Proceeding Paper

Open Cultural Data and MediaWiki Software for a Museum: The Use Case of Musée Saint-Raymond (Toulouse, France) †

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Abstract: Freely accessible online databases developed by cultural and artistic institutions (e.g., museums, libraries, universities, studios, etc.) enable the transnational dissemination of catalogues of cultural and creative works, exploiting the advantages of modern technologies. Intelligent tools, which use advanced algorithms to classify and contextualize data, can foster knowledge mainly in two ways: (1) providing a stable and accessible basis for large amounts of data; (2) promoting cultural heritage. A case of skillful use of such tools is the Saint-Raymond Museum, the archaeological museum of Toulouse. For several years it has been working on the open data front and on putting its catalogue online on Wikimedia platforms, in various forms.

Keywords: museum; open data; cultural impact; sharing knowledge

1. Introduction

The convergence of protection of cultural heritage and open tools adapted to cultural data has the potential of creating a vast self-sustained ecosystem. Accessible and free to use online catalogues both protect and bring out archaeological collections and artefacts, while attracting a wide audience of people interested and willing to participate in sharing. In the last few years, there is a clear trend toward opening the data, and providing free access to information. Some governments follow this trend, and, among them, in France the "Loi pour une République numérique" enacted in 2016 makes it mandatory to freely share public data. However, this is not an isolated case. Even if open data are not common practice yet, more and more cases are spreading in which institutions open their assets not only for the digital use of their collections, but for the reuse of the data associated with them. In Europe a clear example comes from the large Europeana portal and data aggregator, while several European nations are developing data repositories. An exhaustive, but not complete, list of open cultural projects can be found on the Data.europa.eu portal. A similar approach to open access for cultural heritage databases has been adopted in the US as well, where, at the government level, beginning in 2009, the Library of Congress converted its famous subject headings and authority names into Linked open data (LOD) through the Library of Congress Linked Open Data Service portal.

In this paper, we will see the case history of the musée Saint-Raymond, the archaeological museum of Toulouse, France. The musée Saint-Raymond utilizes Wikimedia platforms since 2016 to publish and share its collections that cover a vast period of time, from protohistory to middle age, with a rich series of Roman sculptures from the Villa of Chiragan. This asset represents both a treasure to preserve and a challenge in showcasing it. By making use of Wikimedia platforms, the museum uses free licenses to distribute data related to its collections, and, at the same time, to organize the curator's work using the WWW and

web-related tools. As open data represent both an opportunity and a government directive, this assignment is anchored for the museum in its fundamental educational missions, and the Wikimedia projects amplify its audience thanks to their hegemonic presence on the web and the activity of a large community. More than just publishing, sharing open data and open content over free licenses promotes the emergence of new uses and allows the collections to go outside their original disciplinary fields.

In the following section, we will see how this contribution from the Musée Saint Raymond has been made possible by French legislation, and by the European context where open data and open access are encouraged, besides some specific exceptions. We will also see how open data and open access are defined and how free licenses are an important aspect when sharing knowledge. Section 3 describes the different platforms that constitute the Wikimedia environment, and how they provide structured and dynamic platforms for open cultural data. In the same section we also describe the ways the Musée Saint Raymond uses open access to create a de facto open data collection of all the museum artworks using Mediawiki platforms. In Section 5 we discuss the perspective of open catalogues and we focus on the experience of sharing knowledge on online platforms in the peculiar COVID-19 years. We eventually conclude with some perspective on cultural data management.

2. Open Data and Open Access in the Cultural European Context

2.1. Open data and Open Access

Cultural and information institutions hold knowledge, structured and unstructured data, such as a catalogue of the collections, originally used for internal purposes. Yet their resources and services are crucial to the development of information literate, innovative and heritage aware societies. Since the end of the 20th century, cultural heritage institutions such as libraries, archives, and museums are searching for new ways to engage with their public. Opening their data is one of the main ways to use the Web technology to reach out to a novel public, and to engage patrons in using such data to eventually share the cultural heritage. "Technology drives change because it alters culture" [1] and riding this "technological horse" affects and modernizes both the image of cultural heritage, and the way it is shared. In the 21st century, technology is mature to make possible an unprecedented access to education worldwide, and to spread culture and knowledge freely [2] However, cultural and information institutions, as they are the gateways to knowledge and culture, should promote information access via suitable open policies. Open data are data that can be freely used, shared and built on by anyone, anywhere, for any purpose (*Open Definition* which the Open Knowledge Foundation created in 2005). This can be achieved in two ways, as stated by the Open Knowledge Foundation, namely:

