ARTICLE

Digital Museum Objects and Memory: Postdigital Materiality, Aura and Value

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Abstract   In the cultural sector we use digital museum objects every day; in exhibitions, websites, collections management systems, and on our social channels. But, what actually are these objects? Do we understand them as objects in their own right? With their own nature and essence?

In this article, I define the digital museum object as a true and faithful digitised image of a physical museum object (in 2D and 3D) or a born digital object. I argue that the continual insistence upon conceptualising the digital museum object in relation to its physical counterpart precludes full understanding of its value and agency. I suggest that recasting and recalibrating how digital museum objects are considered in terms of materiality, authenticity and aura will open collections to more democratised forms of interpretation, and position them as active participants in the formation of transcultural memory (Crownshaw, 2013; Schofield, Foster-Smith, Bozoğlu, & Whitehead, 2018). Building on data collected through surveys and semi-structured interviews with museum professionals, I will present an overview of current thought in the sector and make the case for moving forward to models of display that are necessarily aware of their impact on memory-construction and are thus fundamentally polyvocal in nature.

WHAT EXACTLY IS A DIGITAL MUSEUM OBJECT?

For museum professionals, the digital museum object is ubiquitous in its existence. Used in numerous capacities – documentary, collections management, marketing, education – for decades, the sector has come to depend on digital collections. Yet, if I were to ask you to define the digital museum object, could you? Is it possible to truly describe the essence of an object that we cannot touch or hold in our hands? One that we cannot feel the weight of, smell or taste?

This article will begin by considering differing conceptualisations of digital museum objects both in literature and through recent surveys of, and interviews with, museum professionals. From this research, several key and interrelated concepts will emerge – materiality, aura and value – which will be considered, theoretically and practically. In particularly, materiality and aura will be posited as two intertwined characteristics of the physical object that are

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deemed to create a distinct type of value which are thus typically judged to be lacking in the digital museum object (Burns, 2017, 4). Finally, positioning the digital museum objects at the centre of networks where information is shared, and can be captured, the impact of interacting with digital collections upon wider cultural remembering will be explored.

Despite the prevalence of digital objects in cultural contexts, a concrete and agreed upon definition has remained elusive.[1] For the purposes of this article, I will define the digital museum object as a true and faithful digitised image of a physical museum object (in 2D and 3D) or a born digital object. However, in the museum sector, institutions exist in diverse forms; custodians of wildly different collections (art, natural history, archaeology and more), comprised of different staff with individual knowledge, skills and visions. Thus, for each organisation, the digital object – as text document, image, sound, audio or audio-visual recording – also exists in diverse forms.

To illustrate the lack of consensus surrounding the definition of the digital museum object, take the following definitions employed by three large cultural organisations;

- Europeana (Europe's digital platform for cultural heritage) – "A digital representation of an object that is part of Europe's cultural and/or scientific heritage. The Digital Object can also be the original object when born digital."[2]
- National Digital Stewardship Alliance (NDSA), – a "conceptual term that describes an aggregated unit of digital content comprised of one or more related digital files. These related files might include metadata, derivative versions and/or a wrapper to bind the pieces together."[3]

- CIDOC (International Committee for Documentation of the International Council of Museums) – "This class comprises identifiable immaterial items that can be represented as sets of bit sequences, such as data sets, e-texts, images, audio or video items, software, etc., and are documented as single units." (Doerr, Stead, & Theodoridou, 2016, 6)

Though these definitions find their grounding in technical terms, there are distinct references to conceptual themes such as immateriality and representation. But, which of these, or indeed any of the circulating and diffuse definitions, articulates the essence (the distinct and often abstract character ascribed to an object), of a digital museum object?

Conceptualisations of digital museum objects also vary within cultural contexts. For example, as various articles in a 2012 special issue of the Journal of Material Culture, 'Digital Subjects, Cultural Objects' demonstrated, the essence and value of a digital museum object can be conceived of differentially contingent upon the cultural settings within which they are created, cared for, used and shared. In the case of Māori and Canadian First Nations communities, objects have long been considered "repositories and catalysts for generational information", qualities that are naturally extended to the digital object (Brown & Nicholas, 2012, 310). Appreciating the nuanced specificities pertaining to the nature of the digital museum object in varying cultural groups is a key responsibility of museum professionals in the postdigital environment.

One could be surprised by the fact that only recently has the academy begun to meditate upon the nature of the digital object. Traditionally studies have tended to consider the impact of the digital museum object upon how we think

and act (usually in opposition to the physical). New media theorists have considered the influence of technology (that allows us to view these objects) upon our lives (Manovich, 2002, 44). And cultural theorists have examined the impact of digital technology upon wider social, political and economic trends (Cameron, 2007; Cameron, Kenderdine, Thorburn, Barrett, & Jenkins, 2010; Henning, 2005; Light, Bagnall, Crawford, & Gosling, 2018). Scholars of memory and media have traced the exchange and proliferation of digital images as they constitute, replicate and propagate current events, and for their ability to reflect wider understanding of and attitudes towards particular historical moments (Hoskins, 2011, 2016, 2017). Finally, in museum studies, discourse has tended to focus upon the propensity of the digital museum object to engender new and broader types of engagement (Budge, 2017; Geismar, 2018; Hogsden & Poulter, 2012). Yet, to this point, very little thought has been devoted to understanding exactly what the digital museum object *is*, and thus the value it holds in its own right.

