

Pandemic-driven shifts of GLAMs finances and participatory practices:

**Digital policy and
management trends in Europe**



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Pandemic-Driven Shifts of Glams Finances and Participatory Practices: Digital Policy and Management Trends in Europe

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EXECUTIVE SUMMARY

As digital technologies and online tools have become omnipresent in our everyday life, it is not surprising that they have found their way into cultural organisations missioned to preserve our cultural heritage, such as Galleries, Libraries, Archives and Museums (GLAMs). This document explores digital policy and digital management trends in European GLAMs with the view to (a) increase our understanding of how digital work and tools have been embedded in the work of memory institutions and (b) to identify any pandemic-driven shifts that can inform future challenges and opportunities for the sector, particularly in relation to participatory practices and financial resilience.

GLAMs' 'digital practice' includes those aspects of work within GLAMs that are performed through digital tools or realised on digital platforms (Sanderhoff, 2014). They include the development of collection databases and digitisation of content, digitally-enhanced interpretation and curation of exhibitions and materials, as well as GLAMs' digital presence (websites, social media) and digital offer in the form of online events, podcasts, virtual courses and other outreach activities. Over the past two decades, memory institutions across Europe have set out to digitise and share their imagery of museum artefacts, works of art and audiovisual archives through online digital infrastructures (e.g. OpenGLAMs, Europeana) or non-for-profit public-private partnerships (e.g. Google Arts), providing increased access to her visitors' engaging the public in novel ways through special software and tools facilitating on-site and online visitors experiences (e.g. virtual tours, 3D representations, interactive games). However, as digital work is costly and labour intensive, national large-scale institutions were better positioned to harness their digitalisation potential as compared to peripheral, medium or small-size cultural organisations. Prior to the pandemic, less prominent GLAMs were less agile to make sharp transitions to the digital realm due to limited resources and knowledge; a trend that seems to persist after the pandemic. They were driven to engage in digital work mostly to increase their visibility (NEMO, 2020a), often creating digital content as an online version of a physical exhibition (King et al., 2021).

Prior to the pandemic, the digital transition of GLAMs was largely dependent on their organisational size and, by extension, on their digital capacity and resources at hand. Thus, pre-pandemic digital investment became a critical factor for digital preparedness in the sector during the pandemic, by drawing on existing digital material. The forced closure of memory institutions brought to the fore existing issues in the sector, such as 'lack of digital tools, gaps in skills and human capital, poor audience diversity, and weaknesses in coping with the digital transformation, and called attention to data collection and management' (Dimitrova & Chatzidamianos, 2022: 37). Interestingly, there is limited data to support that GLAMs' augmented online presence during the pandemic was accompanied by related increases of digital budget or labour force at

organisation level. Rather, some preliminary evidence suggests that after GLAMs' re-opening, pandemic-driven shifts did not maintain their digital 'momentum', apart from a sustained increased activity in social media. On the positive side, some early findings show that the pandemic did indeed accelerate digitisation and sharing of cultural data on aggregators, such as Europeana, where volumes of digital records substantially increased for several European countries during and after the pandemic crisis.

Regarding the post-pandemic digital landscape for the GLAM sector, a recent survey by Mowat et al. (2022) reports that only 20% of European GLAMs have distinct online/virtual audiences whereas only 2 out of 10 have devised a comprehensive strategy for digitising and cataloguing their collections, licensing and copyright, or general operations and management of their digital efforts. The lack of a solid digital strategy and vision coupled with understaffing and underfunding for several memory institutions expose some structural problems and challenges to realising the sector's digitalisation potential. Furthermore, collections' digitisation remains disconnected from an overarching participatory strategy across many GLAMs operating in the sector (Tartari et al., 2022). As argued, in the post-pandemic era, further institutional support, resources and knowledge is still required so that best practices for engaging with digital audiences can become standardised in the sector and across smaller organisations that hold digital collections. In this way, 'going digital' would not be confined to a process that replicates the typical museum-audience relationship but will be seized as an opportunity for working towards a radically different relationship with user communities.