- Legal openness: any work is protected by copyright. This means that, in order to legally use some data (photograph, database, text, etc.), they must be published under an appropriate (free) license.
- Technological openness: data can be released under a free license, but if they are not accessible, they cannot be considered as open. Technology must permit access to information, to process it and redistribute it easily. This means that data have to be machine readable and available in bulk, for instance.

Open access, which is the term generally employed for literature, means that "data are free available on the public Internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself" (*Budapest Open Access Initiative*, https://www.budapestopenaccessinitiative.org/, accessed on 12 August 2021). This concept is very close to open data, and has been shown to be economically beneficial, as it gives authors and their works an enlarged and measurable new visibility, readership, and impact [3] Both these concepts rely on free licenses. With these licenses, the authors or copyright owners irrevocably grant to all users,

for an unlimited period, the right to use, copy, modify, and distribute their work, generally under the condition that proper attribution is given, and the derivative work is republished under the same conditions. License GPL-3.0+, Creative Commons BY, and ODbL-1.0 are considered as free and open licenses. An early example of adopting open access to their collections is the Rijksmuseum in Amsterdam, the Netherlands. Their dataset, consisting of 112,039 photographic reproductions of the artworks exhibited in the Rijksmuseum, is freely available for any kind of reuse [4] The photographs of objects from the collections are shared by the museum together with descriptive object information (metadata) and bibliographic data via their data services, without restrictions on reuse. All this data about the Rijksmuseum collections is released under CC0 Public Domain Statement, which allows a very large and diverse audience to use the material in any way, sharing the knowledge about it. By providing technological openness, the Rijksmuseum encourages repeated visits from their users that scrutinize new digitization and new insights in the collections.

2.2. European, French and Italian Context

The Rijksmuseum is not an isolated case. In Europe, we see the National Library of Spain launching an open data portal and different projects based on the reuse of its data, such as BNEscolar; the Miguel de Cervantes Virtual Library Foundation, whose catalogue consists of more than 230,000 records open for reuse; the Norwegian platform DigitaltMuseum. The British Museum has also adopted an open approach (at least for individual use: the data release license is in fact CC-BY-NC-SA, which prevents use for commercial purposes): cultural open data are uploaded in the form of high-resolution images of artworks. The database of the British museum is one of the earliest and most extensive online museum search platforms in the world. There are currently 2,335,338 records available, which represent more than 4,000,000 objects. At least 1,018,471 records have one or more images. In the US, at the government level, beginning in 2009, the Library of Congress (LOC) converted its famous subject headings and authority names into linked open data through the Library of Congress Linked Open Data Service portal. In 2017, the New York Metropolitan Museum implemented a new open data policy: it creates, organizes and disseminates a wide range of images and digital data that document the history of the museum and its collection. With this policy, the images of selected works of art that are in the public domain—and, therefore, with lack of copyright—have been made available to users without restrictions or cost, in accordance with the Creative Commons Zero designation (CC0). In total there are 406,000 high resolution images, accompanied by basic information such as title, artist, date, medium and dimensions.

In France, the law *Loi pour une République numérique*, enacted in 2016, makes it mandatory to share public data freely. However, in fact, open data are not common practice yet. The major obstacle in cultural institutions, and more specifically in museums, is the copyright applied on photographs of cultural heritage. As an institution, you have to ensure that the photographer of an object has assigned his property rights in order to be able to disseminate them under a free license. Another major impediment is the photographic agencies that subcontract the management of the photographic collections of museums whose business model is undermined by the open data movement. That concerns mainly all the national museums in France that depend on the RMN photo agency. That is why the only initiatives come from territorial museums governed by politically autonomous local authorities such as the cities of Paris or Toulouse or the region Bretagne. The Open Knowledge Foundation annually updates the Global Open Data Index, an international ranking that examines 94 countries and 1410 datasets, establishing that only 11% of them can be considered technically and legally open (see also Open GLAM Survey by Douglas Mc Carthy and Andrea Wallace, https://pro.europeana.eu/post/exploring-the-global-picture-of-open-glam). Italy, which is a major actor of cultural heritage worldwide, ranks 32nd, with a serious gap in the geographic and geospatial information, which are essential for mapping the territory. This is the only existing study about the opening of data in the various sectors from which a non-linear and non-punctual process emerges. To remedy this aspect, the Agency for