One of the first academic studies to deal purely with digital objects was conducted by Yuk Hui, a philosopher and computer scientist, who in 2016 published *On the Existence of Digital Objects*. Hui positions digital objects as their own discrete category occupying a specific position within pre-existing schemas, stating, "we can have a superset of objects, inside which we can find a subset of objects called technical objects alongside natural objects…It is also understood that within this subset, we can find a further subset of objects called digital objects." (Hui, 2016, 49).

Thus, although digital objects are to be found within preceding frameworks, unique qualities – described as pervasiveness and ubiquity- put them into a category of their own (Hui, 2012, 2016, 2017). These same qualities have been noted by other scholars including Berry and Dieter in their conceptualisation of the postdigital. Berry and Dieter maintain that digital technologies, products and systems are no longer optional; they are embedded in our societies, our lives and our museums (2015, 4). It would be extremely difficult, if not impossible, to live a 'digital-free' life. For museums, the recognition of the postdigital condition is critical in that it provides a framework within which to understand, recognise and analyse the expectations of visitors who no longer differentiate absolutely between the physical and digital but instead anticipate a seamless intertwining of both (Parry, 2013, 25). The museum must ask what this undifferentiated approach means for the digital museum object.

CAN WE SEPARATE THE DIGITAL FROM THE PHYSICAL?

Returning to a single word mentioned in both Europeana and CIDOC's definition of the digital museum object gives rise to an interesting question; is the digital museum object always a 'representation'? Can it possess none of the qualities of its physical counterpart (if it has one)? According to Hui, the digital object occupies its own category, why then, is it continually articulated within structures of value, materiality and authenticity formed and rooted in the physical?

In 2018 two data-gathering exercises were undertaken. The first comprised semi-structured interviews with three museum professionals working in the US and the UK. These sought to understand the perceptions of the digital museum object held by those working in curatorial, digitisation and learning and access roles. As a secondary, and complimentary

endeavour, a non-probabilistic self-selecting web-based survey was issued, eliciting a total of 146 valid responses.[4]

Before delving into the responses garnered from these interviews and surveys, it is useful to establish context around the central and dominant position held by objects and collections in museums. For museology, and museums in general, physical collections are valued above all else. They are, after all, the reason that the majority of institutions exist. In preceding decades, there has been a great deal of conversation, and concern, pertaining to the fact that the presence of digital objects obfuscates the primacy of the physical object (Anderson, 1999; Were, 2014). Many attribute this to the presence of digital technologies, whether provided by the museum or through the visitor (i.e. a smart-phone used to take selfies in the physical museum space), which are perceived to detract from a purer, unmediated experience. Despite this concern, academic studies have found that when digital technology, specifically social media, is involved, the object's privileged position is retained (Budge & Burness, 2018, 143).

I argue that in insisting that the existence of the digital object detracts from the physical- or original- object, it is placed into a hierarchical system of value in which the digital is forced to occupy the lower position. Much of this belief is predicated on the Benjaminian notion of aura and the surprisingly wide-spread and persistent assumption that the digital object, by way of its immateriality and intangibility, is inherently precluded from possessing this magical quality (Biedermann, 2017, 284). Often, these exchanges rely upon the idea that an aura is bestowed upon the object through the touch of its creator(s), the visible patina of age and its occupation of a perceived original position (the famous example being the ceiling of the Sistine Chapel painted by Michelangelo), distinct

characteristics many judge absent in the digital object (Benjamin [1937] 2008).

This idea of an original, physical and thus most valuable object, is prevalent in the responses of those interviewed and surveyed. When asked 'how would you define the digital museum object?' many opted to describe it in terms of its relationship with the physical object. Figure 1 illustrates the split of opinion which is, of course, constrained by the options provided within the survey.

Though many of the options provided in Figure 1 appear similar, perhaps even identical, language plays an important role here. Complement, surrogate and copy are words in common museum vernacular that carry subtle yet distinct meanings, often relating to ideas of value and materiality. 'Surrogate' literally means to stand in for or to act as a substitute, implying an object (or person) of secondary importance. In possession of a different tone, 'complement', conjures notions of an ancillary entity that is used to increase the value of the core 'thing'. Finally, 'copy' extends the concept of the facsimile, a type of Benjaminian reproduction that becomes by default, an 'aura-less' object.

