

The Problem with Printing Palmyra: Exploring the Ethics of Using 3D Printing Technology to Reconstruct Heritage

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The use of 3D printing technology to reconstruct the Arch of Triumph in Palmyra has opened a Pandora's Box of ethical issues relating to the use of digital technology to preserve heritage represented by historical objects and sites. The author investigates the ethical implications of the three replicas of the arch made by IDA in New York, London, and Dubai after the original was destroyed in the Syrian Civil War. The ethics of digital reconstructions of heritage are not yet coded by UNESCO or ICOMOS, but it is important to hold reconstructed heritage to the same ethical expectations as other types of heritage. This paper concludes that the reconstructed arch failed to meet these expectations in four key ways. First, it does not address the human loss in Palmyra and the contribution of the Assad regime to its destruction. Second, despite an ostensible commitment to reproduction, the reconstructed arch is inaccurate in material and scale. Third, the arch is patented by the IDA and has had limited public and digital access. Finally, the reconstruction promotes a potentially irresponsible culture of quickly reconstructing destroyed heritage without respect for the context or current needs of the respective people. Through delving into Pandora's Box, this article aims to highlight ethical issues specific to digital reconstructions of heritage that need to be addressed in formal codes of ethics concerning the preservation of heritage represented by historical objects and sites.

Key words:

Digital Reconstruction, Photogrammetry, 3D Printing, Palmyra.

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1. INTRODUCTION

After the Islamic State of Iraq and Syria (ISIS) seized control of Palmyra in 2015, the terrorist group destroyed the Roman-era ruins of the ancient Syrian city. Amongst the casualties was the Arch of Triumph, which was built during the third century to commemorate the victory of the Roman Empire over the Parthians. In response to the destruction and loss of Palmyra's historic ruins, the Institute of Digital Archaeology (IDA) used 3D printing technology to create a physical reconstruction of the arch. Roger Michel, the Executive Director of the IDA, stated that "[t]he IDA is undertaking reconstructions of the lost monuments of the Middle East out of respect for the history and heritage

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these objects represent" [The Institute for Digital Archaeology 2016]. Original artifacts in museums and heritage sites are similarly preserved for, and presented to, the public because of the history and heritage that they represent. Accordingly, the reconstructed arch created using 3D printing technology should obey the basic ethical principles applied to preservation and presentation of original artifacts and heritage sites. These ethical principles include honest accounts of the history, ownership(s) and rights to heritage; ensuring an authentic presentation and experience of the heritage; and guaranteeing that the public has accessibility to the heritage as well as maintaining the ethical standards within the heritage sector.

Despite the rapid development and use of digital technology in the heritage sector, heritage organizations such as UNESCO and ICOMOS have not drafted formal codes of ethics relating to digitally generated reconstructions of historical objects and sites. Consequently, the staff of the IDA was neither advised nor obliged to comply with basic ethical responsibilities when they reconstructed Palmyra's Arch of Triumph. Nevertheless, the IDA provoked controversy for failing to address these ethical issues in their reconstruction of the arch. The Arch of Triumph was the first large-scale monument recreated using 3D printing technology, and it is therefore illustrative of a need to set ethical standards for future 3D reconstructions of heritage. Through exploring the ethical controversies provoked by the IDA's reconstruction of the Arch of Triumph, this essay aims to illustrate why the basic ethical standards applied to the display of original objects and sites should also apply to digitally generated reconstructions of heritage.

2. ETHICAL RESPONSIBILITIES FOR ORGANIZATIONS

During their ten-month occupation of Palmyra, ISIS simultaneously attacked the heritage and people of the city. Over 400 citizens were beheaded by ISIS, including Khaled al-Asaad, the archaeologist charged with the care of ancient heritage in Palmyra [Agencies in Beirut, 2015]. After al-Asaad refused to reveal the locations of Palmyra's most value artifacts under torture, ISIS executed him and hung his mutilated corpse on a remaining Roman column amongst the debris of the arch. In addition to prompting worldwide outrage and concern for the heritage and people of Syria, photographs of al-Asaad's headless body strapped to the ruins also firmly associated the loss of heritage with the loss of lives. Nevertheless, the IDA abstained from using their reconstruction of the arch to highlight the devastating human loss that accompanied the destruction of heritage in Palmyra. The IDA's failure to recognize the human loss that occurred in Palmyra contravenes the UNESCO Declaration concerning the Intentional Destruction of Cultural Heritage drafted in 2003. The declaration stipulates that "[s]tates [must] recognize the need to respect international rules related to the criminalization of gross violations of human rights... in particular, when intentional destruction of cultural heritage is linked to those violations" [UNESCO, 2003].

