The challenges of preservation: digitizing graffiti in the urban landscape

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ABSTRACT

Graffiti have always been a contested form of human expression. Although they have increasingly been accepted as museum objects or study topics, in many cases they are neglected or even actively rejected as human expressions worth documenting and (digitally) preserving. However, some scholarly initiatives have tried to overcome this lack of coverage of the graffiti scene. INGRID, for example, collects images from Germany over a span of forty years, while SprayCity archives photos of graffiti from all over Austria and beyond. The limitations with pre-existing solutions, however, is that they do not have standardized criteria to create and process the digital surrogates of graffiti, especially because they derive the photos from different sources.

Project INDIGO aims to overcome these difficulties by offering a systematic, standardized and extensive coverage of a specific area of the city of Vienna, the Danube Canal, which has been a hotspot for graffiti production since the 1980s. For this purpose, INDIGO has developed a highly reliable and reproducible workflow that ensures color accuracy and automated orthorectification of the pictures, and has combined it with a curated digital preservation strategy that involves different services, such as the digital repository ARCHE and the spatial database application OpenAtlas.

While drawing on the specific experience and knowledge acquired in the course of project INDIGO, this paper aims to offer an overview of the challenges that must be faced when digitizing, documenting and preserving contemporary graffiti. It will focus on three key aspects: (1) heritagization, i.e. the process by which an object made by humans such as a graffito becomes a valuable sample of cultural heritage; (2) FAIRness, the compliance with the so-called FAIR principles (findability, accessibility, interoperability, reusability) in the development of a digital preservation strategy for graffiti; (3) sustainability, i.e. how we can ensure that the data and services provided can integrate into the existing research environment, in order to safeguard the continuous relevance of the products of the research project.

While graffiti are an edge case in the field of current studies, this paper aims to show that discussing the challenges linked to the digital preservation of graffiti can also help us think more carefully about possible improvements in digital preservation strategies for other, more traditionally accepted, kinds of cultural heritage assets.

KEYWORDS

Graffiti; Cultural heritage; Digital preservation; FAIR principles; Linked Open Data; Sustainability

1. INTRODUCTION

Graffiti are ubiquitous, disputable, multifaceted. They often transcend the boundaries between art and vandalism, graphic and textual, criticism and entertainment. Graffiti are becoming an increasingly relevant subject in both academic research and public discourse [13], as they raise pressing questions about intellectual property, the applicability of stylistic and generic categories, and the commercial exploitation of visual works. Accordingly, some efforts have been made to digitize and document them in a more comprehensive way, in order to allow easy retrieval and critical analysis of these materials. For example, INGRID (*Informationssystem Graffiti in Deutschland*; English: information system for graffiti in Germany) [12] digitally archives photos of graffiti in Germany from collections spanning a period of forty years (from 1983 to the present) and allows users to easily annotate and search these digital records. SprayCity [23] documents graffiti in many different cities, with a special focus on Vienna, by including photos taken by the curators, the graffitists themselvesand the general public.

However, since these archives are based on material from very different sources, they lack strict guidelines and standardization criteria, especially with regard to the photographic material collected, and offer a necessarily unsystematic (though broad) coverage of their reference areas.

The ongoing project INDIGO (*IN-ventory and DI-sseminate G-raffiti along the d-O-naukanal*; running from September 2021 to August 2023) [19] takes a different approach, focusing on a more restricted but very active production context, the Danube Canal in the city of Vienna, and aims to digitize and document the graffiti present on almost 13km of surface in a more standardized, accurate, and comprehensive way. INDIGO is the result of a collaboration between several (mostly Austrian) institutions and is funded by the Heritage Science Austria program of the Austrian Academy of Sciences (ÖAW). The Danube Canal has been the hotspot of graffiti production in Vienna since the 1980s and has since attracted a wealth of Austrian and international graffitists over the years. More recently, it has also been the site of numerous graffiti-related initiatives, such as tours and workshops;in addition, the growing fascination with its graffitied walls has prompted the opening of several new venues that target an affluent audience, reflecting the ongoing interaction between graffiti and the interests and priorities of different players in the scene.

The aim of this paper is to illustrate some of the challenges faced in the process of digitally documenting and preserving graffiti, as well as the multiple possibilities offered by the use of digital methods in graffiti research. However, while this paper is mainly based on the experience and *interim* results of the INDIGO project, it also aims to offer a broader methodological reflection, applicable not only to graffiti research, but also to other fields and cultural objects.

2. HERITAGIZATION

Traditionally, the idea of cultural heritage has been limited to physical objects received from the past, whose artistic merit was already sanctioned by some higher authority and whose preservation was restricted to institutions such as museums and archives. The expansion of scholarly interests as well as technological developments, especially in the last two decades, have led to increased consideration of other forms of human expression, which include more volatile or intangible elements such as oral traditions, music, and films [17, 18].

