Chiara Zuanni

# Heritage in a digital world

## Algorithms, data, and future value generation

ENGLISH

ABSTRACT

This paper aims to examine the values of born-digital heritage. It focuses on the impact on museum and heritage practices of digital data as constituting heritage objects. Digital technologies are now deeply entangled with human communication and social relations. If heritage is socially constructed in the interactions between humans and objects and places, how do the algorithms that shape human experiences of it affect the production of heritage values? The characteristics of each online platform, from websites to social networking sites, influence the way heritage is constructed, discussed, and valued in online interactions. This paper will therefore first unpack the construction of heritage knowledge in the digital sphere, by analysing – with the support of posthumanist approaches – the entanglement of human and technological processes that shape the production of contemporary heritage. Secondly, the paper will explore how big data and algorithms challenge boundaries in the heritage field, such as those between representation and simulation. The paper will question the role of these non-human actors in shaping contemporary heritage production and values. Finally, the paper will discuss how born-digital heritage is archived, analysed, preserved, retrieved and represented in digital collecting projects. The paper will argue that these interactions have consequences both on the production of new social values in relation to heritage artefacts and on the construction of new 21st century heritage. By exploring the application of posthumanism to digital heritage, this paper will consider emerging borders within cultural and digital heritage, and how heritage values and practices are affected by these developments.

DEUTSCH

*Der Beitrag fragt nach dem Wert genuin digitalen Erbes, insbesondere nach dem Einfluss digitaler Daten als Erbobjekte auf Museumspraktiken und Praktiken zur Erhaltung des Erbes. Digitale Technologien sind heutzutage zutiefst in menschliche Kommunikation und Sozialbeziehungen eingebettet. Wenn nun Erbe als Sozialkonstrukt betrachtet wird, das in der Interaktion von Menschen mit Objekten und Orten entsteht, stellt sich die Frage, wie die Algorithmen, die diese menschliche Erfahrung mitgestalten, auch den Wert dieses Erbes beeinflussen. Die Charakteristika der Online-Plattformen, von Webseiten bis zu sozialen Medien, prägen die Art und Weise, wie Erbe in Online-Interaktionen konstruiert, diskutiert und gewertet wird. Der Beitrag untersucht daher zunächst die Wissenskonstruktion über Erbe in der digitalen Welt, indem mit Bezug auf posthumanistische Ansätze das Ineinander menschlicher und technologischer Prozesse, die die Produktion zeitgenössischen Erbes bestimmen, analysiert wird. In einem zweiten Schritt wird eruiert, inwiefern Big Data und die Anwendung von Algorithmen Grenzziehungen im Bereich von Erbkonzepten unsicher machen, etwa die Grenze zwischen Repräsentation und Simulation. Dabei will der Beitrag die Rolle dieser nicht-menschlichen Akteure in der Produktion zeitgenössisches Erbes und seiner Wertzuschreibung hinterfragen. Abschließend werden die Möglichkeiten der Archivierung, Analyse, Erhaltung, Wiederherstellung und Präsentation genuin digitalen Erbes als Teil digitaler Sammlungsprojekte thematisiert. Es wird argumentiert, dass derartige Interaktionen sowohl die Generierung neuer sozialer Werte bezüglich bestehender Artefakte als auch die Konstruktion neuen Erbes im 21. Jahrhundert beeinflussen. Durch das Einbeziehen posthumanistischer Ansätze auf digitales Erbe werden neue Grenzen zwischen kulturellem und digitalem Erbe wie auch die Auswirkungen der aktuellen Entwicklungen erkennbar.*

## BIOGRAPHY

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## KEY WORDS

contemporary collecting; Critical Heritage Studies; digital heritage; museums; posthumanism; social media

## Introduction

This paper aims to introduce posthumanism theories in digital heritage research. It will question the role of human and non-human agents in constructing heritage knowledge in the digital sphere and in constituting the digital sphere itself as an heritage object. In doing so, the paper will draw on posthumanism theory and on current research on developing and analysing digital engagement; the communication, mediation, and creation of heritage knowledge and values in the digital public sphere; and the discourses of authenticity and agency in relation to digital reproductions and objects.

The first section of this paper aims to briefly introduce *Critical Heritage Studies*, with an emphasis on the development of this field from the perspective of archaeology and museology. "Heritage" will be defined as an intangible process in the present, in which knowledge and values are ascribed to the remains of the past, the natural environment, and cultural practices. Subsequently, the concept of "digital heritage" will be introduced, leading to a section reviewing the evolution of digital methods in the heritage sector and discussing the understanding of heritage and cultural audiences and their experiences in the digital sphere. It will be argued that activities on digital media do not only offer the possibility of observing the construction and circulation of heritage knowledge online, but they also represent precious documentation of contemporary heritage. The following two sections will unpack the interaction of human and non-human agents in shaping users' online experiences, and the role of platform structures as posthuman assemblages. It will be argued that the temporary encounters of technological affordances and users' own identities and practices lead to the formation of heritage knowledge in complex networks. The discussion will suggest that these platforms are themselves worthy of consideration as heritage objects. In this context, the emergence and growth of born-digital collections in the heritage sector has started to reveal some of the challenges for professionals curating such assemblages, and the paper will suggest possible future work to address these issues.

In short, the paper is situated across *Critical Heritage Studies*, digital heritage, and museology, and aims to summarise current challenges in working with platforms to disseminate, examine, and preserve contemporary heritage. The use of posthuman frameworks is therefore suggested as a way to disentangle and productively investigate the role of technology and human agency in shaping current heritage-making processes and practices.

### The emergence and context of *Critical Heritage Studies*

The idea of a cultural and a natural heritage culminated in the 1972 UNESCO *Convention for the Protection of World Heritage*. In the 1970s and 1980s, most scholarly focus was on the management and preservation of this heritage, as well as on the leisure industries associated with these heritage sites. However, since the 1980s, new theoretical frameworks, a renewed attention on the public sphere, and parallel disciplinary developments led to the emergence of the broader research area of *Critical Heritage Studies* in the 2010s.

Post-modernism and post-colonialism theories had an in-depth impact on the emergence of public archaeology and heritage studies.