Digital Italy (AgID) updated the National Guidelines for the Enhancement of Public Information Assets in 2017, so as to offer a reference for all public administrations that want to make their data available in an open format. From a survey of the datasets available at regional level, however, an extremely diversified situation emerges regarding the type, license and quality of data: some formats, according to the well-known classification for LOD by Tim Berners Lee (https://www.w3.org/DesignIssues/LinkedData.html), would barely reach the two stars. Here we briefly emphasize only the importance of updating the datasets, which in Lombardy takes place quarterly in some cases, while elsewhere it dates back to 2015, and of the maximum coverage of the information available—significant gaps are found in the mapping of the Lazio POIs, limited to the northern part of the region only.

Although formally Italy is among the European "trend setter" nations in terms of policy, impact, maturity of portals and quality, this disparity explains why the situation is not so good. Two contemporary research works conducted by the eGovernment Observatory of the School of Management of the Politecnico di Milano focused on local PA, by UnionCamere on businesses, show a different reality: only one municipality out of three public open data of public interest about public transport, tourism, culture, and does it more for regulatory obligation that for understanding of a real utility.

Worthy of merit is the operation of the Egyptian Museum "Turin Papyrus Online Platform (TPOP)" which, as the slogan of the site itself states, is "a step beyond closed archives towards open data": it is digitization and uploading online of one of the most significant collections of papyri in the world that is kept by the Egyptian Museum, with about 700 complete manuscripts (intact or reassembled) to which are added over 17 thousand fragments, freely accessible upon registration. However, this remains an isolated case in a country where the majority of cultural institutions still dream of gathering revenue from selling the rights to photograph Italian historical heritage, which ironically have been artworks in the public domain for centuries.

3. Freely Accessible Online Databases of Open Cultural Data and Wikimedia Platforms: The Use Case of Musée Saint-Raymond (Toulouse, France)

Freely accessible online databases developed by cultural and artistic institutions (e.g., museums, libraries, universities, studios, etc.) enable the transnational dissemination of catalogues of cultural and creative works, exploiting the advantages of modern technologies. Intelligent tools, which use advanced algorithms to classify and contextualize data, can foster knowledge mainly in two ways: (1) providing a stable and accessible basis for a large amount of data and (2) promoting cultural heritage. Moreover, the possibility to perform federated queries, i.e., to search and to relate information from linked datasets, allow us to integrate, connect and mix data from different sources, resulting in new and innovative applications. Linked data are a standard way to represent data on a wide range of topics [5]. By applying this standard to open data, any cultural heritage actor can combine its own data with other linked open datasets. Thus, any cultural institution can enrich their own collections through collaboration, or even promote the creation of new specific datasets tailored to their needs.

Besides the bare LOD, curators, archivists and cultural institutions need tools and platforms to publish their data. This can be performed on local servers, managed by the institution itself, but larger, multilingual platforms can be used freely. This is the case of Wikidata, the open data database supported by the Wikimedia Foundation—a non-profit charitable organization dedicated to encouraging the growth, development and distribution of free, educational content. Wikidata, a query service which supports federated queries, is just the flagship of the several projects hosted on the servers of the Wikimedia Foundation. Such projects are used by several prestigious institutions in the cultural and artistic fields. They are formidable collaborative tools that use data published under a free license, the most restrictive of which is Creative Commons BY-SA. The hosted data are of different nature and come from various sources. They include donations from cultural institutions, photographs uploaded by the users themselves and works in the public domain because