Graffiti occupy a special place in the realm of cultural heritage [10]. While graffiti are being increasingly recognized as a form of cultural heritage worthy of the same consideration as other objects, they are often not only neglected, but even actively rejected as human expressions worthy of documentation and preservation. For example, searching for 'graffiti' and 'cultural heritage' in databases of scholarly publications such as Google Scholar (as of 2023-05-05) yields several articles (e.g., [8])that highlight, more than the closeness between graffiti and cultural heritage, the *damage* made by graffiti to what is usually considered cultural heritage. The very category of street art [3] seems to have caught on precisely to avoid this conundrum: how to give value to something that is contested, often unauthorized, and unconventional by its very nature? How to make a distinction between 'good' and 'bad' graffiti?

We could use different criteria to determine whether a graffito is worth preserving. For example, we could decide that only graffiti with some artistic value should be selected. However, defining what constitutes art is probably even more subjective and complicated than the definition of cultural heritage itself. Or we could select graffiti that have historical or political relevance. But this is a limitation that does not really apply to cultural heritage, which – on the contrary – is a category that aims to encompass as many cultural aspects of a civilizationas possible.

It is difficult – and perhaps impossible – to establish criteria that are clearly defined and unconditionally valid in every situation. The discussion may have to be left open – and may never be solved. Nevertheless, we could still draw three important lessons from the discussion of whether contemporary graffiti should be considered cultural heritage.

First, what determines whether a graffito is preserved is usually a combination of factors and historically contingent phenomena. We may need to look at the overall context in which some graffiti are placed to really understand their cultural significance. While a single graffito on any wall in Vienna might appear to be the irrelevant result of an extemporaneous act of vandalism, the interplay of several thousand graffiti on the entire Danube Canal, the key role that this part of the city has been playing in more recent social developments, the central position that it has acquired in the representation of Vienna itself (for example in advertising, as seen in [5]), all contribute to the Danube Canal's cultural importance.

Second, time plays an important role. This may seem like an obvious observation. However, time often has a significance that we are not fully aware of when we determine the objects of our academic fields. For example, we may include something in archaeology because we consider it old enough to be an object of some value and worthy of study. However, the boundaries of what we consider 'archaeological' are constantly shifting. What in the 1920s was considered to be secondary material that could be discarded is now considered to be a precious testimony to an age long since lost [6]. But time can only play its game if a process of preservation takes place, either intentionally (as in libraries or archives) or accidentally (as in the case of Pompeii).

This leads to a third observation. Preservation is often a major factor in *creating*cultural heritage, or in the words of Laurajane Smith: "heritage is heritage *because* it is subjected to the management and preservation/conservation process, not because it simply '*is*'" [15, p. 3]. The act of preservation itself has an effect, either directly or indirectly, on the material

being preserved. Preservation is a process that, given the assumptions that shape the scholarly community and the society at large, not only aims to maintain the materials in the state in which we received them, but also legitimizes those materials and gives them an institutional/communal framework in which to be represented. We should think of digital preservation – and any form of preservation, for that matter – as more active (and sometimes even more invasive) than we usually do.

3. FAIRNESS

Digitizing graffiti can be a daunting task. In some cases, graffiti may be placed in difficult locations, such that it is only possible to take photos from angles that give a partial view of the artifact. In addition, since they are in most cases located in open air, one must always consider the influence of external light and possible shadows on the color rendition of the photo. Project INDIGO has developed a workflow that enables accurate color rendition [11] and automatic production of orthophotos [21] at predefined spatial resolutions [19]. The standards held by project INDIGO in the digitization process allow direct comparison between the digital representations of different artifacts and enhance the reusability of these resources, as recommended by the FAIR principles [22]. In fact, standardization operates at different stages of the workflow, both in the digitization phase, where specific conditions must be met to allow for comparable results, and in the post-processing and curation phase, where the acquired data must be brought into compliance with explicitly stated criteria and guidelines.

Especially in the case of graffiti – but also for any other kind of material – the process of standardization should begin long before the final curation of data for preservation purposes. While the outcome of many research projects is a valuable effort and a trove of further possibilities, it is often the workflow itself that can ensure that such data are reusable and valuable to other scholars. Moreover, strict guidelines and good documentation are essential because the digital surrogate is often all we have of a graffito. A digitized graffito is not only a backup of the physical object or a more comfortable, alternative way of analyzing the object. In many cases, it is the only way to study the object. To perform automated and reliable analyses, it is necessary that all images are acquired and pre-processed according to stable and explicitly documented criteria. When created and annotated according to clear guidelines, a graffiti dataset opens up a world of possibilities, like training a machine learning model.

Findability and accessibility also play a key role in graffiti research. Since graffiti are ephemeral and often on the fringe of academic studies, very few catalogs or other forms of collections are available. Therefore, it is important that graffiti can be identified and retrieved quickly and reliably. And actually, one of the advantages that make graffiti particularly suitable to modern semantic technologies is that they are, by their very nature, 'linked'.