The pattern observed in the survey responses is both corroborated and destabilised by interviewees. When asked to define the digital museum object a Director of Digitization stated it to be, "*a surrogate, that is when you actually have a physical object and you make a digital replica of it, copy of it.* The second museum professional interviewed, a Curator of Photography, declined to use a specific term for the digital museum object instead choosing to describe it on its own terms, "*One would be material that is born digital, that has never had an analog presence. So particularly in photography right, digital photography is a good example of that, but also the digital museum object can be an image of a museum object that has been digitized in some way.*
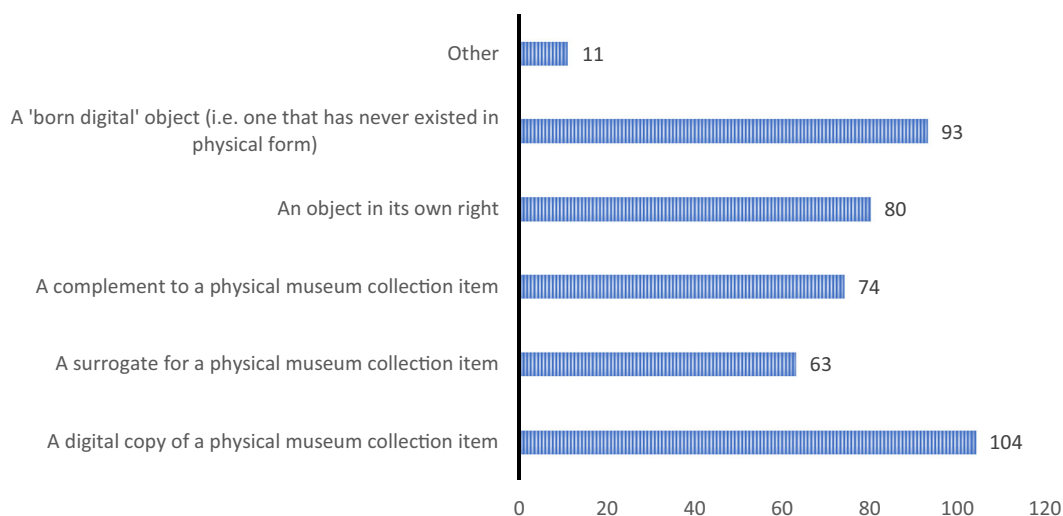
Figure 1. How would you define the digital museum object? (Credit: Author)

That could be 2D, that could be 3D, it could be an audio recording."

The final interviewee, a Learning and Access Curator, was hesitant to vocalise a concise definition having never pondered the nature of the digital museum object (a category that many museum professionals would fall into). Their response, echoed by several free-text comments in the online survey, drew upon the material and immaterial characteristics of the digital museum object; "*I guess an object that you look at on a screen in some way. That you can't touch, I think. I don't know, maybe it's a photograph, a video*". Here, the digital museum object is defined by our inability to employ all of our senses in the discovery of it, and above all by the impossibility of touch, of feeling its texture, its shape and its weight as we would with a physical object. In the case of the digital object this presents major issues with respect to assessing authenticity (Korsmeyer, 2012, 365). How can we truly judge an object if we cannot follow traditional mechanisms of establishing authenticity? For Dudley, this is a situation replicated

in the museum setting with the physical object that resides always inside its glass case. In this situation, she suggests, we might use our imagination to deal with the acutely felt absence to, "involuntarily add some sensory dimensions further to the visual, automatically suffusing my sight experience of an oil painting with an intuited and probably subconscious sense of the roughness of its visually evident three-dimensional surface" (Dudley, 2009, 19).

Though we can make this comparison between the untouchable physical and the digital, we must also consider the barrier presented by the interface, the screen through which we must view the digital museum object. It is the presence of the interface that makes interacting with the object both possible and somehow impossible. Hookway describes the interface as a site of production, "defined by the simultaneity and inseparability of its processes of the separation and augmentation, of maintaining distinction while at the same time eliding it" (Hookway, 2014, 4). Thus, the interface is a mediator, but not necessarily a detractor.

LIVING IN AN IM/MATERIAL WORLD

If we cannot touch an object, is it necessarily immaterial? Figure 2 elucidates the breadth of opinion held by the museum professionals surveyed with respect to the materiality of the digital museum object. The majority, 48% of respondents, believe the digital object to be both material and immaterial. Examining the data in greater detail highlights differences in opinion existing between those occupying differing roles within the museum. Notably, those employed in a research capacity were less likely to think of the digital object as an object in its own right (33%) in comparison to those working in digital (57%) and collections management roles (62%).

Respondents to the survey also had the option of elaborating upon their answers through qualitative free-text responses. In many cases these provide a valuable and nuanced complement to the quantitative data generated. Analysed as a single corpus themes emerge indicating several tranches of logic employed in judging the digital object to be material. Physicality, primarily touch, was again highlighted, however in this case in the context of acknowledging the physical means, specifically hardware, used to access the object. Some museum professionals noted that interacting with and appreciating the digital object requires bodily movement and the use of physical senses. And although objects may exist digitally, many underscored the physical needs of the digital object (e.g. in relation to preservation and prevention of degradation). Lastly, one respondent stated that a digital object is a material object "*Because it can have a material effect on*
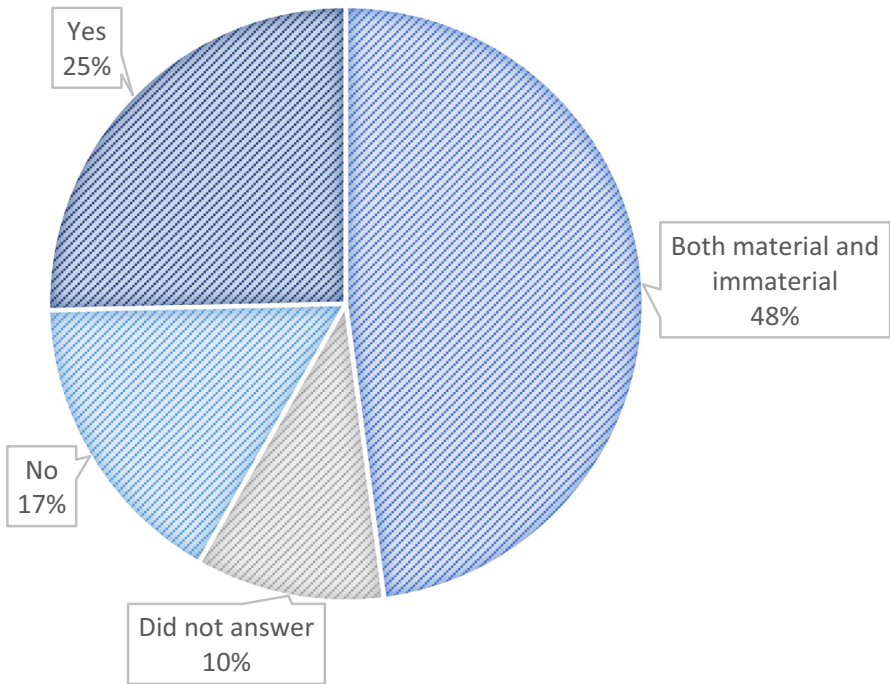