The influence of post-modernism and post-colonialism theories became prevalent during the 1980s and had an in-depth impact on the development of archaeological and museological theories, as well as the emergence of public archaeology and heritage studies. Post-processualism broke from previous traditions which aimed to find an historical objective truth through archaeology and highlighted how meanings were not inherent to material culture, but rather constructed in the present through the act of interpreting such material culture; as one of the key scholars of post-processualism, Tilley, emphasised: "The meaning of the past does not reside in the past, but belongs in the present" (Tilley 2001 [1989], 192). Therefore, it was argued that "[t]he process of writing the past in the present needs to become part of that which is to be understood in archaeology" (Tilley 2001 [1989], 192). Post-processual archaeologies introduced new theoretical frameworks in the study of material culture, which, it was argued, raised the same questions both towards past societies and our contemporary ones:

> *"The concern is to understand the conventions and operations by means of which material culture, conceived as a significative practice, produces meaning effects in relation to the social. We attempt to identify the effects significative meaning has on its observers and readers, both in the past and the present"* (Tilley 1993, 5).

Therefore, on one side, the connections between material culture and contemporary archaeological practices became a focus of post-processual ar-

chaeologists.[1] On the other side, archaeological work was redefined as aiming to understand "the past in social terms" (Tilley 1993, 4), leading to also suggest that this

> *"emphasis on polysemy and material culture as a multivocal code breaks down the very possibility of the archaeologist legislating once and for all on the meaning of the past and opens out the possibility for new forms of understanding"* (Tilley 1993, 4).

In museum studies, since the late 1980s, the work of Michel Foucault, post-colonialist critique, and Pierre Bourdieu prompted also a sound review of museums' social and political role. Foucauldian approaches to the history of the museum (Hooper-Greenhill 1992; Bennett 1995) evidenced the role museums have performed in sustaining and promoting the ruling power, firstly with post-Renaissance princes and monarchs, and then within the modern state, where they have become one of those regulating institutions criticised by Foucault. The contribution of Bourdieu rediscovered in the early 1990s (1984; 1991) emphasised how museums are strongly rooted into a Western bourgeois' ideology and represent a culture that not everyone could appreciate, given everyone's different cultural capital. Post-modern critiques suggested that museums' narratives were responding only to a part of the society, calling for more self-reflexivity in museum practices (Vergo 1989); while, post-colonial studies discussed further the role of museums in shaping the identity of modern nations (Anderson 1991). The influence of social sciences and media studies prompted also a reconsideration of museum audiences, which Karp delineated in 1992, writing that

> *"the best way to think about the changing relationship between museums and communities is to think about how the audience, a passive entity, becomes the community, an active agent"* (Karp et al. 1992, 12).

During the 1980s and 1990s, this increased attention to the publics of heritage led also to examine and theorise the presence of the past in the public sphere. The work of David Lowenthal (1985; 1998) contributed to the foundation of what will become the field of heritage studies, while Raphael Samuel (1994; 1998) emphasised the role of the historical past in the present, contributing to the growth of public history. In parallel, public archaeology also emerged as an academic discipline (Merriman 1991; Ascherson 2000; Schadla-Hall 1999; Merriman 2004), concerned with the multiple relationships between publics and archaeology in the public sphere (in

1 These relations were discussed by Ian Hodder (1982; 1991; 1999), Michael Shanks, and Christopher Tilley (Shanks/Tilley 1992; Shanks, 1992; Tilley 1993; Shanks 2012).

communication, education, museums, and opening-up participation in the archaeological process through e. g. community archaeology).

The recognition that the past is being written in the present, the importance of understanding the uses of the past in the present, and the consciousness that museums were not neutral displays form the background of heritage studies.

The recognition that the past is being written in the present, through its interpretation and management processes; the acknowledgement of the importance of understanding the uses of the past in the present; and the consciousness that museums were not neutral displays are all motives forming the background of the field of heritage studies. A foundational text, *Uses of the Past*, by Laurajane Smith (2006) argued how "heritage is used to construct, reconstruct and negotiate a range of identities and social and cultural values and meanings in the present" (Smith 2006, 3). The "official" discourse of heritage creates and shapes a series of socio-political practices: this is called the *Authorised Heritage Discourse* (AHD) and it embeds and projects existing relationships of powers onto material culture. In 2010, the *Association of Critical Heritage Studies* was founded, and at its first conference in 2012, in Gothenburg, launched a *Manifesto* which argued that

> *"The study of heritage has historically been dominated by Western, predominantly European, experts in archaeology, history, architecture and art history. Though there have been progressive currents in these disciplines they sustain a limited idea of what heritage is and how it should be studied and managed. The old way of looking at heritage – the Authorised Heritage Discourse – privileges old, grand, prestigious, expert approved sites, buildings and artefacts that sustain Western narratives of nation, class and science"* (ACHS 2012).

*Critical Heritage Studies* is therefore a practice about the present, that understand "heritage" as "constantly chosen, recreated and renegotiated in the present" (Harrison 2013, 65), and the focus is therefore on the intangible processes negotiating "heritage" (Harrison 2010). The field has deconstructed the distinction between natural and cultural heritage (Harrison 2015), it has remarked how heritage values are defined in the present, and – in doing so – it has deconstructed the Western social and political influence in creating the *Authorised Heritage Discourse* and has called for an understanding of values and forms of knowledge beyond the AHD. Herit-

age is therefore considered the negotiation and the result of an intangible process in the present, in which values are ascribed to material and immaterial cultural and natural features, with the aim of preserving and managing them for the benefit of future generations. It includes practice-oriented aspects (e. g. conservation, heritage management, tourism, museum practice) and a theoretical reflection on the cultural, social, and political implications of "heritage". More recently, Colin Sterling has examined the potential and risks that the use of posthuman theories entails for *Critical Heritage Studies*, concluding that critical posthumanism could offer productive provocations for heritage research (Sterling 2020). In short, the field of *Critical Heritage Studies* has emerged in the last decade as a productive area for interdisciplinary work questioning relationships between materialities, cultures, environments, pasts, presents, and futures.

