Protecting the bytes of the past: Information security and digital-born cultural heritage

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Today, cultural heritage increasingly goes digital. The growing number of museums, libraries and archives provide online access to their material collections by digitizing them and sharing through web portals. Simultaneously, new collections of digital-born objects which never existed in the analogue form are established. These digital objects, as UNESCO Charter on Digital Heritage (2003) notes, are more ephemeral than artifacts from the pre-digital time, and thus require "purposeful production, maintenance and management to be retained".

The preservation and management of digital-born cultural objects is a challenging task for multiple reasons, varying from the obsolescence of software and hardware to the lack of legislative support for these objects' maintenance. In our paper, however, we focus on one specific challenge which so far received limited recognition in the academic scholarship – i.e. the particular susceptibility of digital-born heritage to adversarial attacks. While a number of studies (Stone (2009); Brosché et al. (2016); Dougherty, 2019) discuss attacks against cultural heritage, in particular at the time of armed conflicts, their primary focus is on material cultural objects. Yet, as the digital spaces are increasingly weaponized, digital collections also come under fire.

Unlike material collections, whose digital copies can be restored in the case of their deliberate destruction online, digital-born objects are more susceptible for permanent erasure as part of adversarial campaign against opponents' symbols of identity and collective memory. Additionally, digital-born cultural objects can be manipulated, leading to the loss of authenticity and facilitating their instrumental use by adversarial actors. Such instrumental uses are increasingly common part of today's political ecosystems, where both conventional and non-conventional actors weaponize cultural heritage to mobilize supporters and stigmatize opponents (see, for instance, de Saint-Laurent et al., 2017; Benazzo, 2017; Makhortykh, 2018).

In our paper, we approach the challenges related to the preservation of the digital-born heritage from the information security point of view. For this purpose, we critically review existing literature on the information security in the domain of digital heritage and couple it with the discussion of known instances of adversarial attacks against online museums and archives. Using the CIA model (i.e. confidentiality, integrity and availability), we classify most common types of attacks against digital-born heritage collections and discuss the possible short- and long-term implications of these attacks. We conclude by proposing several strategies for countering adversarial attacks and safeguarding digital heritage which take into account different technical and political contexts in which the attacks take place.