Figure 2. Do you perceive the digital museum object to be a material object in any sense? (Credit: Author)

understanding and interpretation", in other words, such objects have the capacity to enact change, a sentiment that echoes Leonardi's concept of digital 'practical instantiation' (Leonardi, 2010).

For those who deemed the digital museum object to be entirely immaterial, age, or more precisely, the ability to see age on a physical object, was the main motivating factor. The patina of an object as proof of authenticity and testament to years of use was deemed especially significant and deemed notably absent from the digital (Foster & Jones, 2019, 13).[5] In many ways, a digital museum object is an object caught in time – its interface does not age, even if its bits and bytes do. But that does not mean that it cannot be damaged, broken or lost, much like the physical.

Similarly, for the museum professionals interviewed, materiality was defined by way of physicality; *"there is a tangible thing there that you see, you can hear and can relate to"*. Another interviewee echoed these thoughts but noted the following caveat, *"you can still use your senses to understand it. But you can't use all the same senses as with a physical object."* Responses to both interviews and surveys make it apparent that, within the sector currently, it is extremely difficult to remove oneself from the physical-digital comparative framework in assessing the materiality of the digital.

Views upon materiality of the digital object play a commanding role in designations of value. If the digital continues to be positioned relative to, and thus inevitably in a lower position, the physical, it will continue to be determined to be of lesser value. I argue that the sector cannot truly appreciate what the digital museum object is, and can do, if it is not valued as separate from the physical. This is not to say that the relationship between the physical and digital should be suspended and ignored but that in failing to consider the digital in its own right, we fail to truly comprehend its impact upon cultural economies, specifically audience engagement, knowledge acquisition and memory production.

A TALE OF POTENTIAL

A recurring theme woven into the responses of museum professionals in both interviews and surveys was the potentiality of the digital in terms of provoking and facilitating the formation of connections by diverse audiences. One survey respondent expressed this sentiment neatly, detailing that "*These links can be speculative, encouraging non-traditional interpretation, or allowing for the presentation of relationships that wouldn't be physically possible.*" Thus, though many previous statements related to what the digital can do for the physical, there remained recognition of the value of the digital in and of itself. For museum professionals, digital technologies have opened space for innovation in the postmodern sense where new and democratised forms of knowledge are generated (Cameron, 2003; Fouseki & Vacharopoulou, 2013, 326). Take, for example, the groundbreaking physical and virtual exhibition *Some Were Neighbors* staged by the United States Holocaust Memorial Museum (USHMM).[6] By allowing visitors space for meaningful participation through commenting upon and tagging of digital objects both in-gallery and online, the USHMM facilitated conversation between spatially dispersed visitors visibly within the museum space. Unmediated, to a certain extent by the museum, new connections and interpretations of these objects sprang into being.

Yet, this polyphonous interpretive utopia is a vision to be treated with caution. Digital museum objects occupy multiple spaces, their meaning constructed differently in accordance

with the interpretive frame within which they are consumed. Moreover, whether a visitor encounters the digital museum object on a museum's website or collections portal, social media or untethered in a google image search, the mode of access is always the internet, an imperfect entry point at best. A truly democratised mechanism of access and interpretation would not look like the internet in its current form.

It is easy to take the internet at face value and to consider it merely the portal through which we retrieve information. Yet, the reality is much more complex (Selfe & Selfe, 1994, 484).[7] The internet is not a neutral container, it is an intricate structure existing in a thoroughly specific context (political, cultural, economic and social) that has determined, from software to algorithms, the form it assumes today (Mihelj, Leguina, & Downey, 2019, 7). There are unseen rules and rubrics that govern its navigation, meaning that if potential museum visitors are not embedded in or given the opportunity to learn these systems, collections and information will be inaccessible to them. The internet is predisposed to work for a core 'norm' – those who constructed it and continue to build within it – and marginalises a perceived 'other'. In many ways the internet has failed to reach its democratising potential and has simply replicated the power structures that many hoped it would thwart (Noble & Tynes, 2016, 2).