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In parallel to these developments, digital heritage has also emerged both as a research field concerned with the impact of digital technologies on heritage practices, as it will be discussed in the next section, and as the heritage produced in digital format. Indeed, a large part of contemporary culture is born-digital, through the platforms and media that circulate information in the digital sphere in various formats (such as texts, databases, images, videos, etc.). UNESCO highlighted the need of preserving this heterogenous digital heritage already in 2003, in the *Charter on the Preservation of the Digital Heritage* – and the explosion of participatory platforms and social networks in the last decade has further highlighted the challenges of dealing with this material in archives and museums, as it will be discussed in a later section.

I define „digital heritage" as any information and data exchanged in a born-digital form.

This paper will draw on *Critical Heritage Studies* to discuss the configuration of digital heritage as part of a posthuman heritage. For the purposes of this paper, I define "digital heritage" as any information and data exchanged in a born-digital form: for example, this can be constituted by a single document or website, by an app, or by social media post(s). The following sections will first discuss how digital media enables new conversa-

tions around, and interpretation of heritage. While there is a need for more research on how knowledge is constructed online, I would also argue that there is also a need of preserving these snapshots in contemporary discourses about heritage. Therefore, this section will lead to a discussion of the role of platforms, considered as posthuman agents, in informing these discourses through their algorithmic structures. The last section will consequently move to observe how we can preserve not only short fragments of these conversations, but also the platforms, algorithms, and tools that enable them – all contributing to the network of human and non-human agents shaping our understanding of the past, present, and future.

## Constructing heritage knowledge online

The previous section has argued that the recognition of the influence of contemporary social and political structures on archaeological and museological interpretation, as well as on the understanding of the past in the public sphere, has shaped the field of heritage studies (and neighbouring fields) in the last decades. In this same period, the digital transformation has affected the way heritage is communicated, negotiated, and understood in the public sphere. The communication of the past in the digital sphere has been at the forefront of research in both digital public archaeology (Bonacchi 2012; Richardson 2013) and museums (e. g. Sanchez Laws 2015) for more than a decade. If the documentation of cultural and natural heritage collections had prompted the adoption of digital methods in museums already at the end of the 1960s, it was the advent of the *World Wide Web* and personal computers which – as in any other sector – contributed to the development new solutions. The first museum websites started to appear in the early 1990s (e. g. *Natural History Museum London* in 1994), in parallel to digital supports (e. g. CD-ROMs) which offered an alternative to the traditional museum guide, with a presentation of the collections and, at times, more interactive presentations. In the 2000s, the beginning of the use of semantic web technologies for cultural heritage collections and a broader diffusion of websites was followed by the explosion of the *Web 2.0*, which – in turn – led to the development of participatory practices (Jenkins 2006). Nina Simon theorised the participatory museum as a place where everyone is enabled to participate and to contribute information and a perspective (Simon 2010). Digital media enable such participatory practices, from crowdsourcing projects to showcasing multiple interpretation of an

object or theme, to the conversations and community-building aspects of social media platforms. Researchers have explored ways of collecting, analysing, and evaluating participatory practices and digital engagement (e. g. in the case of social media, cf. Giaccardi 2012; Villaespesa 2013; Villaespesa 2015; Zuanni 2017b), and it has been argued that user responses to museum objects can constitute "unintended collaborations" expanding an object's life into the digital sphere (Zuanni 2017a).

If in the early 2010s there was an enthusiasm for the possibilities of digital engagement, through social media communications, storytelling, gamification, and participatory practices, during the last decade, less naïve and more critical perspectives on these digital approaches have emerged. On the one hand, the difficulties of developing significant and successful digital engagement have become clearer, as well as the need of understanding the respective roles and boundaries of marketing, education, and engagement. On the other hand, museums are inevitably entangled in the controversies and politics of the *Web 2.0*: coherency and consistency with their mission as well as a duty of care towards their staff and their audiences is therefore paramount for the future development of their digital engagement strategies. Thus, there is an increasing attention on the ethical aspects of working with heritage audiences data (Kidd/Cardiff 2017; Richardson 2018), as well as the positioning and use of heritage content in the digital sphere.

While there is a broad literature framing the experiences of heritage audiences offline, there is not yet a comparable understanding of online experiences.

Similarly, while there is a broad and growing literature framing the experiences and understanding of heritage audiences offline, there is not yet a comparable understanding of online experiences. In museum and heritage audience research, from a theoretical perspective, scholars have been concerned with the understanding of museum learning, meaning-making, and experiences. Constructive approaches and qualitative methods have been widely explored since the late 1990s. For example, Falk and Dierking explored visitors' experiences in museums and meaning-making processes (1992; 1995; 2000; 2007; 2009; 2013). They suggested a "contextual model of learning", recognizing that

> *"learning is influenced by three overlapping contexts: the personal, the sociocultural, and the physical. Learning can be conceptualized as the integration and interaction of these three contexts"* (Falk/Dierking 2000, 13).

The personal context includes "the visitor's prior knowledge, experience and interest"; the physical context involves "the specifics of the exhibitions, programs, objects, and labels they encounter"; the socio-cultural context involves "the within- and between- group interactions that occur while in the museum and the visitor's cultural experiences and values" (Falk 2009, 159). The theory was subsequently refined by Falk, emphasising the role of identity-related needs and interests in constructing a museum experience (Falk 2009; 2013).

In a more practice-oriented approach to audience research, segmentation methods are used to understand the composition, motivation, and socio-economic framing of visitors. One such segmentation is for example "Culture Segments", developed by Morris Hargreaves McIntyre, which supports surveys of cultural audiences in a range of venues and contexts and offers insights into their cultural consumption practices. A category in such segmentation is, for example, the "enrichment" segment which comprises approximately 17 percent of adults and describes audiences with a strong interest for history and who can be targeted through an emphasis on an established tradition and a focus on nostalgia, and who tend to be loyal visitors, who can be part of membership schemes (Morris Hargreaves McIntyre [n. d.]). As mentioned, there is not yet a similar body of research for framing the experiences of online audiences, and there is thus a need for a better framing of online attitudes to heritage and consumption patterns.

