language to engage the viewer visually. The exhibition Leonardo da Vinci: Experience, Experiment and Design, of Leonardo da Vinci’s drawings at the Victoria and Albert Museum in London in 2006, curated by Martin Kemp stands as a celebration of the ways in which technology can modestly cherish the art it attempts to interpret. High above the still, often fragile, and sometimes faded, da Vinci’s drawings, computer animations offered interpretations to the mesmerised viewer, of Leonardo’s working processes. The screens became windows on Leonardo’s mind bringing to life the strongest mechanism ever; that of the
human mind. Adrian Searle of The Guardian describes his own experience:

*Above the displays of drawings, computer animations lend Leonardo’s sketches the movement they always implied. Geometries turn and mutate, muscles flex, a Renaissance tank start firing on all cylinders. I come out reeling – but compared with Leonardo, feeling as useless as one of his perpetual motion machines.* (Searle, 2006)

The same year, Tate Britain used technology to give access through x-ray technology to the original sketches of Constable’s six-foot canvases at the exhibition *Constable: the Great Landscapes*. In the exhibition the six-footers as they are called were displayed for the first time with the original preliminary full-scale sketches so that visitors could see the changes Constable made before arriving at the final work. The interactive displays placed at the end of the exhibition were designed to further the curator’s ambitions to reveal Constable’s working methods. The design brief for the installation asked for an interactive capable of engaging visitors, supporting curatorial themes, complementing the space and surviving months of heavy usage. Further, the ‘interactive interpretation’ should allow visitors to see the changes the artist made between the sketches and the final picture and to understand the ‘physical techniques used to create and scale the work’ (Design Brief). Crucially for the gallery at least ‘Any developments would have to preserve the integrity and aesthetics of the pictures themselves, to enhance rather than undermine the objects’ (vom Lehn, Hindmarsh, Luff & Heath 2007, p. 1486).

Two installations were created, a gestural interface and a touch-screen panel, both connected to large projection screens showing Salisbury Cathedral from the Meadows (1831) and *A View of Stour Near Dedham* (1822). The installations were designed by All of US, London. Research was conducted by King’s College, London using discrete video-recording and field observations. Installation one was an x-ray examination of life-size (six foot) projection of Constable’s (1831) sketch of *Salisbury Cathedral from the Meadows*. The projection was video-mixed with the x-ray of the painting to analyse the artist’s initial images and over-painted changes. It was connected to a
conventional Pentium PC and basic black and white CCTV camera located underneath the projection screen. As the camera captured people’s movements in front of the projection bespoke software translated their movements into changes in the picture. The curator hoped the x-ray examination would allow ‘for exciting and intuitive exploration of the changes that Constable made in the sketch’ (Design Brief). In installation two a ‘Drawing activity’ aimed to reveal how ‘the artist would lay a grid of threads across his sketches for the purpose of accurately transferring the image to the finished painting’ (Design Brief). The installation consisted of a large projection of Constable’s (1822) painting *A View on the Stour Near Dedham* and a table showing a pencil sketch and a slightly larger oil painting of the same scene. The oil painting was placed under a touch-sensitive glass-panel. The sketch and oil painting were the basis for the six-foot final work. By touching various sections of the glass-panel, parts of the painting become visible on the projection screen in front, software on a PC translated the user’s actions on the glass-panel into images on the projection.

The research for this project is telling. The research team saw sensor-based technology as an unobtrusive way forward in relation to technology’s perceived disruption of the ‘real thing’. But they suggest following their research that there was a need to understand among other things,

- How people can be more smoothly introduced to the use of installations and their part within the exhibition?
- How the system’s responses can be designed to more readily reflect the different forms of participation arising in its locale?
- How systems can be designed to establish clearer links between interactives and the original artworks?

The last point grew out of research that demonstrated that the drawing activity and the x-ray examination that are displayed in a room remote from the original artwork did not result in increased visitor engagement: ‘Only very few visitors returned from the installation into the main exhibition

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to view Constable’s paintings. It would be worth considering how to better support connections between the two’ (vom Lehn, Hindmarsh, Luff and Heath 2006: 1493). This last issue is the most important for museums. What is needed is technology that will make people pay attention to the artwork or exhibition. It is also noteworthy that the vom Lehn, Hindmarsh, Luff and Heath research is typical of research around museums and technology that has tended to look at the ways people used/interacted with the technology or each other rather than furthering any understanding of the viewer’s learning around the exhibit. The detailed research did nothing to address the issue of how the technology impacted on people’s understanding of the artworks.