of their age. The projects are animated by a vast community of users, who give their time for free culture (in the sense of free access, but also available under a free license). The Wikimedia platforms and tools are particularly well suited to the implementation of an open data policy in cultural institutions. Thanks to the licenses and the standard data formats, the contents are easy to share and reuse. The tools are free of charge and all the technical maintenance and software updates are provided by the community. The institution can then devote itself entirely to the publication and uploading of content. Getting involved in Wikimedia projects requires efforts to master the tools, understand the rules and prepare the content, but in return the benefits are great. Integrating the cultural resources in the Wikimedian ecosystem offers the opportunity to enrich the data linked to other contents produced by the international community. At the musée Saint-Raymond (MSR), Wikimedia platforms entered as part of the collection's publication workflows. Wikidata, Wikimedia Commons, Wikipedia and Wikisource are all projects of the Wikimedia Foundation that we will describe below; thanks to their interconnected design, they offer very effective support to integrate local data and resources to the linked open data wider ecosystem.

3.1. The Museum Saint-Raymond (Toulouse, France)

The musée Saint-Raymond, the archaeological museum of Toulouse, opened in 1892, and is located in a former medieval college near the Basilica Saint-Sernin, in the city center of Toulouse, France. Due to its small size, only 800 objects out of the 30,000 listed are shown to the 65,000 visitors that come to the museum every year. So many objects are preserved in the museum storage and only visible during temporary exhibitions or in digital format. The collections exhibited on the second floor, which cover periods from the protohistoric, antique and medieval ages, host artifacts found in the Toulouse region. The first floor is dedicated to the roman sculptures from the villa of Chiragan, in Martres-Tolosane, and the basement, a former necropolis, displays Roman epigraphy and a set of paleo Christian sarcophagi. In the store room are preserved artefacts of much broader origin such as Greek, Etruscan or Cypriot artefacts, and a large numismatic fund. The actual collection was built from the one of the original museum of Toulouse, created in 1793 during the French Revolution. It has then been enriched by several purchases from collectors, from donations and deposits from the Louvre. New findings from recent excavations regularly join the MSR, like the archaeological material from the Visigothic necropolis of Seysses that arrived in 2020 and part of which was exhibited to the public in the same year.

3.2. Moving to an Open Data Collection

The museum Saint-Raymond belongs to the city council of Toulouse. On one side, the French law setting open data by default for the public administration, encouraging curators to open their collections to a wider public by using tools and platforms for redistributing and sharing them. On the other side, the culture of open data has been embraced by the MSR way before 2016. Collaborations with WMFr, the French chapter of the Wikimedia Foundation, were already in place through a partnership since 2010, and free access to digital collections was already possible via Wikimedia tools and platforms. *Wikidata* stands out, among the "wiki" projects, as the flagship since it is the database that collects all the information of Wikimedia projects by establishing inter-wiki links, including Wikipedia. Wikidata is open, collaborative, multilingual and, in that sense, a good support to provide catalogues of cultural and creative works of historical and artistic heritage. Through synchronization with *Wikimedia Commons* (an open online repository for photographs published under a free license), graphic descriptions are automatically associated with textual information so that photographs of items in the database (e.g., archaeological finds, statues, paintings and generally any object of cultural or artistic value) can be described and contextualized directly on the image repository. Items in the database are also connected to encyclopedic descriptions, when available, hosted on *Wikipedia*, the free and well-known online encyclopedia.