Furthermore, posthumanist research frameworks have been used to unpack the role of technology in archaeological interpretation by Colleen Morgan, who drew on Donna Haraway's work to argue that "Cyborg Archaeology" would enable the expansion of boundaries in interpreting the past, opening up new creative approaches to the understanding of the past and the present (Morgan 2019). A recent special issue of the *European Journal of Archaeology* (Díaz-Guardamino/Morgan 2019) explored further a range of approaches to this cyborg archaeology, while there has not yet been a similar analysis of the entanglement of human and technological processes that shape the production of heritage knowledge in the public sphere. The following sections will start to discuss possible factors in such an analysis, drawing on posthumanism theory to unpack the construction of heritage in the digital sphere.

## The role of platforms in shaping online experiences

This section will highlight how the characteristics of online social networking platforms, on which heritage content is disseminated, discussed, and encountered by a variety of stakeholders and audiences, can be considered through the lenses of posthumanism in order to better understand the role of technology and the patterns of online navigation and consumption of heritage audiences. Cristina Alaimo and Jannis Kallinikos (2017) have highlighted how

> *"platform user engagement and networking are considered as being mediated, or plat-formed to deploy a neologism, by the conventions, design choices, and instrumentalities of social media technologies, and by the socioeconomic context in which social media qua organizations are operating"* (Alaimo/Kallinikos 2017, 175).

They defined as "encoding" the process by which social media platforms constrain the users in specific behavioural patterns and data production activities (e. g. sharing, liking, commenting, following, tagging, posting). I argue therefore that encountering heritage online implies a negotiation of "traditional" factors driving heritage audience research and the modes of encoding we participate in on social media platforms. In this sense, the formation and circulation of heritage knowledge in the digital sphere is the result of a complex network of interactions, which concern the identity and attitudes of the users as well as the infrastructures of the platforms. It is this entanglement of human and non-human actors that, ultimately, shapes our online experiences.

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On the one hand, social media users have diverse demographics and digital literacy backgrounds, which lead to different choices in regards of platforms, their account settings, and their use of these same platforms. For example, users of *Facebook*, *WeChat*, *VKontakte*, and *TikTok*, will likely belong to different geographic areas and age groups, and their communication styles and networks will shape their conversations and experiences. In these regards, an example of a previous analysis I carried out in 2013, in which it was emphasised how heritage-related news were differently con-

sumed on *Twitter* and on online media webpages could be recalled: in the case of a viral museum video, most *Twitter* users shared articles by the *BBC*, the *Independent*, and *CNN*, with only 91 users tweeting the relevant article by the *Daily Mail* (which contained less correct information); conversely, though, the *Daily Mail* article proved to be the most commented on on the newspaper website, with 1280 comments (Zuanni 2017a). I argued therefore for "the importance of including in the analysis data from different platforms, in order to gather perceptions and opinions on the event from a wider population" (Zuanni 2017a). Netnographic methods (Kozinets 2010) or digital ethnographies (Pink et al. 2016) have been proposed as a solution to gain a more in-depth qualitative understanding of online experiences and knowledge processes.

## The structure of platforms also affects the way information is circulated, aggregated and consumed.

On the other hand, the structure of the platforms also conditions the modes of communication, e. g. the 280-characters limit on *Twitter*, thus affecting the way information is circulated (through text, images, audio, or videos); aggregated (e. g. through hashtags or playlists); and consumed (how algorithms serve different content to different users). A famous example of how the platform algorithms shape the content we see and thus might influence our reactions to specific issues is represented by *Cambridge Analytica* and successive analyses of the Brexit vote and the 2016 US elections. In this sense, the fact that these systems are often so-called "black-boxes" also challenges our possibility of fully understanding their functioning, and thus researching more precisely their impact on users' knowledge.

Finally, the rapid changes of the platforms in parallel with the need to better understand the ethics of collecting and preserving this material pose numerous challenges to both research and cultural institutions. On the one hand, there are social media APIs (Application Programming Interfaces), which in the last few years have notably restricted access for researchers (Bruns 2019); on the other hand, it is yet unclear how to best negotiate access to the data and manage it in relation to the platforms' *Terms and Conditions*, personal data protection and copyright legislation, and heritage ethics. For example, in the case of *Facebook*, access to the APIs in order to search and collect posts has been restricted after the *Cambridge Analytica* scandal; at the same time, there is an ethical duty of care towards users who might have different levels of digital literacy, and consequently might not

be aware of the differences in posting on a personal profile rather than on a public group. While different levels of attention to privacy settings and awareness of the implications of posting on public pages lead to different usage patterns of the platforms, they may also end up offering an unbalanced and biased view of opinions on a matter to a viewer.
In short, the "encoding" process highlighted by Alaimo and Kallinikos affects not only the users, but also the data that researchers and cultural institutions have access to. Any collection of data therefore needs to account for the role these infrastructures, and the socio-political contexts in which these platforms have been developed, play in shaping the results. It is in this context, that I suggest the idea of interaction, as defined by Karen Barad, to understand the emergence of new configurations of knowledge. Barad writes that

> *"It is through specific agential intra-actions that the boundaries and properties of the 'components' of phenomena become determinate and that particular embodied concepts become meaningful"* (Barad 2003, 815).

In the context of heritage-making in the digital sphere, where conversations on social media, both initiated by heritage professionals or by interested users (who might have other agendas), it is valuable to research both the content and contexts of these exchanges and, crucially, the affordances of the platforms on which they happen. In this sense, digital ethnographers and data-intensive methods can be fruitfully combined with software and platforms studies (Burgess et al. 2017) in order to contextualise this data within ephemeral and temporary assemblages of human behaviours and technological constraints.

The results of any research are intrinsically linked to the entanglements of the research practice.