While publicizing and unveiling the reconstructed arches in London, New York and Dubai, both the IDA and representatives of these nations refrained from explicitly referring to the devastating human plight in Syria. Roger Michel, the executive director of the IDA, stated that by reconstructing the arch "we [the IDA] are restoring dignity to people" [Gayle 2015]. Boris Johnson, the Mayor of London, proclaimed that the arch was reconstructed "in solidarity with the people of Syria...in defiance of the barbarians who destroyed the original" [Brown 2016]. Alicia Glen, the deputy mayor of New York,

echoed Johnson's speech when stating that the exhibition of the arch in City Hall Park was "first and foremost, an act of solidarity with the people of Syria" [Voon 2016]. The executive director of the IDA, as well as the Mayors of London and New York, presented the reconstructed arch as a response to the suffering in Syria, which detracts from the fact that none of them actually pledged to actively improve the lives of the people in conflict. The three countries in which arches were reconstructed were countries that accepted a minimal number of refugees. These countries presented reconstructed arches as a token response to the Palmyra Offensive, which in turn prevented an escalation of public pressure to increase refugee intake.

The human loss that was incurred in the invasion of Palmyra was further downplayed by the celebration of the technological advances and creative talents that enabled the IDA to reconstruct the arch. During the unveiling of the arch in London, Johnson stated that the reconstruction represented "technology and determination." Similarly, the Deputy Mayor of New York said "[w]e're here today to celebrate hope, to celebrate how technology gives us hope for the future" [Voon 2016]. Michel said that the exhibition of the reconstructed arch was "proof of our competency to do these things" [Richardson 2016]. The celebration of technology was also at the heart of the exhibition of the arch in New York. Claire Voon, a journalist in New York, remarked that "[w]hat the park display did make clear was that the occasion presents an opportunity to show off technology. The only on-site supplement to the arch was [a] mobile, augmented reality experience" [Voon 2016]. When Voon enquired if the app included information about the arch, the developer said "no – people could just easily Google Palmyra's history or read about it on its Wikipedia page" [Voon 2016]. Although technology can provide an engaging means of communicating the Syrian crisis, the technology presented during the exhibition was more of a display of the accomplishments and talents of British and American organizations than a real effort to aid Syrians.

Furthermore, the IDA received criticism for not confronting or acknowledging the actions of the Assad regime that also inflicted harm on people and heritage of Palmyra. Under the control of Assad's forces, Palmyra was the home of the one of the regime's most brutal prisons for political dissenters [Taylor 2016]. Assad also ordered several strikes with Russian assistance over Palmyra during ISIS's occupation, which inflicted damage on the ancient ruins in the city [Taylor 2016]. The IDA framed ISIS as the sole threat to Syrian people and heritage, and in doing so they neglected the brutality of the Assad regime, which one resident of Palmyra described as "no better than Isis" [Alkhateb and Broomfield 2016]. In this way, the IDA has stood accused of condoning and even supporting the action of the Assad regime. The head of the Council for Arab-British Understanding stated that "Assad did not need a PR company as the Arch was unveiled, because it appeared to many to be another example of the refashioning of the "not so bad" and "not as evil as ISIS' Syrian regime" [Willits 2017]. A month before the reconstructed arch was unveiled in London, the Assad regime had recaptured Palmyra from ISIS. The reconstruction of the arch creates a censored narrative of recent history, in which ISIS is the sole culprit in the destruction of Palmyra's heritage. This censored narrative is not only unethical for not honestly condemning all groups involved in the destruction of Palmyra's heritage, but also enables the Assad regime to reinforce their oppressive regime in Palmyra without international intervention.