A free and open knowledge base is used to publish the inventory data of artefacts. To date there are 1630 objects of the MSR described on Wikidata including the main description criteria used in the internal database. The major advantage of using Wikidata is to have a pre-existing environment, constantly a work in progress, created by the international community of users. Since 2016 the templates for describing cultural objects have stabilized. The hesitations of the first contributions, manually made, have now given way to automatization thanks to Open Refine, a very useful tool to import external datasets into Wikidata. Thanks to volunteers from the Wikimedia community, the museum staff performed importation of database items and learnt to master the available tools. In fact, several tools are available outside Wikidata, and were created by a helpful and dynamic community. The necessity to have user-made tools and scripts arose for all these Wikimedia platforms that rely on MediaWiki software, a software now obsolete and with serious limitations when facing the needs of new Internet technologies. These datasets, built off of years of institutional growth and careful work at MSR, can benefit both the institution and the larger community by expanding the semantic web and establishing an institution as a trusted source of high-quality data. The most robust of these datasets have been converted into RDF triples and are shared via an open API or through a SPARQL query endpoint (e.g., https://w.wiki/34Hg, for the items from MSR). Matching linked open data requirements also enable users to have greater accessibility to the data, while this access is lighter and easier to handle for the hosting institution. A similar approach has been tackled, for instance, by the Library of Congress and The Hungarian National Library: two national libraries that have released their datasets as open linked data. The former to maintain the value of their already well-used cataloguing information, and the latter to promote their more siloed collection to an international audience. Once the artifacts in the collections are described as items in Wikidata, it becomes really easy to upload photos of the corresponding objects in the media library Wikimedia Commons and to automatically generate the relative metadata for the photos in order to facilitate future search and classification. The number of files uploaded by the museum amounts to 2500 (see https://commons.wikimedia.org/wiki/Category: Media_contributed_by_the_Musée_Saint-Raymond_of_Toulouse) and the total number of files concerning the collections made by both the institution and the volunteers reaches at least twice this amount in 2021 (see https://commons.wikimedia.org/wiki/Category: Collections_of_Mus%C3%A9e_Saint-Raymond). These images are available for reuse for any purpose, even commercial. Using a free license bypasses the hindrance of photo agencies, which maintain commercial right to their works, even if performed for a public institution. The more photographic material is available under a free license, the more historical heritage is disseminated and the more the institution carries out its missions of knowledge transmission while consolidating its reputation as a source of information. One of the first uses of data uploaded on Wikimedia Commons is illustrating Wikipedia articles (e.g., https://fr.wikipedia.org/wiki/Catégorie:\T1\OEuvre_conservée_au_musée_ Saint-Raymond). Mainly, such files are used for history articles, emperor's biographies and to illustrate archaeological excavations, but also articles about the collections' objects created by the team of the museum or by external contributors. Some of them have been translated in other languages, amplifying the notoriety of the subject. The Wikimedia platforms are not the only places where the MSR expands its collections as open data. The 3D models of some artifacts are available on the Sketchfab platform under CC0 license. In that way, MSR takes part in the public domain cultural heritage project exactly in the same way as some of the major museums involved in open content (See https://sketchfab.com/museesaintraymond). Publishing collections on 3D platforms is a way to reach a new community, with a different usage for free contents than Wikimedia. Such usage is much more centered on creativity. Cultural heritage then becomes the raw material for new productions in artistic contexts.

In 2019 the MSR reused all the structured material for digital publication. The objective was to edit a new catalogue of the roman sculptures from the Villa of Chiragan in Martres-Tolosane. The Villa of Chiragan is a Roman villa where, among numerous sculptures