It could therefore be argued that the results of each online conversation or search about a heritage topic could constitute a contemporary version of the *Mnemosyne Atlas* envisioned by Aby Warburg, and – as such – represent an invaluable witness of contemporary knowledge, cultures, and histories. Furthermore, Barad's argument that the separation of epistemology and ontology needs to be overcome (Barad 2007, 185), since the results of any research are intrinsically linked to the entanglements of the research

practice, also seems apt for social media research, in which platform algorithms and the choice of digital methods shape what we can see of the structure, the data that is available and possible to collect, and the way we as researchers can interact with it.
Donna Haraway, in *A Cyborg Manifesto*, suggests that communication sciences (and biology) are engaged in a

> *"translation of the world into a problem of coding, a search for a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment, and exchange"* (Haraway 1990 [1985], 302).

The dilution of boundaries proposed by the cyborg theory enlightens the process of digital knowledge-making, in which new heritage values are formed from reassembling an heterogeneity of sources and online practices. As previously mentioned, it has been productively used by Morgan (2019) in relation to archaeological digital practice. However, this dilution and the shift from representation to simulation, the first dichotomy mentioned by Haraway (1990 [1985], 300), emphasises also the risks of exploitation of heritage in the digital sphere, in which algorithms that can mimic social interactions and connect internet users can affect online experiences. At a simple level, we can just think of social media bots, which can easily be used to circulate information to users, serving specific agendas.

## The predominance of the *Authorised Heritage Discourse* needs to be counterbalanced by a more inclusive approach to heritage-making.

As it has been argued in a previous section, both archaeological theory and *Critical Heritage Studies* have moved to recognise that heritage-making processes happen in the present, and the predominance of the *Authorised Heritage Discourse* needs to be counterbalanced by a more open and inclusive approach to heritage-making. However, there is a long history of debates on the public understanding and uses of the past, which has highlighted how heritage practitioners need to be alert to the misuses and abuses of the past for political agendas, e. g. white supremacy or nationalistic movements. In this sense, the emergence of simulation in Haraway, as well as in Baudrillard (1994) and in Eco's hyperreality (1998), requires further attention to the cyborgs and their impact on heritage discourses in the public sphere, so as to support inclusive and participatory translation of herit-

age in this sphere, while paying attention to the appropriation of heritage content by socio-political movements. This is a challenge that has not yet been addressed by the sector, although the urgency of raising awareness of the uses and contexts of social media has been repeatedly emphasised (e. g. Richardson 2018).

### Digital objects as posthuman heritage

This section will depart from a discussion of platforms as places for knowledge-making to shift the attention to platforms as heritage objects. The *Web 2.0* has also completely reshaped the way we create and constitute memories of our personal lives and of our society. In the *Internet of Things* and social media age, memories are made, constructed, and memorialized online (Giaccardi 2016), and it has been argued that everyone is now a curator, curating their online persona, memories, interests. This section will ask what it therefore means to preserve contemporary heritage in the digital age.

Museums have been slow to include social media and digital culture objects in their collections.

The recognition of born-digital material as an object of archiving and musealisation practices has a longer history in the library and archives sector, in particular in relation to web archiving and digital asset management practices. In the museum sector, expertise in dealing with this material has been developed in particular for collections of digital art (Paul 2015; 2017) and in science museums and museums of technology, where there is a longer tradition of collecting computers and technological artefacts (Foti 2018); more recently these objects have also been included in design museums. Examples include technologies such as the *iPod* (Smithsonian 2008), the *iPhone* (V&A 2015), video games (the first collection having been started by MoMA in 2012). Despite growing attention to social media engagement, museums have been slow to include social media and digital culture objects in their collections. A notable exception is New York's *Museum of the Moving Image*, which has been collecting and exhibiting GIFs since 2014. Temporary exhibitions have included social media walls, i. e. screens showing social media streams in real-time. A similar installation at the *Museum of London* in 2016, called "Pulse" was used to show how *Twitter* represented

the life of the city, thus moving from being purely an engaging visualisation of visitors' experiences in the museum (as many social media walls tend to be) to suggest a real-life recording of contemporary life in the city hosting the museum. In 2017, the V&A acquired a local copy of the Chinese social media platform *WeChat*, while between 2017 and 2020, the "Collecting Social Photography" project by a group of Scandinavian museums, drew on a series of crowdsourcing experiments aimed at capturing everyday mobile images of specific areas of a city or on a theme (Hartig [n. d.]). Other museums, despite demonstrating interest in social media and other digital cultural objects (e. g. memes), have not yet established collections, mainly due to the challenges they encounter in acquiring, curating, and exhibiting such objects. These technologies are also objects of interest for archaeologists, who encounter them as part of the material culture of the Anthropocene (Beale/Schofield/Austin 2018). For example, a USB stick found in an excavation in London in 2012 was subsequently acquired by the *Pitt Rivers Museum* in Oxford (Accession number: 2016.47.1, Moshenska 2014), where it is now on display.

## Can digital objects develop their own "aura" and agency?

A first characteristic of digital objects is that they can emerge as reproductions of existing heritage objects, for example in digitising projects. In this context, also the discussion on simulation as a potential risk in the online circulation of heritage knowledge and values, need to be reframed in relation to digital objects. The discussion on the relation between the ontological status of a digital object and its physical counterparts has a long history. Many discussions go back to Benjamin, who argued that "even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be" (Benjamin 2006 [1935]). The lack of this presence, of the "aura" of an object, constitutes a major challenge to its authenticity, and ultimately its authority (Benjamin 2006 [1935]). Much has been written on this topic since Benjamin, also in relation to digital objects. In 2007, Fiona Cameron argued that digital objects could "potentially be seen as objects in their own right" (Cameron 2007, 54), suggesting the possibility that they could develop their own aura and agency. Drawing on Benjamin, Latour and Lowe (2010) argued that the aura could actually migrate. Their argument was that good "facsimiles" would allow visitors to experience the work of art in a way that the original might not enable anymore, as in the case of Ve-

ronese's painting *Nozze di Cana*, whose high-quality replica in its original location, the refectory of San Giorgio (Venice), allows an experience that is now completely lost in front of the original at the *Louvre*. Drawing on their work, Stuart Jeffrey (2015) argued that moving beyond the technicalities and working with communities could open up new ways of addressing values and experiences of authenticity. The ACCORD (*Archaeological Community Co-Production of Research Resources*) project examined how co-design and co-production using digital methods affected the relationships between communities, 3D models of heritage, and authenticity (Jeffrey 2015; Maxwell 2017). The ethnographic research in the project led to the argument that, although digital models lack the sensory qualities of heritage artefacts, they allow "new ways of seeing and experiencing" the object (Jones et al. 2018, 345) and the creation of new sets of relationships with the original, which suggest "a partial if limited migration of aura" (Jones et al. 2018, 349). Furthermore, the making of 3D models is in itself a creative process, informed by the identity and intention of their creators, and as such "3D models also acquire new forms of authenticity", authority and aura "in relation to the networks of relations involved in their production" (Jones et al. 2018, 349). The key conclusion emerging from an ethnography of the ACCORD project was therefore that "a pre-occupation with the virtual object – and the binary question of whether it is or is not authentic – obscures the wider work that digital objects do" (Jones et al. 2018, 350).