Intersectional studies of the internet have convincingly exposed the insidious structural bias embedded within all of its many facets. For many, the manifestations of these inequalities begin and end with the ability to actually log on. Although the number of people globally with access to personal computing devices is on the rise, there remain huge blank spots. The International Telecommunication Union (ITU), the United Nations'

specialised agency for information and communication technologies, publishes an annual report assessing global internet access. A key finding of their 2018 report states;

> "In developed countries, four out of five people are online, reaching saturation levels. . ..In the world's 47 least-developed countries (LDCs), Internet uptake remains relatively low and four out of five individuals (80 per cent) are not yet using the Internet." (International Telecommunication Union, 2018)

Roughly, this means that for every five people, three fewer in the world's 'least developed' countries have access to the internet in comparison to those countries perceived to be 'most developed'. The disparity, in real terms, is huge. This statistic does not even scratch the surface; a suite of issues resides in the murky depths of the internet's structure and content, including type and speed of access, place of access (work or home), gender-based access and the level of education needed to know how to actually find information once online (Sterne, 2012, 7–8). Furthermore, not only is the internet rife with issues of classism, racism, ableism and sexism, gaining physical access to it involves surmounting these same barriers (Sweeney, 2016, Gitelman, 2008). Thus, although, we can advocate for polyvocal interpretation of digital museum objects and argue that their presence has an impact on the formation of transcultural memory, we can really only do so for a portion of the global population (Crownshaw, 2011, 1). Consequently, judgements determining the value of a digital object are made from an unequal grounding.

VALUE AS A NON-RELATIVE MEASURE

The issue of value as it relates to digital cultural collections has been explored by several

scholars (Hedstrom & Lee, 2002; Hockx-Yu & Knight, 2008; Tanner, 2012). Much of this research has focused upon the ability of the digital to preserve or engage people with the physical, but does not go beyond this. Considering the complex, broad and often ephemeral nature of the interactions between the public and digital collections, this is unsurprising. Tanner writes;

> Measuring and interpreting the broad impact of digital resources remains a complex undertaking. There is a mass of extant evidence, but attempts to interpret such evidence often tends to rely on commonplace assumptions about the nature of digital resources, without fully appreciating the actual way in which end users interact with such digital content. Digital projects and programmes need to engage with-...how does this change people's lives? (Tanner, 2012, 23).

When surveyed, museum professionals typically assigned multiple values to digital museum objects. Though, as can be observed in Figure 3, 'cultural', 'social' and 'preservation (of the physical object)' are selected with notably higher incidence. Those sitting at the lower end of this spectrum of value include 'uniqueness' and 'financial', a situation that may reflect the ease of replication and distribution, also noted by Kallinikos et al. as defining characteristics of the digital object (2010).

For interviewees in particular, when asked to divorce the digital museum object from its physical counterpart, different facets of value began to emerge. One museum professional stated, *"there is something compelling about real life objects that will always be compelling but what is nice about the digital is there's a certain type of compelling use that you can get out of those that you can't with the original…so they both have their place and their value."*

The 'certain type of compelling use' noted here is the opening up and offering of new possibilities. In the space between the object and the individual – or Gere's digital contact zone where "the museum can be seen as a node in a network of interactive relations, where culture, communities and people can meet and exchange ideas" – cultural value is added through new types of interaction and engagement as is witnessed in the *Some Were Neighbors* exhibition (Gere, 1997, 63). The object acts as the nexus or meeting point of different interpretations, each shaping and moulding one another; in a way that is not fully possible with the fixed physical object and through which the museum can be challenged. The ability to map and record such interactions with fidelity would paint a picture of value and perhaps also of prevailing trends of transcultural memory.