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ACRONYMS ANS ABBREVIATIONS

API	Application Programming Interface
CC	Creative Commons
EU	European Union
GLAM	Galleries, Libraries, Archives and Museums
ICOM	International Council of Museums
ICOMOS	International Council of Monuments and Sites
NEMO	Network of European Museum Organisations
PPP	Public-Private Partnership
UNESCO	United Nations Educational, Scientific and Cultural Organisation

1. Introduction

1.1 Purpose and scope

In the first two decades of the 21st century, new digital means and internet technologies had brought a revolution to the ways that cultural goods can be produced, accessed, enjoyed, and valued (Wright, 2022). Digital and online practices in the culture and creative sectors had soon diffused across heritage and memory institutions, such as galleries, libraries, archives and museums (henceforth, GLAMs), facilitating new modes of conservation, archiving, audience engagement and participation.

The recent COVID-19 pandemic crisis seems to have given new impetus to the digital turn of the sector, as ‘going digital’ became a one-way road for securing GLAMs’ continuity or even survival. Based on available evidence, the pandemic has caused a massive and lasting disruption to the GLAM sector. Since March 2020 and during the timeline of the coronavirus outburst, more than 90% of GLAMs in Europe were forced to temporarily close their doors to the public for an extensive period of time (UNESCO 2020:13)¹. **The pandemic shock had a tremendous impact in terms of economic losses during the lockdown periods², contributing further to the economic uncertainty and financial fragility of many small and medium-sized GLAMs in Europe.** At the same time, it served as an opportunity for rethinking the role

¹ According to UNESCO (2020:13) data, 94.6% of Western Europe and 98.7 % of Eastern Europe museums were affected by temporary closures during the pandemic crisis.

² In line with Tartari et al. 2022, we identify three lockdown periods; (1) spring 2020, (2) fall 2020 and (3) spring 2021).

of memory institutions³ in contemporary society and for revisiting issues of access and participation.

Long before the pandemic, scholarly work falling under the ‘umbrella’ of Museum Studies and Heritage Studies had systematically raised issues of social relevance, access and participation in the content and processes of ‘producing’ the past in the present (e.g., through works of art, monuments conservation, archives collections). Today, European cultural policy promotes participation not only as good sectoral practice but as a key component of GLAMs’ work for both ethical and pragmatic reasons, such as increasing diversity, representation, and social innovation (see for instance, the New European Agenda for Culture, European Commission, 2018)⁴. Towards this end, **digital technologies open-up new opportunities for GLAMs’ responsiveness to the persistent challenge of participation**, equipping GLAM professionals with novel tools to realise the participation ideal.

Sectoral demands for **financial sustainability and greater participation are** not new but rather **chronic challenges for GLAMs**. Nonetheless, in the aftermath of the pandemic disruption, **both these issues have re-emerged as matters of urgency in the post-pandemic era**. It is perhaps no hyperbole to

³ Note that throughout this document we are using the terms ‘GLAMs’ and ‘memory institutions’ interchangeably. Conventionally, ‘GLAMs’ represent a broader category of institutions that deal with both cultural heritage and with contemporary art and culture. However, in the context of our research the two terms are used as synonymous because we are interested in non-for-profit organisations, whose purpose is to protect, manage and ‘produce’ the past in the present in the service of society (as opposed, for instance, to contemporary art, for-profit galleries that lie beyond our scope).

⁴ For an extensive discussion into the historic development of the participatory ideal in the sector, please see GLAMMONS’ Deliverable 1.1 and Deliverable 1.4.

say that failure to address them promptly and effectively can jeopardise the future of many small or medium-scale institutions. To inform organisational practice and related policy, it is thus necessary to explore whether and how **digital production and management practices have assisted GLAMs to adapt by safeguarding valuable resources and embedding their work to their social surroundings and communities**, while also observing the degree to which the pandemic has served (or can serve) as ‘accelerator’ for a digital shift and adaptation to the post-pandemic era.