Many articles criticizing the IDA's reconstructed arch have argued that the Syrian people themselves should have made the decision of when and how to reconstruct the arch. Karima Bennouna, the UN

special rapporteur on cultural rights, presented a report to the UN General Assembly stating that organizations should be “consulting the people who have particular connections with heritage when seeking to determine whether they wish to rebuild or reconstruct such heritage, and if so, how and when” [Bevan 2017]. Journalist Robert Bevan summarized the conflict between the local and the international stakeholders for the ancient heritage when he stated that “while Palmyra may hold great significance to the world, the final decision should belong to those who have lived alongside it... the Syrian people” [Bevan 2016]. Reports of the reconstruction of the arch feature the support from Maamoun Abdulkarim, the director general of antiquities and museums in Syria, who is quoted as calling ISIS “barbarians” [Black 2015]. The articles featuring Abdulkarim’s support for the arch portray him as a spokesperson for the Syrian people, despite his position as an employee of the Assad government. Without reflecting on the barbarity of the regime that he serves, Abdulkarim demonizes ISIS as the sole destroyer of Palmyra. Abdulkarim’s employment compromises his capacity to serve or represent the interests of the Syrian people; therefore, the IDA appears not to have sufficiently consulted the Syrian people before reconstructing their heritage.

3. AUTHENTICITY

Nicholas Stanley-Price, the Director-General of the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), identified a list of arguments against reconstruction [Stanley-Price 2009, p. 37]. One of the most prominent arguments was “[t]he ethical issue of conveying erroneous information. Inaccurate reconstructions can mislead the professional and lay public unless identified as such” [Stanley-Price 2009, p. 39]. The IDA used photographs taken by tourists before the start of the Syrian war to reconstruct the arch. Unfortunately, archaeologist Kay Kohlmeyer explains that “[f]or anyone who is familiar with the Palmyra arch, this so-called replica has nothing to do with the original...in photogrammetry there is much room for error” [Garaev 2016]. The Factum Foundation, an organization that uses 3D scanning technology to create replicas of historical objects and art, posted an entry on their website to illustrate the inaccuracies produced through the use of photogrammetry [Factum Foundation 2016]. This organization used photographic comparisons of the original and the reconstructed arch to illustrate that the use of low-resolution photogrammetry to create the reconstructed arch meant that “[t]he stonework ha[d] been simplified [and] the capitals have entirely lost their sense and meaning” (Figg. 1 and 2), [Factum Foundation 2016]. With this photographic evidence, the Factum Foundation refuted Michel’s claim that the reconstructed arch was “completely indistinguishable from the original” as “misleading and irresponsible” [Factum Foundation 2016]. Through refuting Michel’s claim of the authentic likeness of the reconstructed arch, the Factum Foundation demonstrates an awareness and commitment to maintaining the ethical ideal of authenticity within the heritage sector.

The ethical commitment statement for ICOMOS members emphasizes authenticity as an integral principle in the conversation about and presentation of monuments and sites. This statement stipulated that “[t]he fundamental obligation of an ICOMOS member is to advocate the conservation of monuments, sites and places so that their cultural significance is retained as reliable evidence of the past.... This requires a comprehensive, holistic, dynamic and often multidisciplinary approach to guarantee authenticity and integrity.”



Figure 1: The top of the replica of the Arch of Triumph, London (photograph from the official website of the Factum Foundation, 2015) <<http://www.factumfoundation.org/pag/236/>> [Accessed 20 April 2017].