## Digital objects exist as assemblages of physical and digital components, tangible and apparently intangible features.

A second characteristic of these objects is their existence as assemblages of physical and digital components, tangible and apparently intangible features. These objects are assemblages of hardware, software, and digital networks that define a new form of experiencing and sharing lives, emotions, and knowledge. Jane Bennett has argued that "[a]n assemblage owes its agentic capacity to the vitality of the materialities that constitute it" (Bennett 2010, 34). Also social media platforms can be described as informed by interconnections of human users and non-human components, which influence each other, as argued also in the previous section. As Bennett reminds us,

*"Humanity and nonhumanity have always performed an intricate dance with each other. There was never a time when human agency was any-*

*thing other than an interfolding network of humanity and nonhumanity; today the mingling has become harder to ignore"* (Bennett 2010, 31).

The understanding of the agencies at play is not only crucial to frame the contexts of digital technologies, but it also affects the choice of preservation and curation methods. In digital preservation, software is preserved through migration or emulation. Migration entails the transformation of the data in a format comprehensible to a contemporary software and hardware; emulation is instead the reproduction of the behaviours of an obsolete system on a contemporary system, thus enabling the use of old software. In both these cases, however, aspects of the "dance" between human and non-human components are getting lost: for example, an arcade game, if migrated, will likely have a different resolution and different commands; conversely, if emulated, it will lose aspects of the original experience anyway, e. g. the "surprise" and "innovation" a gamer could have admired only ten years ago, but which in comparison to contemporary technology lose their appeal. A better understanding of the vital materialism (Bennett 2010) and intra-actions (Barad 2007) shaping digital experiences would therefore support more robust approaches to the understanding of the heritage values of these digital objects.

## The selection of digital cultures to be represented in a museum is deeply embedded in local, national, cultural and social structures.

If the above characteristics of digital objects affect their definition and understanding as heritage, other aspects offer real and still unresolved challenged to heritage professionals curating this material. Since museums are not neutral, the selection of digital cultures to represent in them is also deeply embedded in local, national, cultural and social structures. As argued above, different social media platforms have different worldwide, age, and gender uptakes (e. g. *Facebook*, *Weibo*, *VK*, etc.) and people might perform different identities on each platform they join. In addition, ethics and legal frameworks differ across countries and thus access to, and use of, the data should be modulated against these frameworks while maintaining the aim of representing contemporary societies in a balanced and transparent way. I mentioned how the V&A collected a local copy of the Chinese social network *WeChat* for its design collection: however, the museum then chose to create new fictitious users, so as to protect the privacy of actual users of the platform while demonstrating the range of interactions this

enables. Conversely, the *Collecting Social Photo* project and the *Museum of Transports* in London instead used crowdsourcing methods to collect social media content to guarantee users' privacy being respected, allowing them to share content only if they are comfortable with this. However, if museums aim to document current society and history, they might need to foster wider collecting initiatives, since it would otherwise be difficult to understand current political events without a broader picture of social media discussions (e. g. on Brexit or on Trump's politics). A different legal problem is constituted by the infinite replicability of codes, which poses a challenge in justifying the ownership of these collections. In these regards, digital art museums have a longer experience in the policies of managing born-digital content, e. g. when loaning it for temporary exhibitions. However, if the code of a digital artwork can be managed, the ownership of a social media post is more complicated: the rights of the user, of the platform, and – eventually – of the heritage institution collecting it are overlapping and contrasting in unresolved ways.

Curatorial choices on relevant material to access, record, and preserve are crucial for the development of sustainable collections of 21st century cultures.

The *Library of Congress*, in the US, has famously attempted to "collect Twitter": in collaboration with the platform, it acquired the database and set out to prepare it for long-term archival. However, it was soon overwhelmed by the quantity of this big data and the ethical implications, thus failing to complete the project. This points to a last difficulty for museums aiming to collect born-digital data: the size of this so-called "big data". Born digital content might be immaterial, but it still necessitates care and physical supports (starting with server space), and – in a so-called "big data" era – curatorial choices on relevant material to access, record, and preserve are crucial for the development of sustainable collections of 21st century cultures. As Morgan/Macdonald have argued (2018), museums are now facing a "profusion struggle": i. e. the need of curating and preserving constantly growing numbers of objects "forever". In a moment in which museums are therefore discussing deaccession and disposal strategies, so as to limit their collections to a manageable size, the collection of born-digital objects, which might constitute "big data", adds further stress if not rooted in a clear strategy.

## Conclusion

This paper has begun with a discussion of *Critical Heritage Studies* and the uses of technology in the heritage sector and it has subsequently unpacked the encounters of human and non-human actors in constructing heritage in the digital sphere, arguing that there is a need for developing digital preservation practices for both user-generated content and the platforms that enable its creation. On the one hand, these encounters lead to "intra-actions" (following Barad), which in turn create new heritage knowledge and values. More research is needed on the methods and ethics for examining user practices and platform "encoding" processes. In this context, I suggest that cyborg theory (following Haraway) applied to digital platforms could be a useful framework for developing an ethically aware and inclusive conversation around heritage.