Set against this backdrop, the present report sets out to map the ways through which memory institutions have so far engaged with digital means to produce and distribute their services to the public (also, engage with it and enhance its participation) and what policy developments in the EU may have laid the ground for a ‘digital turn’ in the sector. Our analysis covers the periods prior to, during and post the pandemic, placing emphasis on (a) digital tools’ capacity to provide GLAMs with **cost-effective solutions and/or additional streams for value generation** and (b) the **connection between digital practices and issues of access and participation**. This allows us to identify any ‘pandemic-driven’ shifts to the sector’s digital behaviour or even a pandemic-driven ‘acceleration’ of cultural heritage digitalisation⁵.

By exploring GLAMs’ digital responses prior, during and after the COVID-19 pandemic, with emphasis on financing and participation, we mean to

⁵ For a definition of ‘digitalisation’ and its distinction from ‘digitisation’, please see Section 2.1 (p. 17).

reflect on their ramifications and potential for reaching out to wider audiences, reflecting on how they could contribute further to GLAMs' societal mission in terms of social relevance, cultural representation and quality public service, identify major post-pandemic challenges for memory institutions 'going digital' and inform management responses and future policy for GLAMs towards greater openness and resilience.

The analysis and results reported here are based on the collection and review of the extant literature and secondary data. Our review draws on academic publications, such as books, book chapters in edited volumes and scientific journal articles addressing related questions theoretically or empirically, relevant research reports, grey literature and policy documents. Findings and insights gained through the review of the literature are organised thematically around our questions and aims.

1.2 Contribution to other deliverables

The present study forms part of the Horizon-Europe research project, titled 'Resilient, sustainable, and participatory practices: Towards the GLAMs of the Commons' (GLAMMONS). It is based on the work that was performed for Work Package 1 (WP1), during the first year of the project (M1-M12). Its overarching aim is to explore pandemic-driven shifts of GLAMs finances and participatory practices and how digital tools assisted GLAMs during the pandemic.

The present document is closely related to deliverable D1.1, which deals with participatory practices in the GLAM sector. The present document complements D1.1 by exploring in detail various forms of digitally-enabled participation that have been adopted by cultural organisations operating in Europe. In addition, the present document contributes to deliverable D1.7, which presents copyright and open access in GLAMs. The present document lays the ground for D1.7, D4.4 and D5.4 by mapping the digital landscape and framing practices of producing and distributing cultural work and services online.

1.3 Structure of the document

The present document is organised around five sections. Following its introduction (Section 1), the main body of the analysis consists of three parts (Sections 2-4). The first of these (Section 2) presents the digital landscape of the European GLAM sector prior to COVID-19, exploring European Union policy trends and organisational practices for managing, creating and disseminating cultural data. Next, Section 3 explores the responses of European memory institutions during the pandemic and their digital efforts to continue their work and operation during the unprecedented lockdown and health safety measures that led to the closures of cultural facilities and spaces across Europe for a substantial period of time. The analysis continues with Section 4, where we focus on the 'next day' of the pandemic in order to address the question of continuity of the pandemic-driven digital shifts observed during the crisis. Lastly, the document concludes with some critical reflection on current opportunities

and challenges for the digital future of GLAMs operating in Europe in the post-pandemic era.

2. Policy & Practice for ‘Going Digital’ Prior to

COVID-19

2.1. Understanding digitalisation in the sector

As digital technologies and online tools have become omnipresent in our everyday life, it is not surprising that they have also found their way into cultural organisations with a mission to preserve our cultural heritage, such as Galleries, Libraries, Archives and Museums (GLAMs). Digital cultural policy, although described by Hylland (2022: 813) as ‘a slow and ambivalent or reluctant revolution’, has been embedded (to a higher or lower degree) in the cultural work of a plethora of memory institutions across Europe to facilitate communication, access, and management. If one wishes to describe the latest developments in the GLAM sector during the past years, it will be hard to exclude digitalisation, as a technological phenomenon⁶ and indeed, an institutional practice.