GENERATIVE OBJECTS

One interviewee offered an example in explanation of the generative value of interactions around the digital museum object. In 2015 the Smithsonian Digitization Project Office 3D scanned the skeleton of a woolly mammoth and published it on their website.[8] The 3D model was uploaded free of restriction, meaning that anyone (with the necessary equipment and skills) could download it. The file size proved unwieldy for many until in 2018 a toymaker and comic artist based in Japan decided to intervene. He reduced the file size and split it into parts which could be printed separately and then assembled into a full model complete with articulated limbs. A guest blog post by the maker, published in the form of a manga, provided a guide that allowed this process to be replicated by others (Gensyou, 2018). Although, arguably the fidelity of the data has been compromised (though that could be said of all digitisation and
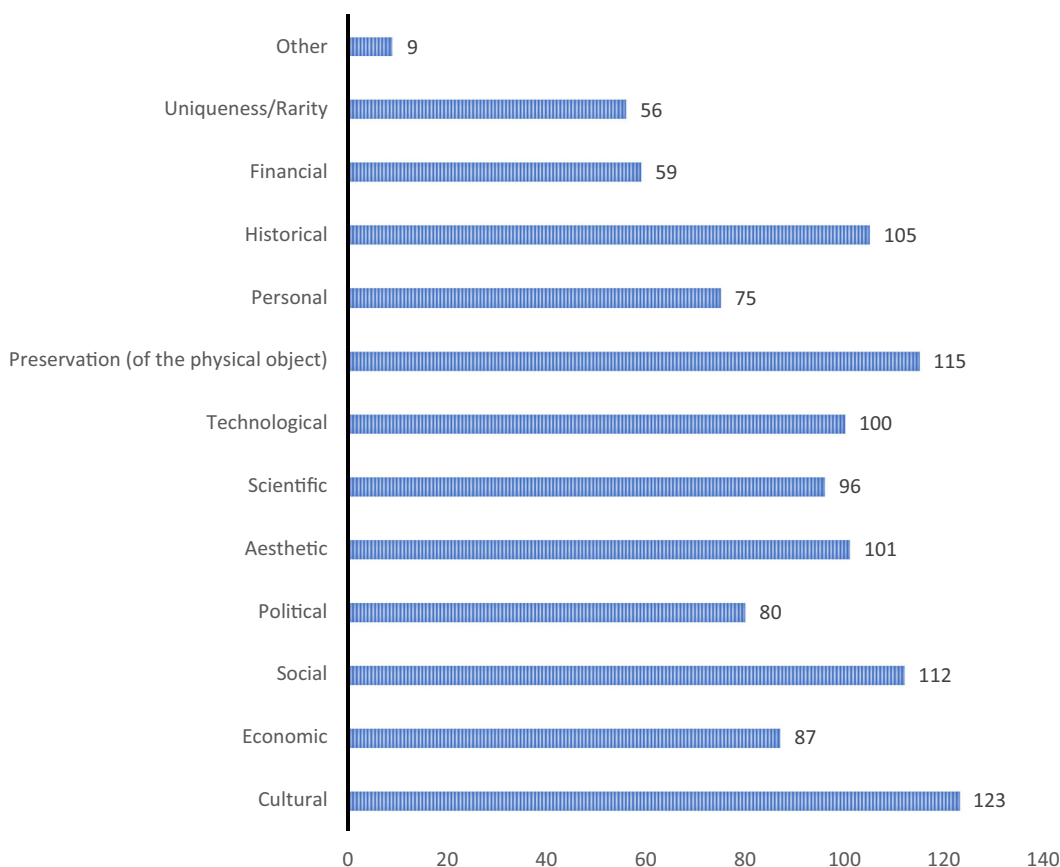
Figure 3. Differing values attributed to digital objects (Credit: Author)

modelling projects), the Smithsonian's woolly mammoth has established a kind of agency of its own, making new types of connections with global audiences.

In reference to this turn of events, the interviewee noted that the 3D digital woolly mammoth skeleton had become a source that "*maybe takes on this new kind of, for lack of a better word, aura, of a type of original that was the progenitor of whatever cleaves off of it.*" The idea of the digitised object as an 'original' (discounting born digital of course) spawning its own lineage of valuable objects (physical and digital) is somewhat destabilising for the museum sector. The

agency displayed by digital objects problematises the understanding of museum collections as fixed entities only to expand through the actions of the museum.

The second element of this interviewee's statement worthy of scrutiny is the invocation of 'aura' and its possible application to the digital. Indeed, this is not the only instance in which aura was cited by interviewees and survey respondents. The following is an excerpt from a full and adroit free-text response to a survey question asking, 'Do you think interaction with digital museum objects impacts cultural memory formation?';

"Digital engagement with museum objects is likely to transform culture (including 'cultural memory') in unpredictable ways. Its first transformation is evident in the transmission and proliferation of digital objects across multiple platforms. This has the potential to 'democratise' cultural interpretation and its narratives, activating other voices not generally or well-articulated by established cultural institutions. On the other hand, the digital object's insertion into, and circulation within, a wider economy of cultural and commercial exchange also has the capacity to break down the traditional 'aura' of museum objects and cultural artefacts. This may be beneficial in many cases, but the resulting potential commodification of museum objects (digital or physical) may further transform the nature of cultural memory and its values in community and society."

I would like first, to highlight the interesting turn of phrase employed here—'to break down the traditional aura' which neatly encapsulates the liminal position in which we now find ourselves. Traditional views, which could be described as maintaining the primacy of the physical object, sit uncomfortably (despite decades of digital presence) alongside the digital object.[9] The continued digitisation of museum objects and resulting proliferation of websites, online exhibitions, collections portals and third party aggregator sites, exacerbates the odd endeavor that is the continued positioning of digital and physical in binaries of value, authenticity and materiality. Indeed, it appears that the cultural sector may be required to 'break down' and rebuild the concept of aura for the postdigital museum.

Of course, the aura of the digital object cannot be the same as that of the physical. As one interview put it, "*It is not the same because that connection isn't there. The real thing makes. . .the*

events that it saw real." But, I ask, is it only the object's presence at a certain event or touch from its physical creator that produces an 'aura'? Might the digital museum object's aura simply be different rather than absent? Perhaps, it is the cumulative total of differing audience interactions – explicit and implicit – that become its virtual patina, or aura. Perhaps some of its aura resides in the possibilities, realised or unrealised, and positioned against the authorised heritage discourse, that it presents to both museum professionals and visitors (Smith, 2006, 116)? It is the combination of these that we may be able to map as networks, capturing heterogenous relations, flows of power and the democratisation of the authentic voice (Cameron, 2003, 327, Law, 1992, 380, Castells, 2000, 500, Gere, 1997, 65).