In order to fully understand the values of digital heritage, it is necessary to reframe ideas of authenticity to also include the specific features of born-digital objects. Similarly, unpacking the agencies at play in digital heritage assemblages (following Bennett), and thus a better understanding of the entanglement of agencies in such objects, could lead to a more robust framing of their curatorial needs and legal contexts. Therefore, I suggest that posthuman theory approaches to digital heritage could open up new perspective for addressing current challenges in the digital collection, preservation, management, and display of born-digital objects. In these regards, the paper presents a partial and yet developing perspective, and it indicates possible directions for future research and further reflections.

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## References

ACHS – Association of Critical Heritage Studies (2012), Manifesto. https://www.critical-heritagestudies.org/history [05.06.2020].

Alaimo, C. / Kallinikos, J. (2017), Computing the everyday. Social media as data platforms, Information Society 33, 4, 175–191. DOI: 10.1080/01972243.2017.1318327.

Anderson, B. (1991), Imagined communities. Reflections on the origin and spread of nationalism, London: Verso.

Ascherson, N. (2000), Editorial, Public Archaeology 1, 1, 1–4.

Barad, K. (2003), Posthumanist Performativity. Toward an Understanding of How Matter Comes to Matter, Signs: Journal of Women in Culture and Society 28, 3, 801–831. DOI: 10.1086/345321.

Barad, K. (2007), Meeting the Universe Halfway. Quantum physics and the entanglement of matter and meaning, Durham: Duke Univ. Press.

Baudrillard, J. (1994), Simulacra and simulation, Ann Arbor: Univ. of Michigan Press.

Beale, G. / Schofield, J. / Austin, J. (2018), The Archaeology of the Digital Periphery. Computer Mice and the Archaeology of the Early Digital Era, Journal of Contemporary Archaeology 5, 2. DOI: 10.1558/jca.33422.

Benjamin, W. (2006), The work of art in the age of mechanical reproduction [1935], in: Morra, J. / Smith, M. (eds.), Visual Culture. Critical Concepts in Media and Cultural Studies, London: Routledge (Experiences in Visual Culture 4), 137–144.

Bennett, J. (2010), Vibrant matter. A political ecology of things, Durham, NC: Duke Univ. Press.

Bennett, T. (1995), The birth of the museum. History, theory, politics, London: Routledge.

Bonacchi, C. (2012), Archaeology and digital communication. Towards strategies of public engagement, London: Archetype Publ.

Bourdieu, P. (1984), Distinction. A social critique of the judgement of taste, London: Routledge.

Bourdieu, P. / Darbel, A. / Schnapper, D. (1991), The love of art. European art museums and their public, Cambridge: Polity.

Bruns, A. (2019), After the 'APIcalypse'. Social media platforms and their fight against critical scholarly research, Information, Communication & Society 22, 11, 1544–1566. DOI: 10.1080/1369118X.2019.1637447.

Burgess, J. et al. (2017), Platform studies. The rules of engagement, Association of Internet Researchers Annual Conference (AoIR 2016, October). https://eprints.qut.edu.au/107070/ [02.10.2020].

Cameron, F. (2007), Beyond the cult of the replicant. Museums and historical digital objects: Traditional concerns, new discourses, in: Cameron, F. / Kenderdine, S. (eds.), Theorizing Digital Cultural Heritage. A Critical Discourse, Cambridge, MA: MIT Press, 49–75.

Díaz-Guardamino, M. / Morgan, C. (2019), Human, Transhuman, Posthuman Digital Archaeologies. An Introduction, European Journal of Archaeology 22, 3, 320–323. DOI: 10.1017/eaa.2019.26.

Dierking, L. D. / Falk, J. H. (1995), Public institutions for personal learning. Establishing a research agenda, Washington, DC: American Association of Museums. Technical Information service.

Eco, U. (1998), Faith in fakes. Travels in hyperreality, London: Vintage.

Falk, J. H. (1992), The museum experience. Forword by Willard L. Boyd, ed. by L. D. Dierking, Washington, DC: Whalesback Books.

Falk, J. H. (2009), Identity and the museum visitor experience, Walnut Creek, Calif.: Left Coast Press.

Falk, J. H. / Dierking, L. D. (2000), Learning from museums. Visitor experiences and the making of meaning, Walnut Creek, CA/London: AltaMira Press.

Falk, J. H. / Dierking, L. D. / Foutz, S. (2007), In principle, in practice. Museums as learning institutions, Lanham: Altamira Press.

Falk, J. H. / Dierking, L. D. (2013), The museum experience, Washington, DC: Whalesback Books.

Foti, P. (2018), Collecting and Exhibiting Computer-Based Technology. Expert Curation at the Museums of the Smithsonian Institution, London: Routledge.

Giaccardi, E. (2012), Heritage and Social Media. Understanding heritage in a participatory culture, Hoboken: Routledge.

Giaccardi, E. (2016), How Memory Comes to Matter. From Social Media to the Internet of Things, in: Muntean, L. / Plate, L. / Smelik , A. (eds.), Materializing Memory in Art and Popular Culture, New York/London: Routledge, 65–88.

Haraway, D. (1990 [1985]), A manifesto for cyborgs. Science, technology, and socialist feminism in the 1980s, in: Nicholson, L. J. (ed.), Feminism/postmodernism, New York: Routledge, 190–233.

Harrison, R. (2010), Introduction, in: Harrison, R. (ed.), Understanding the politics of heritage, Manchester: Manchester Univ. Press, 5–42.

Harrison, R. (2013), Heritage. Critical approaches, New York: Routledge.

Harrison, R. (2015), Beyond "Natural" and "Cultural" Heritage. Toward an Ontological Politics of Heritage in the Age of Anthropocene, Heritage & Society 8, 1, 24–42. DOI: 10.1179/2159032X15Z.00000000036.

Hartig, K. (n. d.), Collecting social photo. http://collectingsocialphoto.nordiskamuseet.se/ [05.06.2020].

Hodder, I. (1982), Symbols in action. Ethnoarchaeological studies of material culture, Cambridge: Cambridge Univ. Press.

Hodder, I. (1991). Reading the past. Current approaches to interpretation in archaeology, Cambridge: Cambridge Univ. Press, 2nd ed.

Hodder, I. (1999), The archaeological process. An introduction, Oxford: Blackwell.