In general, ‘digitalisation’ as a term describes the ‘digital turn’ that permeates and transforms many aspects of cultural production, distribution and consumption across the cultural and creative industries (e.g. through the mediation of social media and subscription platforms). Digitalisation, as a wider process and phenomenon of ‘going digital’ is not

⁶ The term ‘socio-technical’ also aptly captures digital developments in the sector (see Thylstrup 2019; Quoc-Tan Tran, 2022).

synonymous with ‘digitisation’. Wallace (2020) highlights the distinction between ‘**digitisation**’, as a narrower term which describes the **digital conversion of cultural heritage collections and materials**, and ‘**digitalisation**’, as a much broader idea referring to *the potential* untapped for the sector by processes of making cultural heritage digital.

The present document deals with various components of GLAMs’ digital work that together can help shed some light to digitalisation and its potential for enabling related organisations to cope with current challenges in the sector, such as enabling greater participation and achieving financial resilience. In particular, for the purposes of this document, our exploration of digital processes is narrowed down to:

- the production and distribution of digitised collections and born digital collections⁷,
- the provision of digital services for public engagement (e.g. enhancing visitors’ experiences, co-creation projects etc.)
- the overall management of digital collections and users’ data (including issues of access).

All these make up much of **GLAM’s ‘digital practice’**, namely those aspects of **work within GLAMs that are performed through digital tools or realised on digital platforms** (Sanderhoff, 2014). They include the development of

⁷ We adopt the definition of Stroeker & Vogels (2012: 15) whereby ‘born digital collections’ are those collections made up from ‘digital materials which are not intended to have an analogue equivalent, either as the originating source or a result of conversion to analogue form’. They may include digital images, digital art, oral history, television/radio programmes and other ‘intangible’ objects.

collection databases and digitisation of content, digitally-enhanced interpretation and curation of exhibitions and materials, as well as GLAMs' digital presence (websites, social media) and digital offer in the form of online events, podcasts, virtual courses and other outreach activities.

2.2 European Union digital cultural strategies: Patterns and trends

Examining the European Union's (EU) agendas for promoting digital (cultural) strategies, one can actually discern goals that relate to production and dissemination of cultural digital products, wider engagement of the public and overall management of digital collections across the sector. In this section, we attempt to organise directives and goals into distinct phases that reflect key developments in related European policy during the past two decades. These cannot be considered as clear-cut phases, as the agendas encountered are indeed overlapping, based on the previous directives and experience, and also willing to go forward in the direction of the available technologies and the current trends in data management. However, they provide some indication of priority setting to guide the reader.

Phase 1: Promoting digitisation/digitalisation (2000 onwards)

The first consistent provisions for EU's Information Society Technologies (IST) thematic priority can be found in the Fifth Framework Programme (FP5) sponsored by the EU prioritising research, technological development and demonstration (RTD) activities for the period 1998-2002, on the basis of a set of common criteria reflecting concerns of increasing industrial competitiveness and the quality of life for European citizens

(European Commission, 2014). Among the three thematic categories features the ‘User-friendly information society’ supporting digitisation projects for libraries and archives and the development of easy to use databases, based on the available technologies of the 2000s. Lessons learned from FP5 are reiterated in the eEurope 2002 initiative (Markellou 2023: 3) aimed to develop an integrated action plan focusing on the creation of quality digital cultural content, ensuring equal access, for example, by promoting linguistic diversity in the digital reflection of the European Union.

The IST focus comes back stronger in the FP6 (2002-2006) targeting ‘Technology-enhanced learning and access to cultural heritage’ as one of its strategic objectives. Digitisation and content management for libraries and archives remain a priority whilst there is a growing awareness of the need to communicate cultural material to the public through ‘edge technology’ approaches. ‘Heritage for all and Community memory’ and ‘Intelligent heritage’ are some of the generic (and probably non-implementable) potential headers promoted at the time, reflecting EU’s online dissemination priorities (European Commission, 2006).