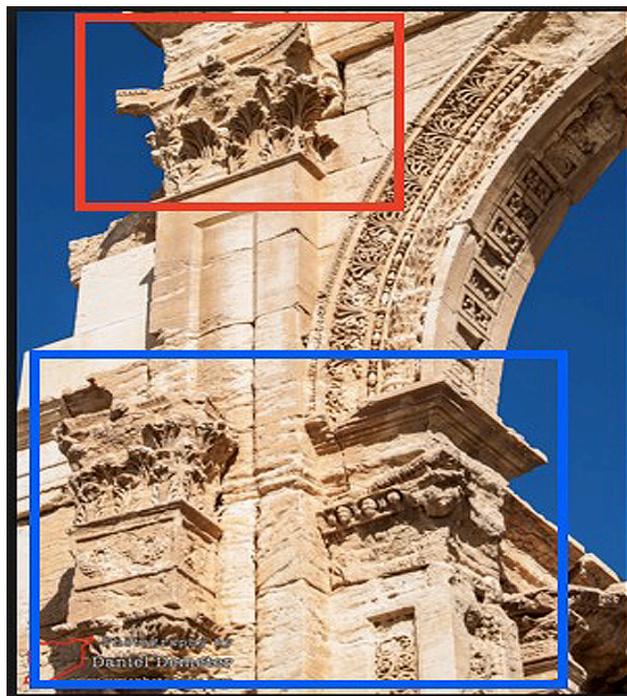


Figure 2: Image of a section of the original Arch of Triumph, Palmyra (photograph by Daniel Demeter for Syriaphotoguide.com and taken from the official website of the Factum Foundation, 2015) <<http://www.factumfoundation.org/pag/236/>> [Accessed 20 April 2017].

The first statement is that “authenticity judgements may be linked to the worth of a great variety of sources of information...[that] may include form and design, materials and substance, use and function, traditions and techniques.” Nevertheless, the choice of stone contributes to the inauthenticity of the entire reconstruction. The IDA used marble quarried in Italy, which was criticized by archaeologist Michal Gawlikowski, who stated that “historic accuracy demands only original stones are used to salvage a monument” [Bacchi 2016]. The yellow color of the marble visually distinguishes the reconstructed arch from the original. Journalist Sam Kriss, who visited the reconstructed arch in London, wrote that “the marble is smooth, bright and plasticky; it looks as much like a Roman ruin as the Disneyland castle looks like an actual medieval fortress” [Kriss 2016]. If the cultural significance of the original arch is to be maintained and conserved in the reconstructed arch, the IDA should have aimed to recreate the authenticity and integrity of the original arch in their reconstruction.

In addition to the color of the arch, the small scale of the reconstruction also contributed to the “Disneyfication” of Syrian heritage that Kriss insinuated in his description of the arch. The term “Disneyfication” refers in this case to heritage being presented as a theme park attraction. Cunliffe explains that “3D printing fails to capture the authenticity of the original structures, amounting to little more than the Disneyfication of heritage” [Cunliffe 2016]. The reconstructed arch is two-thirds the size of the original arch, which contributed to many historical inaccuracies in the reconstruction. The size and color fail to provide the public with the authentic experience of the monumentality and unique appearance that led the original Arch of Triumph to be given the status as a world heritage site by UNESCO. Through failing to provide onlookers with an authentic experience of the culturally significant architecture, the reconstruction is less likely to provoke a serious mediation of the loss of Syrian heritage.

Another important dimension for ensuring the authenticity of digital heritage is context. The exhibition of the reconstructed arch is decontextualized by the absence of written explanations accompanying the display. Without written notices to communicate the significance of the reconstructed arch as an “act of solidarity” and “defiance”, some of the public have misappropriated the reconstruction as a novelty attraction. Voon remarks that during the exhibition of the arch in New York “[s]elfies were quick to occur, but many people remained baffled about why exactly a copy of an 1,800-year-old arch from Western Asia was standing in downtown Manhattan” [Voon 2016]. The arch was also used as a background for a beauty pageant, which prompted one Iraqi twitter-user to write: “[a]ngered to see ‘Miss America’ model under replica of Arch of Palmyra... reduces significance of loss in Syria” [Al-Oraibi 2016]. The decontextualization of the arch thus reduces the impression of the arch being an authentic symbol of solidarity or defiance, which renders the reconstruction to be less effective as a means of raising awareness of the loss of Syrian heritage.

4. ACCESSIBILITY

Neumüller et al. [2014, p. 119] argued that 3D printing provided “multi-sensorial forms of experiencing culture [that] have a great benefit for the accessibility of cultural heritage, especially for persons with learning difficulties, for children, the elderly, for blind or visually impaired visitors.” However, the exhibition did not allow the public to walk between, touch, or engage with the arch in a “multi-

sensorial experience." Social anthropologist Michal Murawski described the arch as "flanked by burly, square-jawed security men with earpieces" in London, and the monument was no more accessible in New York [Murawski 2016]. Voon observed in New York "an invited group of two dozen guests in suits who watched from their reserved seating [and] received a better view of the arch than any members of the general public" [Voon 2016]. Consequently, the reconstructed arch defied the ethical responsibility to provide a widely accessible experience of heritage for the public.