Graffiti are contextual and interconnected at several levels. For example, there is a strong connection between a graffito and its physical location: pre-existing elements of the urban setting can be integrated into the graffito itself, or specific locations can provide value or an additional meaning to a graffito. Graffiti can also interconnect according to a sequential arrangement, because a graffito might refer (in a more or less explicit way) to a previous one; might supplement or complete another creation; or might even overlap with another graffito or completely cover it, sometimes as an expression of rivalry between two graffitists (a phenomenon known as 'crossing'). In this sense, the graffiti landscape creates a sort of contemporary stratigraphy typical of the Anthropocene. Furthermore, graffiti can create links between different parts of a city, different cities or different countries, when creators leave their mark in several places.

All these peculiarities require that the relationships between graffiti, as well as those between graffiti and other kinds of objects or entities, are described in the most detailed and meaningful way. Linked Open Data thus establishes itself as the best conceptual framework to represent this information and link it with other sources. In the context of project INDIGO, technical, administrative and descriptive metadata are stored both in the image files themselves (as embedded Exif or IPTC) as well as in XMP carrier files [1], where they are modeled according to an RDF-based ontology. Information regarding the authorship, physical aspects, and themes of the graffiti is recorded according to the CIDOC CRM ontology [4] for cultural heritage. Concepts and categories like style elements are referred to by newly minted URIs, for example in a SKOS-based thesaurus stored on a stable server [14]; where possible, a match is established with existing concepts, for example from the Getty Art & Architecture Thesaurus [7]. Other types of entities, like artists, are referred to by means of existing Wikidata identifiers, or new Wikidata identifiers are contributed if not already present. The ubiquity of RDF-based standards on the whole scale of the digitization and annotation process thus facilitates data exploration and querying and contributes to the FAIRness of the resulting dataset.

4. SUSTAINABILITY

With graffiti, exhaustiveness is almost impossible. At any moment of the day, a new graffito may be created; graffiti may be located in places that are difficult to access and survey; sometimes they may be removed by public authorities or private

initiatives. The end date of an academic project is only an arbitrary (though necessary) point in time, because the corpus of graffiti, even in a limited area, constantly acquires new items. From this point of view, we have to deal with a situation that is very different from that of more closed (or slower growing) corpora.

Even when we can treat a set of graffiti (chronologically and/or geographically determined) as a somewhat closed corpus, the diversity of approaches, interpretations, and even terminological uses present in the community demands that a workflow aimed at describing and preserving graffiti be as robust as it is flexible. It must be capable of giving space to alternative views on the same artifacts or concepts, and it must be able to accommodate updates and constant improvements without too many problems, as new elements come to the surface that may shed light on the existing material.

Therefore, when it comes to sustainability in relation to graffiti, the concept takes on additional connotations and is linked to a series of specific steps that need to be taken at each stage of an academic project. It is not only a matter of keeping a service running as efficiently and economically as possible, but also, for example, of providing a way to integrate it with other services and applications.This will help keepthe service (and the data it provides) relevant in the future.

In the case of project INDIGO, the digital repository ARCHE (*A Resource Centre for the HumanitiEs*) [2, 16] represents the backbone from which the other applications used or developed within the project can retrieve data and metadata. ARCHE offers an easy-to-use and thoroughly documented API [24] that enables access to data in several formats and through diverse dissemination services. One of them is based on the popular ExifTool [9] Perl library and command-line tool, and allows to extract metadata of different formats (Exif, IPTC, XMP) embedded in the images. Thanks to this dissemination service, applications like OpenAtlas [20] can retrieve the information needed with a simple API request and create a spatial database of the graffiti.

Since OpenAtlas can also serve as a tool by which curators can semantically annotate graffiti, the data flow does not only go in one direction. It is possible to re-ingest the image files (and their embedded metadata) into the ARCHE repository in a smooth way, and update the metadata used for internal organization of the repository. This way, digital archiving becomes not only a one-time process that occurs at the very end of a project, but a continuous operation that is integral (and beneficial) to the research workflow.

When considering sustainability, it is also important that a graffiti research project establishes a close connection with the community (academic and non-academic) of interest, because it is one of the tasks of such a project to give back to the community on which it primarily relied – for example, by creating interactive presentations of the collected material, by organizing exhibitions or workshops that can appeal to a broad audience, or by stressing the need to preserve graffiti. This is all the more important since the community will be able to keep the project alive if it is interested, either with additional funding, onboarding in other pre-existing initiatives, or more informal engagement.

Thus, a digital repository should not be seen only as a last resort for data, where the data must be archived in order to comply with regulations by funding bodies and be retrieved only in case of emergency. It can – and should – also serve as a starting point for further projects.

5. CONCLUSIONS

There are challenges to digitizing and preserving graffiti that go beyond the challenges we face with other cultural heritage assets. However, discussing and finding solutions to the challenges associated with graffiti can help us improve digital preservation strategies for other materials. For example, it may provide digitization standards that allow for more color-accurate acquisition of images of manuscripts (thus facilitating comprehensive analyses of the physical properties of such artifacts). Or it may provide the impetus for action on digital preservation of still undervalued materials.

6. ACKNOWLEDGEMENTS

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