The consequential 2006 Recommendation (2006/585/EC)⁸ ‘on the digitisation and online accessibility of cultural material and digital preservation’ once again encourages the mass digitisation of cultural resources as a priority in a structured manner. It generically revisits the goals of online use of the digitised cultural collections for entertainment,

⁸ <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006H0585>

research, and employment, as well as its use in other sectors, such as tourism and education, through the creation of common standards for the digitised content, the harmonisation of rules governing the distribution of digital material between Member States and the promotion to create a common European access point to digital cultural content. In the 2006 Recommendation, digitising cultural resources seems to be the overarching goal.

Phase 2: Strengthen accessibility (2011 onwards)

In the second decade of the 2000s, there is a marked turn in the digital strategies of the European Commission that follow the publication of the New Renaissance report by the Comité des Sages (EC 2011) and other Directives reflected in the 2011 Recommendation (2011/711/EU) ‘on the digitisation and online accessibility of cultural material and digital preservation’. The Recommendation brings to the foreground the problem of access and the need to place and keep the digital content created in the public domain, highlighting the case of orphan works and the strengthening of licensing mechanisms for the digitisation and access to out of print works. The Recommendation makes provisions for the further development of Europeana, already established in 2008, making the point that any public funding for digitisation projects should be conditional on the availability of digitised material on Europeana. The 2011 Recommendation reiterates the need for common digitisation standards to be defined by Europeana and encourages the development of national content aggregators.

Phase 3: Boost Open Data (2019 onwards)

The 2011 turn to wider accessibility and openness contains a number of concepts that will become common ground in the following decade. In 2015, the Digital Single Market Directive⁹ focusing on the wider digital realm in the European Union and one of the European Commission's ten political priorities, intended to remove virtual borders, boost digital connectivity, and make it easier for consumers to access cross-border online content. Open data is referred to as a necessary approach towards this goal. The Open Data Directive 2019/1024 sets out 'to maximise the re-use of public data, including public cultural data, to further stimulate digital innovation in products and services, and thus to expand social and economic benefits within the European Union', in an effort to pursue and intensify harmonization of national rules and practices on the re-use of public material, data and information (Markellou, 2013: 5).

Further to that, Directive (EU) 2019/790 on copyright and related rights in the digital single market systematised various provisions on the copyright framework for GLAMs in the digital realm, safeguarding the public domain and providing a clear framework for: the digitisation and dissemination of out-of-commerce works in collections for the benefit of European culture and of all citizens, exceptions for making preservation copies and for text and data mining for scientific research. Finally, Member States were required to ensure that data resulting from public sector funded digitisation projects are aligned with the FAIR principles for research data

⁹ See <https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/digital-single-market-trends-and-opportunities-smes-own-initiative-opinion> (last access 29 August 2023).

management (Markellou 2013: 5). The FAIR principles (Findable, Accessible, Interoperable, Reusable) describe how data should be organised to be more easily accessible, understood, exchangeable and reusable¹⁰.

Moreover, the latest 2021 Recommendation (2021/1970) focuses on the need to update digitisation processes in the light of advanced digital technologies, to accelerate the digital transformation of GLAMs by integrating these technologies and enhance the digital skills of those working in the sector. A common European cultural heritage data space seems to be the new goal in the horizon and the development of a 'European Collaborative Cloud for Cultural Heritage' has been promoted as a new digital infrastructure that will connect GLAMs and professionals across the EU, contributing in this way to the vision and objectives of the Commission.

2.3 Production, distribution and management of digital cultural data

This section **maps the digital landscape in the GLAM sector prior to the pandemic outburst**, describing digital tools and infrastructure that were utilised by memory institutions across Europe during the production and distribution of their content and services, as well as digital practices that were embedded in organisational culture to facilitate management.

¹⁰ See <https://www.go-fair.org/fair-principles/> (last access 29 August 2023).

During the first decades of the 2000s, new digital technologies were integrated in the sector to support and modernise GLAMs' work with cultural heritage, facilitate public access to knowledge and enhance audience experiences with heritage resources and services. In the early 2010s, the spread of digital commons to the GLAM sector could be hailed as a milestone in the digital 'evolution' of memory institutions in Europe and the world. Through the **'Wikipedian in Residence'** scheme¹¹ and the collaborative sharing of GLAM resources by the **'GLAM-Wiki'** community¹² cultural organisations worldwide found a new channel to open their collections, archives, and materials to the public. Openness was promoted as the standard of the GLAM sector¹³ by civil society groups and networks, such as the 'OpenGLAM' initiative for the development of cultural heritage as a commons¹⁴.