and splendid marble decorations, about 600 statues and carved fragments of very fine manufacture have been unearthed [6] and one part is now exhibited on the 1st floor of the museum. Based on the Getty model, the publishing chain developed by two French academic researchers, Antoine Fauchié et Julie Blanc, relies on open-source software and of course all the contents (images, data, and texts) are downloadable and free to reuse (Catalog of the Sculptures of the roman villa of Chiragan: http://villachiragan.saintraymond.toulouse.fr/en/). The ecosystem of the publications and reuses of artifacts from MSR is illustrated in Figure 1.
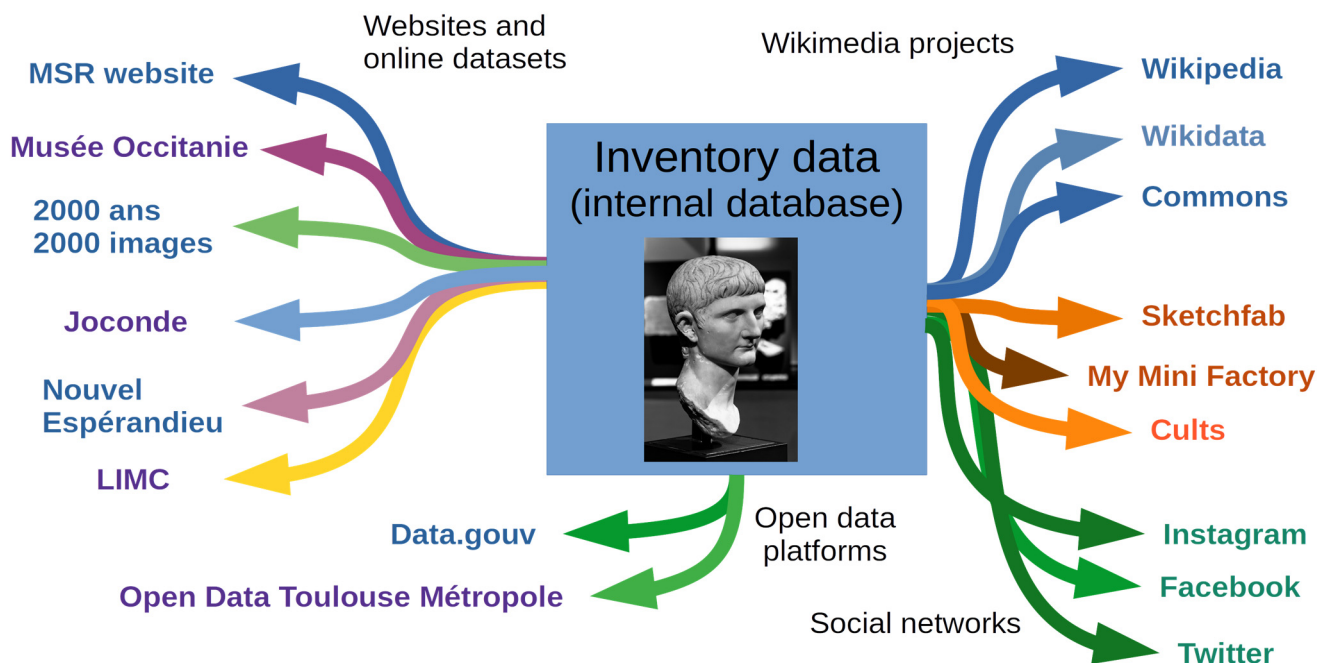
Figure 1. Artifact from MSR and how it is connected to different online platforms.

3.3. Pre-Existent Tools and Their Integration

Contributing to Wikimedia projects cannot be carried out separately from other dissemination activities. MSR collections are published on "Joconde", the French museums' national database managed by the Ministry of Culture, via the POP platform. Each Joconde ID is linked to the corresponding Wikidata item as the primary source. In return, the Wikidata ID is linked to the Joconde record as an open data extension. Wikidata also serves as a connecting hub for all the digital resources about an artwork, including links to all the items in the databases where it is published (Joconde, Arachne, NESP, CIL, Artefacts, Sketchfab, etc.), giving coherence and visibility to disseminated information.

Of course, such integration needs an upstream work in uniformizing the vocabulary of each database, as each one lies on a different structure and ontology of types. This work is performed on the names of the peoples, the geographic locations, the time periods, the materials, the techniques and other keywords used to describe the artifacts. This vocabulary harmonization is held at MSR thanks to the alignment process that enables matching distinct reference systems and connecting knowledge repositories disseminated over the web. To do so, the existing national repositories designed by the Bureau de la diffusion numérique des collections, Service des musées de France at the Ministry of Culture, are exploited. These scientific vocabularies were initially intended for the data in the national collective catalogue Joconde, to which the MSR has also contributed since 2016 [7]. They are published under the CC BY-SA license; they are published on the GINCO application (http://data.culture.fr/thesaurus/) as part of the French program Harmonization of Cultural Data (HADOC). The process of vocabulary alignment, and the associated tools, is an active research field that studies methods and techniques to generate

alignments automatically. The approaches are generally hybrid, combining different methodologies, with the aim of identifying similar concepts in different vocabularies, with all the issues bound to the heterogeneity of sources, and the different dimensions of the vocabularies themselves [8,9]. Discussing all the involved techniques, however, goes beyond the aim of this paper.

4. Towards a Free Online Catalogue

Eventually, vocabularies, such as those of the Getty or of the Joconde database or of the MSR, are matched with their corresponding Wikidata item that ensures their integration in linked open data projects. In fact, LOD can take advantage of the unified datasets interconnection. Datasets can be matched, giving the opportunity to convert a basic catalogue of cultural heritage into integrated datasets, interrelating communication artifacts without needing the interpretation of an archivist, curator or librarian. LOD gives the opportunity to disseminate the collections of cultural heritage institutions, placing them in multiple contexts by pairing them with different LOD sets from around the world. This ability empowers users to use the data for their own research, mapping within their own metadata, at no cost [10].