Hooper-Greenhill, E. (1992), Museums and the Shaping of Knowledge, London: Routledge.

Jeffrey, S. (2015), Challenging Heritage Visualisation. Beauty, Aura and Democratisation, Open Archaeology. DOI: 10.1515/opar-2015-0008.

Jenkins, H. (2006), Confronting the Challenges of Participatory Culture. Media Education for the 21st Century. https://www.macfound.org/media/article_pdfs/JENKINS_WHITE_PAPER.PDF [02.10.2020].

Jones, S. et al. (2018), 3D heritage visualisation and the negotiation of authenticity. The ACCORD project, International Journal of Heritage Studies 24, 4, 333–353. DOI: 10.1080/13527258.2017.1378905.

Karp, I. / Kreamer, C. M. / Lavine, S. D. (eds.) (1992), Museums and communities. The politics of public culture, Washington/London: Smithsonian Institution Press.

Kidd, J. / Cardiff, R. (2017), "A space of negotiation". Visitor Generated Content and Ethics at Tate, Museum and Society 15, 1, 43–55. DOI: 10.29311/mas.v15i1.661.

Latour, B. / Lowe, A. (2010), The migration of the aura or how to explore the original through its fac similes, Switching Codes, 275–297. http://www.bruno-latour.fr/sites/default/files/108-ADAM-FACSIMILES-GB.pdf [02.10.2020].

Lowenthal, D. (1985), The past is a foreign country, Cambridge: Cambridge Univ. Press.

Lowenthal, D. (1998), The heritage crusade and the spoils of history, Cambridge: Cambridge Univ. Press.

Maxwell, M. (2017), Power is in the Process. The ACCORD project, Internet Archaeology 44. DOI: 10.11141/ia.44.10.

Merriman, N. (1991), Beyond the glass case. The past, the heritage and the public in Britain, Leicester: Leicester Univ. Press.

Merriman, N. (2004), Public archaeology, London: Routledge.

Morgan, C. (2019), Avatars, Monsters, and Machines. A Cyborg Archaeology, European Journal of Archaeology 22, 3, 324–337. DOI: 10.1017/eaa.2019.22.

Morgan, J. / Macdonald, S. (2018), De-growing museum collections for new heritage futures, International Journal of Heritage Studies 26, 1, 56–70. DOI: 10.1080/13527258.2018.1530289.

Morris Hargreaves McIntyre [n. d.], Culture Segments. Enrichment. https://mhminsight.com/culture-segments/enrichment-pen-portrait-449 [30.05.2020].

Moshenska, G. (2014), The Archaeology of (Flash) Memory, Post-Medieval Archaeology 48, 1, 255–259. DOI: 10.1179/0079423614Z.00000000055.

Paul, C. (2015), Digital Art, London: Thames & Hudson.

Paul, C. (2017), From Archives to Collections, in: Grau, O. / Coones, W. / Rühse, V. (eds), Museum and Archive on the Move. Changing Cultural Institutions in the Digital Era, Berlin/Boston: De Gruyter, 184–197.

Pink, S. et al. (2016), Digital ethnography. Principles and practice, Los Angeles: SAGE.

Richardson, L. (2013), A Digital Public Archaeology?, Papers from the Institute of Archaeology 23, 1, Art. 10. DOI: 10.5334/pia.431.

Richardson, L. (2018), Ethical Challenges in Digital Public Archaeology, Journal of Computer Applications in Archaeology 1, 1, 64–73. DOI: 10.5334/jcaa.13.

Samuel, R. (1994), Theatres of memory. Vol.1: Past and present in contemporary culture, London: Verso.

Samuel, R. et al. (1998), Theatres of memory. Vol.2: Island stories. Unravelling Britain, London: Verso.

Sanchez Laws, A. L. (2015), Museum Websites and Social Media. Issues of Participation, Sustainability, Trust, and Diversity, New York/Oxford: Berghahn Books (Museums and Collections 8).

Schadla-Hall, T. (1999), Editorial. Public Archaeology, European Journal of Archaeology 2, 2, 147–158.

Shanks, M. (1992), Experiencing the past. On the character of archaeology, London: Routledge.

Shanks, M. (2012), The archaeological imagination, Walnut Creek, Calif.: Left Coast Press.

Shanks, M. / Tilley, C. (1992), Re-constructing archaeology. Theory and practice, London: Routledge, 2nd ed.

Simon, N. (2010), The participatory museum, Santa Cruz, Calif.: Museum 2.0.

Smith, L. (2006), Uses of heritage, London: Routledge.

Sterling, C. (2020), Critical heritage and the posthumanities. Problems and prospects, International Journal of Heritage Studies. DOI: 10.1080/13527258.2020.1715464.

Tilley, C. (1993), Interpretative archaeology, Providence/Oxford: Berg.

Tilley, C. (2001 [1989]), Interpreting material culture, in: Hodder, I. (ed.), The meanings of things, London: Routledge, 185–194.

Vergo, P. (ed.) (1989), The New museology, London: Reaktion.

Villaespesa, E. (2013), Diving into the museum's social media stream. Analysis of the visitor experience in 140 characters, in: Museums and the Web 2013, Portland. https://mw2013.museumsandtheweb.com/paper/diving-into-the-museums-social-media-stream/ [15.10.2020].

Villaespesa, E. (2015), Measuring Social Media Success. The value of the Balanced Scorecard as a tool for evaluation and strategic management in museums, University of Leicester, PhD Thesis. https://leicester.figshare.com/articles/Measuring_Social_Media_Success_The_value_of_the_Balanced_Scorecard_as_a_tool_for_evaluation_and_strategic_management_in_museums/10121681/1 [15.10.2020].

Zuanni, C. (2017a), Unintended Collaborations. Interpreting Archaeology on Social Media, Internet Archaeology 46. DOI: 10.11141/ia.46.2.

Zuanni, C. (2017b), Italian Museums and Twitter. An Analysis of Museum Week 2016, Archeostorie. Journal of Public Archaeology 1, 1. https://archeostoriejpa.eu/papers/2017_4c/ [02.10.2020].