While the reconstructed arch was not accessible for most Syrian people because of the locations where it was exhibited, the language used to describe the arch further distanced Syrian claims to their own heritage. When asked why the reconstructed arch would be displayed in London, Michel replied "our past is their past" [Richardson 2016]. The deputy mayor of New York described the reconstructed arch as "an expression of our shared history"

[Bond 2016]. Likewise, the Minister of Cabinet Affairs of the UAE stated that the arch presents a way in which "aspects of shared human history" can be preserved [Al Gergawi 2017]. Despite these statements declaring common humanity uniting these countries to Syria, these statements appear tokenistic because of the reluctance to share their countries with Syrian refugees. The UAE had over 250,000 Syrians living in the country in 2016; however, most of these people were educated professionals who had to obtain work visas because the UAE did not accept people with refugee status [McFarlane 2016]. International and public pressure compelled the UK government to house 20,000 Syrian refugees by 2020 [Lyons 2016]. Unfortunately, a report by the Local Government Association has found that the UK will not achieve this target, because a third of local councils have refused to accept Syrian refugees [Lyons 2016]. The USA aimed to take in 10,000 refugees, a small number considering its size and wealth [The Washington Post Editorial Board 2016]. Consequently, the claims of shared humanity and history suggest that these nations appropriate Syrian culture rather than genuinely empathizing with the Syrian people.

Digital heritage also has an ethical responsibility to increase its accessibility by being available online. Bond explains that "[i]f these artifacts truly belong to the public, all 3D models and images should be openly accessible and downloadable for replication" [Bond 2016]. Through not making their arch data available online, the IDA had been accused of "digital colonialism," whereby an organization had seized a patent of a historical object or site [Bond 2016]. By withholding the patent of the reconstructed arch, the IDA's act of "digital colonialism" does not allow Syrian people access to their own heritage. In 2011, Farida Shaheed, a special reporter on cultural rights for the Office of the United Nations High Commission for Human Rights, argued that access to cultural heritage was a fundamental human right [Office of the United Nations High Commissioner for Human Rights 2011]. Accordingly, restricting online availability of digital heritage is unethical because it denies people access to cultural heritage.

5. THE ETHICAL IMPLICATIONS OF PHYSICAL 3D RECONSTRUCTIONS

The reconstruction of heritage that was targeted by terrorist organizations creates ethical issues concerning human safety. For example, it was feared that the exhibition of the reconstructed arch might provoke an act of terror. Journalist Damien Gayle reported that Alexy Karenowska, the IDA's director of technology, 'downplayed' the security risks and stated "[a] building like the National

Gallery or Trafalgar Square, these are major targets by virtue of what they are." The IDA has a similarly blasé attitude to the safety of people participating in their Million Image Database project, which provides volunteers with 3D cameras to capture photographs of endangered heritage in order to create more physical reconstructions [The Institute for Digital Archaeology 2017]. Kohlmeyer stated that "[w]e also need to think about the fact that we are sending these people into a dangerous situation. Imagine there's a monument in IS territory and somebody comes with a camera – certainly he will be killed" [Garaev 2016]. While stressing the need to protect heritage, the acts of the IDA could potentially endanger lives.

The reconstruction of the arch has prompted an ethos for quickly reconstructing destroyed heritage, which creates ethical issues concerning political agendas. Michel reportedly offered "the Syrians two printers, that he claims can operate at a speed that "should enable us to rebuild what has been destroyed inside six months" [Jenkins 2016]. UNESCO had initiated plans to reconstruct the ruins of Palmyra with Russian financial support; however, these plans were abandoned due to pressure from a petition by the Avaaz organization against the hasty reconstruction. The online petition protested against "the protection and future of Syrian heritage [being] discussed with and decided by Russian President Vladimir Putin, an active player in this gruesome conflict and a perpetrator of human and cultural rights violations" [Avaaz 2017]. Although the IDA's involvement with the reconstruction of Palmyra would not involve the Russian government, the IDA did not acknowledge Russia's contribution to the destruction of Palmyra. Consequently, a quick reconstruction of the ruins of Palmyra may cover up the atrocities committed by the Russian government.