Similarly to the users, which build new cultural heritage artifacts by combining collections from different sources, museums can create an online and custom-made catalogue by gathering data from various sources. In 2020, Shonagon, a Wikipedian very involved in French GLAM (Galleries, Libraries, Archives and Museums) projects, developed a portal called Palladia that provides multilingual access to more than 1200 objects of the MSR collection published on Wikidata and Wikimedia Commons. This interface is a variation of the search engine for visual artworks, Crotos, which includes more than 330,000 items from all over the world.

The experience of MSR helps going beyond viewing a single collection, but aggregating data from various sources permits us to connect data together and perform actual data analysis.

Following the same idea, the open-source Aton framework is a system that DigiLab Sapienza University of Rome is developing in support to the National Research Council for developing Web3D apps aggregating data from various sources (photogrammetric 3D acquisition, 3D scenes and objects on the Web, archaeological sites data, etc.) to create 3D environments aimed at creating immersive experiences for cultural heritage (ATON framework, Bruno Fanini, Zenodo, doi:10.5281/zenodo.4618387, 2020).

5. Conclusions

In several countries there is still a certain diffidence towards the opening of museum data and information. Italy is a clear example of a country still grabbing on to retrograde policies: these practices are linked to the problem relating to the reproduction of cultural heritage, despite some pioneering examples [11]. For instance, it is possible to photograph and publish photos of the finds kept in the Museum of Villa Giulia in Rome under a free license, making part of the archaeological collections freely accessible (https://commons. wikimedia.org/wiki/Category:Museo_nazionale_etrusco_di_Villa_Giulia), thanks to the Wiki Loves Monuments campaign in 2018. The heavy limitations relating to the reproducibility of the Italian cultural heritage, even by photographic means, have been partially overcome with Law no. 124 of 12 August 2017, which brought to completion the "revolution" that the so-called Art Bonus (Legislative Decree 31 2 May 2014 n. 83) had initiated in May 2014: that is, the possibility for individuals to freely reproduce and disseminate images of cultural assets without requesting prior authorization and free of charge, provided that there is no "profit". This type of no-commercial license strongly limits the spread of knowledge and is refused by Wikimedia projects, which are in turn oriented towards a complete and free dissemination of knowledge and cultural heritage. While in many states it is seen as an opportunity to increase the impact of the cultural heritage itself, in Italy, on the other hand, publishing photographs of the historical heritage is seen as a detrimental

right against the State, despite the fact that the low level of revenue deriving from the sale of rights has been demonstrated several times (https://espresso.repubblica.it/idee/2021/04/08/news/musei_italiani_leonardo_da_vinci-295522990/).

During the first phase of COVID-19 there has been a notable change worldwide. Faced with the crisis, museums have acted swiftly to develop their Internet presence and continue to maintain contact with their public: UNESCO (https://unesdoc.unesco.org/ark:/48223/pf0000373530) has identified more than 800 actions, above all linked to the virtual museums of classical conception, created thanks to the investments made before the pandemic, with the transformation of many of the museum activities planned this year, including exhibitions, conferences and ongoing outreach activities, in online events. The MSR is used to organizing workshops around its exhibitions in the museum's library. In March 2020, as France was beginning its first lockdown, the editathon about the exhibition Visigoths, Kings of Toulouse was held online (https://outreach.wikimedia.org/wiki/GLAM/Newsletter/March_2020/Contents/France_report).

In Italy, the School of Cultural Heritage and Activities Foundation—a training and research institute dedicated to the care and management of cultural heritage—presented a survey during LuBeC 2020 on possible post-COVID-19 scenarios (https://www.fondazionescuolapatrimonio.it/ricerca/musei-in-visibili-covid-19/); a list of the priorities on which take action to remedy the risks focused during the investigation. In the first place it came to "Promote the use of museums and peripheral sites". Peripheral sites are considered safer thanks to the minor crowding, compared to the most famous and popular spots in the big tourist cities, but this yields to create and strengthen networks and systems between ministries and cultural heritage institutions, universities and so on. This very same survey reported, as the second most important need, to "Strengthen the digital training of personnel", associated with the need to integrate real and virtual experiences, to update the fittings and services to the visitors, taking into account the new needs that have emerged and the advantages deriving from the sharing of cultural content. Promoting the collections of the museums, even the small ones, goes through a greater involvement of the public and of the territorial community, based on what is also enucleated by the Faro Convention.