POLYVOCAL DIGITAL OBJECTS AS MEMORY PRODUCERS

In recognising the democratising potential of a polyvocal interpretive structure surrounding the digital museum object, we can begin to envisage a museum that captures, reflects and codifies a unified transcultural memory, rather than an institution that privileges its own voice and knowledge above others. It is a lofty ambition, yet it is a necessary one. Over half (57%) of survey respondents believe that interacting with digital museum objects impacts the formation of cultural memory. Tellingly only 3% think that it does not, with the rest remaining undecided, suggesting that it this is a subject that has not been tackled in as much depth as necessary within the sector. Those who elaborated upon their response noted their hesitation to commit to a particular response with many feeling that they could not or *should not* answer due to a perceived lack of experience or dearth of access to knowledge that would provide a strong evidence base from which to make judgement (Figure 4).

In demonstrating the potential of digital museum objects as discursive spaces within which to promulgate but also to problematise tropes embedded with the power structures of cultural institutions, we can look to theories of meaning-making and knowledge production (Cameron, 2003. 336). Sitzia argues that meaning-making, though focusing upon individual and societal engagement with the object and subsequent bestowing of value and aura upon it, is in its object-focused incarnation, dictated by institutional narratives (2017, 78). In contrast, knowledge-production flips this situation on its head and deems the knowledge produced by the learner in relation to the object to be key. In the former situation, the object is judged to have intrinsic value, in the latter, the object simply sparks the process (Sitzia, 2017, 78, Rancière, 1991, 33).

If we apply the knowledge-production model to the digital museum object, we see the object as a point of connection between learners, or visitors, where knowledge is produced by the learners. Of greatest salience here is that there are many types of links – between objects, between people, and between objects and people. Such interrelations are manifold in the digital sphere, or contact zone, encoded in a network that exists across temporalities and geographies. Plotting such networks is to harvest new non-institutional knowledge and to visualise value. In times where debates around alternative facts and post-truth are prevalent, describing how and why an object is culturally valuable from multiple perspectives is critical. Working in this manner, to create truly polyvocal interpretation, would assist visitors and museums to enter into an iterative dialogue about their object, where neither is privileged over the other but preserved side by side, and would transform the museum as memory institution.

MAKING POSTDIGITAL MEMORIES

Since the advent of digital technology, theories of memory have been necessarily recast, being required to attend to evolving notions of community, nation and culture. The postdigital condition requires that such an undertaking be repeated.

In recent years, scholars of memory have focused on the movement of memory; Erll has developed the theory of travelling memory (2009), Rothberg has written of multidirectional memory (2009) and Hirsch has focused on the passing on of memory intergenerationally (2012). These theories all, in some way, attest to the notion of memory as mobile; as passing across lacunae, between people, groups, communities, and time. Concomitantly, there has developed a vein of thinking in which memory scholars attend specifically to the transformation of memory as it spans nations and cultures. The use of 'trans' in theories of transnational and transcultural is helpful in foregrounding movement but perhaps does not adequately capture the new form or flavour memory takes as it is transmitted across porous borders, or pools in the gaps between groups (Crownshaw, 2011; Crownshaw, 2013; Rothberg, 2014). Yet, for the purposes of this article, Crownshaw's theory of transcultural memory bears the most fruit when applied to postdigital remembering through, and with, the digital museum object.

In a play on Assman's 'cultural memory', Crownshaw postulates that it is more productive to think about "cultures of memory", where memory is "a process "embedded in social networks" rather than solely and statistically in institutions, sites, objects, texts or people" (Assman, 2010; Crownshaw, 2013, 1). Thus, transcultural memory addresses the movement and transformation of group remembering and
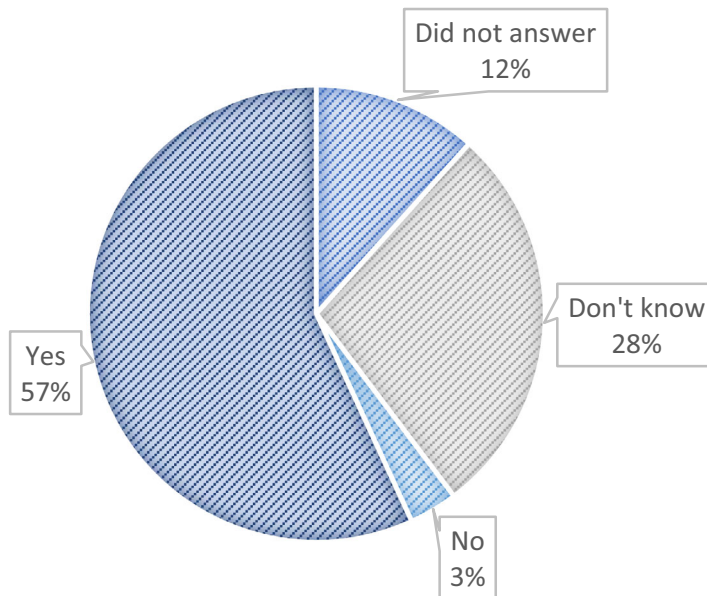
Figure 4. Do you think interaction with digital museum objects impacts cultural memory formation? (Credit: Author)

crucially, pays specific attention to the impact of such transmission upon all participant cultures. In acknowledging that certain cultural formations, ideologies, and politics cannot be directly translated across cultural boundaries, transcultural memory highlights the iterative interactions affecting both the transmitter and receiver of the memory.