Some critics of the arch argued that it should have shown the damage inflicted on the ruins at the hands of ISIS, which would highlight the destruction of Palmyra to the international community. Dr. Emma Cunliffe, from the Blue Shield, a charity working to protect archaeological sites from conflict and natural disaster, stated that "[i]f we do rebuild something, we can also incorporate what has happened to that site, and how it has affected people" [Clammer 2016]. Cunliffe's statement also implies the wider intrinsic ethical issue with reconstructions: whether reconstructions of heritage erase the trauma of loss and the suffering of the source community. Debate concerning this issue halted any efforts to reconstruct the Buddhas of Bamiyan in Afghanistan, which were destroyed by the Taliban in 2001. The enclaves where the Buddhas once stood remain empty; however, a Chinese couple did use 3D laser light projection technology to temporarily project a holographic image of the Buddhas into the enclaves in 2015 [Russon 2015]. The semi-transparent projections effectively communicated the loss of the monuments. In this way, the IDA should have considered in what ways the memory of destruction could be communicated through the reconstruction of the arch.

Furthermore, the reconstruction of heritage using 3D printing also contravenes guidelines issued by UNESCO to ensure that the reconstructions remain authentic. The Charter of Venice advises that "[a]ll reconstruction work should be ruled out a priori. Only anastylosis, that is to say, the reassembling of existing but dismembered parts can be permitted" [ICOMOS 1964, p. 4]. As previously mentioned, the 3D printing technology used by the IDA did not produce a reconstruction that closely resembled the original. Consequently, this technology would produce a reconstruction in which the 3D printed components used to reassemble the arch are clearly distinguishable. The new additions to the reconstruction may cause the structure to lose the significance it once held for the people of Palmyra. Philippe de Montebello, the former Director of the Metropolitan Museum of Art, referred to

the potential reconstruction of the Bamiyan Buddhas as “an egregious betrayal of authenticity [that]... will have betrayed public trust.” An inauthentic reconstruction of the Arch of Triumph will not only betray the Syrian people but also the international stakeholders in the ancient heritage that the arch presented. Within the heritage sector, there is consensus that heritage organizations have an ethical responsibility to serve the interests of and be a benefit to the public [Silberman and Bauer 2012, p. 493]. Inaccurate reconstructions of heritage that fail to meet public expectation would ultimately defeat this key ethical responsibility.

6. CONCLUSION

3D printing technology essentially reproduces historical objects and sites, which has challenged the conventional application of ethics to heritage. As previously discussed, established ethical principles and responsibilities concerning heritage typically refer to the perseveration and presentation of original objects and sites. The absence of explicit references to digital heritage creates a loophole for organizations producing this type of heritage, whereby they are able to disregard basic ethical considerations in their recreation of historical objects and sites. The fundamental issue with exploiting this loophole was demonstrated in the controversy surrounding the reconstructed Arch of Triumph.

The controversy surrounding the reconstructed arch was largely centered on four key ethical issues. First, the IDA failed to explicitly address the devastating human loss in Palmyra and the Assad regime’s contribution to the destruction of Syrian heritage. Second, the reconstructed arch appears inauthentic due to the material and methods used to recreate the structure. Third, the three cities chose to display the reconstructed arch in a way that limits public accessibility to the reconstruction. Finally, the reconstruction of the arch also encourages an ethos of quickly reconstructing destroyed heritage regardless of the current situation and needs within the concerned country. These four issues concern the value of honesty, authenticity, accessibility and long-term consideration for the heritage sector respectively, which are all values that are emphasized in existing guidance and advice regarding the ethical preservation and presentation of heritage.

Ultimately, the controversy surrounding the reconstruction of the Arch of Triumph resulted from a perceived disregard for basic ethical principles customarily applied to heritage. Despite the fact that 3D printing technology produces replicas of historical objects and sites, criticism of the reconstructed Arch of Triumph indicates an expectation that reconstructions should abide by the same ethical principles as the original object or site. In addition, digital reconstructions also aim to preserve and present the heritage in the same manner as the original objects or sites they are based on. Consequently, current ethical guidelines for heritage should be amended to include ethical standards for digital reconstructions of heritage.

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