The promotion of the open content policy is mostly carried out by the community manager of the MSR on social media (Instagram, Twitter, Facebook) to encourage the reuses and to ensure a constant presence in the artistic and cultural landscape of the collections, while collecting and reporting new acquisitions. The forceful distanciation from COVID-19 crisis also shed light on a need to reform the cultural and historical offering. This has been underlined by a survey conducted by Intesa San Paolo and Ipsos (https://group.intesasanpaolo.com/content/dam/portalgroup/repository-documenti/eventi-e-progetti/progetti//I%20consumi%20culturali%20degli%20italiani%20ai%20tempi%20di%20Covid-19.pdf): an interesting behavior emerged both from habitual users of culture (i.e., those who normally participate in at least four cultural activities a month), especially of the "neophytes" (i.e., those "who have approached the world of culture since the lockdown). Although 24% of the sample replied "I did nothing" to the question "How did you make up for the inability to use the live from your favorite cultural events/activities?", 53% sought new ways of cultural enjoyment remotely. Digital resources have therefore assumed a key role in cultural fruition during lockdown: they implemented the possibilities—filling a void in many cases—and expanded the cultural audience involving new users, less used to cultural activities, but who have found a moment of experimentation and discovery in the lockdown due to COVID-19, an opportunity that has simplified and made the enjoyment of culture at any time (for 68%) and in any place (53%), as well as one family sharing, capable of bringing children closer to culture (30%). The growing demand for culture via the Internet has led to an unprecedented opening on the part of the Italian public administration, normally suspicious of content sharing as it sometimes lacks the same digital infrastructures to build a series of content dissemination tools, from web portals to digital catalogues. There has therefore been a multiplication of popular videos conducted by mu-

seum curators, 360-degree navigation or virtual museums, and to a small extent also with regard to the opening and sharing of data. These activities joined a global trend towards sharing cultural open data, providing a richer database for research, both to scholars and to a wider, more general audience. Having a more open, freely available, and interconnected offer of cultural heritage information appears to be the new way of sharing knowledge, and increasing the public of institutions. The "Survey on the impact of the COVID-19 situation on museums in Europe" performed by the Network of European Museum Organizations (NEMO) which documented and analyzed the economic impact of the COVID-19 crisis on museums, has led to recommendations for reviewing and restructuring the museums, in order to weather future storms (https://www.ne-mo.org/fileadmin/Dateien/public/NEMO_documents/NEMO_COVID19_Report_12.05.2020.pdf, Survey on the impact of the COVID-19 situation on museums in Europe, Final Report, NEMO, 2021). Even if the majority of the museums in Europe have been closed during the lockdown, and have lost an average of EUR 20,300 a week due to closure and travel halt, two out of five museums reported an increase in online visits, ranging between 10 to 150% during the reporting time. Without any effort, there is no increase in the number of visitors: the museums that were able to adapt staff tasks and/or add resources were also able to increase their digital services and observed an increase in their online visits. A novel, modern and effective new open data policy for cultural heritage institutions, such museums, libraries and academies, does not only concern the way the information is put online, but also its structuring and the interconnection methodology. The transparency of algorithms, native in the open-source community, is a recent need both of the industry and of the public institutions which request a certain level of ability to explain automated decision-making. Structuring the open data offer goes through investment in digital cultural heritage, which is strongly linked to open source, open content, openness and free licenses that encourage reusing and dissemination by a more involved public. These recent observations, repeated in the NEMO's recommendations for increasing the success of museums during and after a major crisis, yield a diversification of the services provided. This goes through an international collaboration through open and linked data. In a global context, such a transition, already adopted before the storm hit by some museums and governments, needs to adopt open data and free licenses in order to allow the public to be part of preserving the (digital) cultural heritage, while disseminating it as their own.

The hope is that that of the MSR can be a virtuous example to be replicated in as many cases as possible, each time improving methodologies and methods of preservation, adaptation and release of their collections. The aim is increasing the impact of free culture both towards institutions, researchers, and the community of citizens and territories.

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