Both of the above exhibitions used technology’s potential to animate, visually illustrate and penetrate under layers of paint and to ultimately become a window to a level of interpretation unattainable with the printed word. Additionally, the above use of technology even though it does little to modify canonical art historical interpretation, does allow for designers, educators and historians to work together to use technology in a ‘convincing, accessible rather than gratuitous way to illuminate our understanding of process and material of the past’.

In 2008 the British filmmaker Peter Greenaway was invited to re-invent Leonardo da Vinci 510-year-old painting of ‘The Last Supper’ as a sound and light installation.

To the strains of modern opera, he used cutting-edge technical trickery to make Leonardo’s Christ appear like a three-dimensional hologram while a radiant sun rose and fell over his head. He turned the original colourful image red, grey and black before the artist’s gentle brush strokes were replaced with a chalk outline of the 13 figures, as if Leonardo had drawn a crime scene. Dawn broke, dusk fell and by the end the disciples had been dramatically cast into the shadow of prison-like bars.
(Booth, 2008)

Even though no physical alteration to the original artwork was made, Greenaway’s vision of the work made it look three-dimensional as if com-
ing to life and extending in space. Despite some people’s strong opposition of Greenaway’s work, describing it as cultural vandalism (Booth 2008), no one can deny that the artist’s technological intervention bestowed the painting with new life, one that was always underneath its presence but never actualised in this manner; the painting’s own cinematic narrative. The viewer faced the painting as if for the first time, forced to look at it as the changing lighting effects on the painting created multiple points of view, each time pointing at a different direction while maintaining the illusory character of the original perspective painting. In all of the above examples, merging the old technology of drawing and painting with new digital technologies is a strategy that has great potential for it immerses the viewer with the work, and creates new contexts that a simple text label or catalogue is inadequate to achieve.

**CONTEMPORARY APPLICATIONS: FAILURES AND SUCCESSES**

During a survey in 2001 at the San Diego Natural History Museum visitors ranked computers very low in their preferences suggesting that what they sought in a museum visit was something entirely different from what they were doing all day, which often involved a great many computer tasks (Hafner 2004). In a 2004 article in the *New York Times*, Katie Hafner suggests that ‘until recently, computers were seldom used creatively. More often, they were little more than information supplements, glorified, trackball-assisted posters or charts filled with text that few visitors took the time to slog through’. Especially for art museums, digital technologies used to be a supplement for increasingly more information about collections; the result of museums’ enthusiasm about the possibility of large memory banks fulfilling the desire of maintaining art historical authorship. It can be argued that the original cabinet of curiosities vanished under the weight of information overflow. In effect, the question whether technology is indeed useful for museums and whether its applications effectively change museum practices remains unanswered.

There are museums that have maintained a sceptical stance toward technology in the actual museum and viewed it mostly as a danger rather than a panacea to access problems. In effect, such museums – the British Museum in London is one such example – have used little overt technology in their
permanent displays. Technology in these cases is pitted against art and artefacts, where maintaining what Walter Benjamin defined as the original’s ‘aura’ maintains its importance. Feeling comfortable in their orthodox role, such museums seem to consider the uses of technology in the face of the real thing a sacrilegious act. An example, was the latest use of technology by the British Museum, for room 61 which re-opened in 2009 with an exhibition based on the tomb-chapel of Nebamun. An exhibition about life and death in ancient Egypt, room 61 displays the famous newly restored wall-paintings that date from about 1350 BC. The frescos displayed from the tomb of Nebamun are surrounded by objects from the same period which provide context for better understanding the life of the wealthy official, Nebamun. A three dimensional animation of the tomb aims to contextualise what the visitor sees in the galleries and imaginatively places paintings and artefacts in their original context. Articles about the specific exhibition made reference to an immersive environment:

Now, in Room 61, he tries to recreate the setting of the fragments, to help the viewer experience something as close as possible to actually walking into the burial house of Neb-Amun now lost in the desert west of Luxor. An interactive computer simulation shows you what the house would have looked like in its natural setting - and then there are the paintings.
(Soueif, 2009)

Even though the journalist is enthusiastic about the possibility of re-creating the experience of walking into the burial home, the reality is far removed from such experiences. Instead, the screen is displayed behind a wall separate from the rest of the exhibition (and easily missed). It is not possible to view the technology and wall-paintings at the same time. The curators’ apparent skepticism, even technophobia, is rather obvious in the way in which technology was handled.