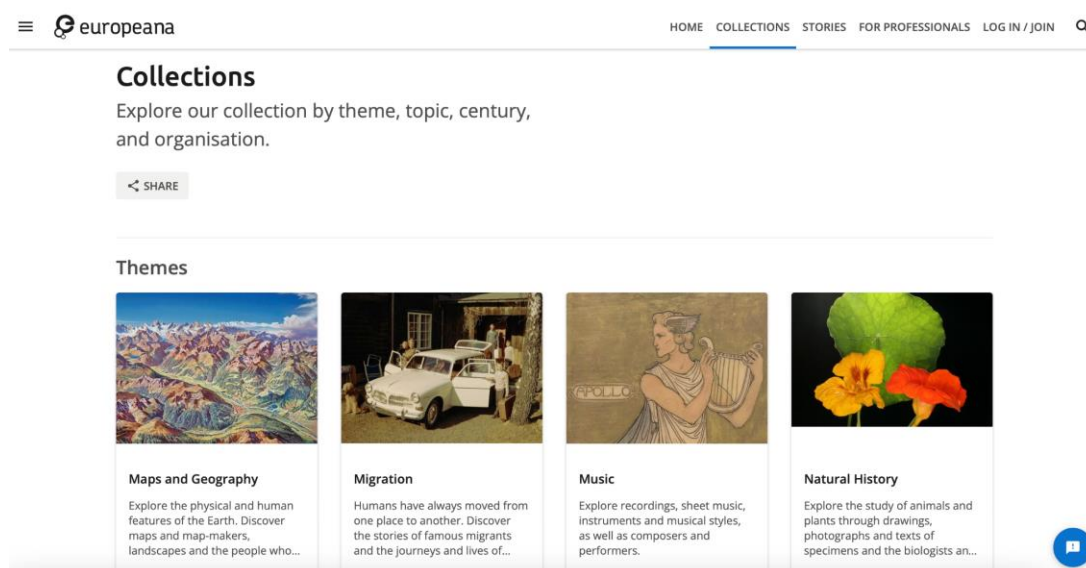


Figure 1 Europeana portal serves as a reference point for Europe's digitised cultural heritage (source: europeana.eu).

¹¹ See https://en.wikipedia.org/wiki/Wikipedian_in_residence (last access 13 July 2023).

¹² See <https://en.wikipedia.org/wiki/Wikipedia:GLAM> (last access 13 July 2023).

¹³ More details regarding openness and open access in GLAMs are provided in Deliverable 1.7.

¹⁴ See <https://openglam.org> (last access 13 July 2023).

Parallel to digital commons, large-scale institutional projects also emerged in the sector. Unquestionably, the **Europeana** portal (figure 1), an EU-led **digital library featuring imagery of museum artefacts, works of art and audiovisual archives**, has been a major digital project in Europe launched in 2008 to provide access to cultural digitised objects, such as books, photographs, films, musical extracts, and maps (European Commission, 2011). Synchronously, at the other side of the Atlantic, a pilot project of the **Library of Congress and Flickr Commons** set out to provide public access to digitised collections of historical photographs (figure 2) whereas the Digital Public Library of America¹⁵, as the US equivalent to Europeana, materialised in 2013 to further promote access to knowledge and heritage resources.