Digital museum objects could be proffered as a location where people, and cultures, meet – a transcultural space perhaps (though, one that is always mediated by the museum). In this space, cultures, explicitly or implicitly, enter dialogue with one another. As objects that provide a visible "performative dimension" their aura is acted out, tangibly, for all to witness (Were, 2014, 141). The back and forth conversation, sometimes hidden in clicks and searches, sometimes visible in comments or collections management systems, remains an influencing factor in each culture's memory formation and

its translation across cultures. As Hogsden and Poulter contend, these reciprocal networked encounters can "act practically and heuristically to establish new and contexts for understanding objects, and through them, ourselves" (2012, 267). Thus, at the very least, the museum and its digital collections offer us the opportunity to interrogate this phenomenon, its reception and its propensity for exacting change upon museum and visitor.

It is also here that we find the value of the digital museum object, a fact that emphasises the need to recast traditional notions of materiality, authenticity and aura that traditionally detract from it. Digital museum objects, and collections, must be liberated from such hierarchical structures in order for museum professionals, and thus visitors, to appreciate their true value. The cultural sector, however, must also be conscious of ascribing value that is not yet fully realised in terms of democratisation of

access and subsequent multivocal interpretation, and work concertedly towards achieving this.

CONCLUSION: CONTINGENT MATERIALITY, AURA AND VALUE

There remains no single definition of the digital museum object. Responses to survey and interview questions have demonstrated diverging, but not necessarily contradictory, conceptualisations of this type of object. In part, this is stems from disagreement around the qualities a digital object may possess, primarily materiality and aura. Deeper analysis of survey data shows this often to be contingent upon the role occupied by the museum professional and thus the capacity in which they are collecting, interpreting and displaying digital collections. The consequences of this are felt most acutely in relation to the value(s) ascribed to digital museum objects. Yet, by placing digital objects in lower positions in hierarchies of value, their potential is fundamentally limited. Liberating digital museum objects from these binaries, as shown by the USHMM's Some Were Neighbours exhibition and the Smithsonian's now articulated 3D woolly mammoth skeleton, leads to new and innovative uses, democratisation of knowledge and thus, democratisation of wider transcultural memory formation.

As custodians of institutions that are responsible for preserving and thus codifying memory, museum professionals occupy a privileged and powerful position. In order to achieve a faithful reflection of this sometimes diverse, contradictory or even divergent global memory, digital museum objects should be viewed, collected and displayed as polyvocal entities. As one curator noted, *"these museum objects have the ability to change the way that we understand social and transcultural memory because we are working now across borders. Borders [between] museums, and international borders."*

NOTES

1. A somewhat unifying language surrounding digital object is the designation Digital Object Identifier (DOI), a series of numbers, periods and forward slashes, assigned permanently to a piece of digital content (image, text, audio etc.). Many also use terms including digital object architecture, digital object memory and digital object storage but few attempt to define this fundamental constituent of their moniker.

2. Europeana. 'Glossary of Terms'. Europeana, 15 January 2015. /resources/standardization-tools/glossary.

3. NDSA. 'Glossary'. National Digital Stewardship Alliance - Digital Library Federation, 2013. http://ndsa.org//glossary/.

4. A set of 9 open-ended and non-leading questions were put to three museum professionals during semi-structured interviews lasting between 20 minutes to 1 hour. Interviewees were located in two geographically distinct locations, Washington D.C. and Scotland. Further quantitative and qualitative data was generated via an online survey. Questions included in this were developed with the aim of contextualising and complementing responses to those posed in the face-to-face interviews. The non-probabilistic self-selecting web-based survey was administered through Qualtrics. The survey was circulated primarily through email listservs (Jiscmail) and social media. Over a period of 15 days, the survey was received by a maximum of 10,754 recipients. Although all efforts were made to reduce potential bias in the sample, those who could be described as working primarily with digital objects i.e. in digital media, content generation and curation, are over-represented, perhaps given their greater familiarity with the subject.

5. This echoes the findings of Foster and Jones in their ethnographical study of the replica of St John's Cross standing in the graveyard of St

Columba's abbey on the island of Iona. Despite the fact that this stone carved cross is a replica, interviewees highlighted "the importance of patina derived from weathering, decay and the growth of lichen" in adding a sense of age and authenticity – something that the digital object cannot hope to achieve.

6. The online version of the Some Were Neighbors exhibition can be viewed on the United States Holocaust Memorial Museum's website: http://somewereneighbors.ushmm.org/

7. See: Selfe, Cynthia L., and Richard J. Selfe. "The Politics of the Interface: Power and Its Exercise in Electronic Contact Zones." *College Composition and Communication* 45, no. 4 (1994): 480–504. "Computer interfaces, for example, are also sites within which the ideological and material legacies of racism, sexism, and colonialism are continuously written and re-written along with more positive cultural legacies." (p484)

8. Smithsonian Digitization Project Office. 'Project Play'. Smithsonian Digitization | 3D, 2018. https://play.autodesk.com/pub/si-si-default-v5?cid=5531012.

9. Indeed, Maurizio Peleggi contends that Benjamin's prophecy remains unfulfilled, "since replication (now also digital) has clearly preserved and even magnified, not withered as he predicted, their aura." Peleggi, Maurizio. The Unbearable Impermanence of Things. Routledge Handbooks Online, 2011. www.routledgehandbooks.com, https://doi.org/10.4324/9780203156001.ch3.p.61

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