However there are reasons for the reservations. In 2012/13 a new large interactive touch screen was placed on the walls of a gallery few feet away from the Gebelein man (a naturally persevered mummy that has historically been a highlight of the collection). After research via CT scans and a virtual autopsy the large interactive display that allows the body to be manipulated
and uses hot spots to disseminate information was a compelling addition to learning about ‘Ginger’ the affectionate name given to the mummy who has red hair. Research undertaken by students at the Institute of Education in the gallery revealed two changes in visitor behavior. In brief they spent less time looking at the mummy sometimes not relating the screen image to the mummy itself and second were not always successful at using the sophisticated technology. Keying into the popularity of forensic police science visitors are invited (on the web) to use the autopsy table and find out about murder on Ancient Egypt. While a compelling addition to the display of Gebelein man more research is needed on how to maintain attention on the mummy and how to instruct users on the use of technology in the gallery itself.

**CONCLUSION: TECHNOLOGY AS A THING IN ITSELF**

*The argument that technology is not a neutral force for good but one that is driven by social forces was advanced by Raymond Williams in 1979, with specific reference to communication technologies. The argument against technological determinism runs that just because we are capable of doing something it does not automatically follow that we ought to do it. …The uses to which we put technology often shape its future development.*  
(Meecham and Sheldon, 2005, p. 285)

The literature on technology in the museum has been marked by deep division arising from the historical, intellectual and practical conceptualisations of two distinctly different disciplinary domains: museum studies and computer science. Although it would be tempting to characterise technology’s arrival in the museum as a welcome and expedient breath of fresh air amongst the dusty relics of the past breathing access and inclusion into objects resistant to easy interpretation as the new verses the old, that would be to paper over an ideological divide around the relationship between technology and the material culture of the museum: broadly speaking a schism between technology in search of a job to do and the ‘thing itself’. According to Heidegger, technology is also about revealing and in that sense a useful metaphor for technology’s dual role in the museum. In Heidegger’s essay ‘The Question Concerning Technology’ he advised:
We shall be questioning concerning technology, and in so doing we should like to prepare a free relationship to it. The relationship will be free if it opens our human existence to the essence of technology. When we can respond to this essence, we shall be able to experience the technological within its own bounds. Technology is not equivalent to the essence of technology […] the essence of technology is by no means anything technological.

(Ibid, 1993, p. 311)

In his essay, Heidegger provides an important lesson for museums that need to consider what technology really is, before applying it in their collections. A better understanding of the essence of technology can only create a better relationship with it since potential misuses are minimised if not eliminated. Also, understanding that technology is not just a computer or a machine, or anything technological, but all that one could utilise for a purpose, is significant for the museum if it seeks to establish a more balanced relationship between technologies ‘old’ and ‘new’. Instead of dismissing the ‘old’ the museum could consider the possibility of combining the two, as we saw in Greenaway’s intervention, something that can prove to be useful for learning. If museums think of technology in this way, the essence that Heidegger spoke of, becomes one of possibility, bringing technology closer to the notion of Greek techne; a form of creative poesis.

Technology is not yet at the core of museum activities on site, in many cases it is dispatched to the virtual and actual periphery of museum activity: the preserve of education (itself often on the margins of museum activity/hierarchy). In some cases however technology offer the possibility of viewing and recreating the museum, by means of web sites, as a virtual gallery. The traditional curatorial system can be bypassed and viewers can create their own museums, collect their own works and install them in their own homes - an electronic museum without walls. Moreover, by building technology into exhibits themselves and using new media in creative ways audiences can engage with art and artefact and work with their own entrance narratives to create new knowledge. Museums are working towards effective incorporation of technology in exhibits and working at ways of incorporating technologies within a changing landscape of audience participation. Social networking sites such as Facebook and Twitter have now become common-
place tools in the drive for new audiences. However, if museums cling to their Enlightenment origins and attachment to exhibitions as a primary function it is unlikely that democratization within and without its walls can take place. The huge (if singular) success of the BBC’s British Museum collaboration in 2010/11 ‘The World in a 100 Objects’ delivered on antediluvian Radio 4 demonstrated that collections can be listened to, that new narratives can be compelling.

Opening up access to the *Netful of Jewels* (Anderson 1999) via digital technologies was at the forefront of museum directors thinking before the end of the 20th century. Digital museums would deliver access and services in a variety of ways: publishing being one of them, participatory activities with ‘two-way interaction’ between users, museum staff and many different publics’ (Anderson 1999) another. The development of archives (the wallflower of public services) in the last decade has aided museums in uncovering hidden and repressed histories with which the public are being asked to interact. Creating new narratives, digital histories and user-generated content is challenging the authority of the museum. The use of fiction and the consumption of digital artworks provides further challenges. Being providers of such services could change the relationship of museums to the new consumer who currently may well see the museum as a social venue, site for scholarly activity or shopping outlet rather than as a glass cabinets of curiosities.

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ISSN 1654-7608
E-journal: ISSN 2001-7480
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