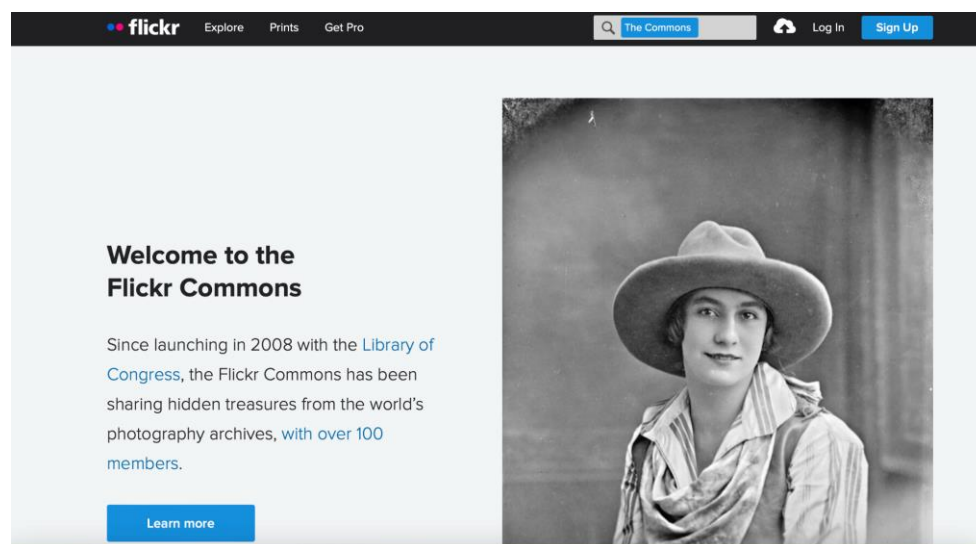


Figure 2 Flickr Commons programme provides access to publicly held photography collections (source: <https://www.flickr.com/commons>).

¹⁵ See <https://dp.la/> (last access 13 July 2023).

In the years that followed, many European heritage and culture organisations have digitised their collections, allowing users to access, comment, share and interact with their resources and content. Along this direction, European cultural policy seeking to enable the sector's digital transformation, mobilised Europeana and other projects and tools to equip GLAMs in Europe with digital service infrastructures¹⁶. Digital common tools and resources, as well as platforms developed by the civil sector or public-private partnerships, such as the Google Arts Project, have also grown and contributed significantly to GLAMs' efforts for going digital.

2.3.1 Collections digitisation: State of play prior to the pandemic

As already mentioned, GLAMs' digital collections are made up of two categories of assets; (a) the physical or analogue objects that have been digitally translated into some visual imagery, such as scanned photographs, 2D pictures, 3D representations and (b) objects that were born digital. Born digital collections, such as digital art, oral history, television, and radio programmes are made up from 'digital materials which are not intended to have an analogue equivalent, either as the originating source or a result of conversion to analogue form' (Stroeker & Vogels, 2012: 15). Depending on their subject area (e.g. media, cinematography, public history, video games), it was common for museums to hold various objects in their collections which were born digitally. Born digital collections constitute a vast amount of resources

¹⁶ <https://pro.europeana.eu/about-us/mission> (last access 12 July 2023)

found in libraries and archives (e.g. electronic journals, grey literature and communication, electronic records, sound recordings).

Survey-based evidence reported by the ENUMERATE network in the early 2010s, suggested that c. 80% of European memory institutions were already engaging in the digital reproduction of their collections (Stroeker & Vogels, 2012: 10). This percentage was even higher for several types of cultural organisations. For example, for all national libraries, for 89% of art museums and for 88% of archives that participated in the survey and had already had some digital collection. However, at that time most of these organisations **had digitised only a small part of their resources and materials (on average, 20% of collections held)**, whereas some sub-sectors, **such as national libraries were lagging behind significantly (only 4% of collections;** figure 3). Regarding digitised objects, most popular types included photographs (64%) and archival records (46%), followed by drawings, engravings, and paintings (35-29%), rare books, maps, and manuscripts (29-28%), 3D works of art and objects (22-21%), audio and video recordings (21%) (Stroeker & Vogels, 2012: 12). Moreover, data from the same 2012 survey suggested that, on average, more than half (52%) of European GLAMs were engaging in collecting originally-digital items and held some born digital collection (Stroeker & Vogels, 2012: 15)¹⁷.

¹⁷ With the exception of art museums and archaeology museums, where expectedly, digital objects made up a smaller percentage of collections.

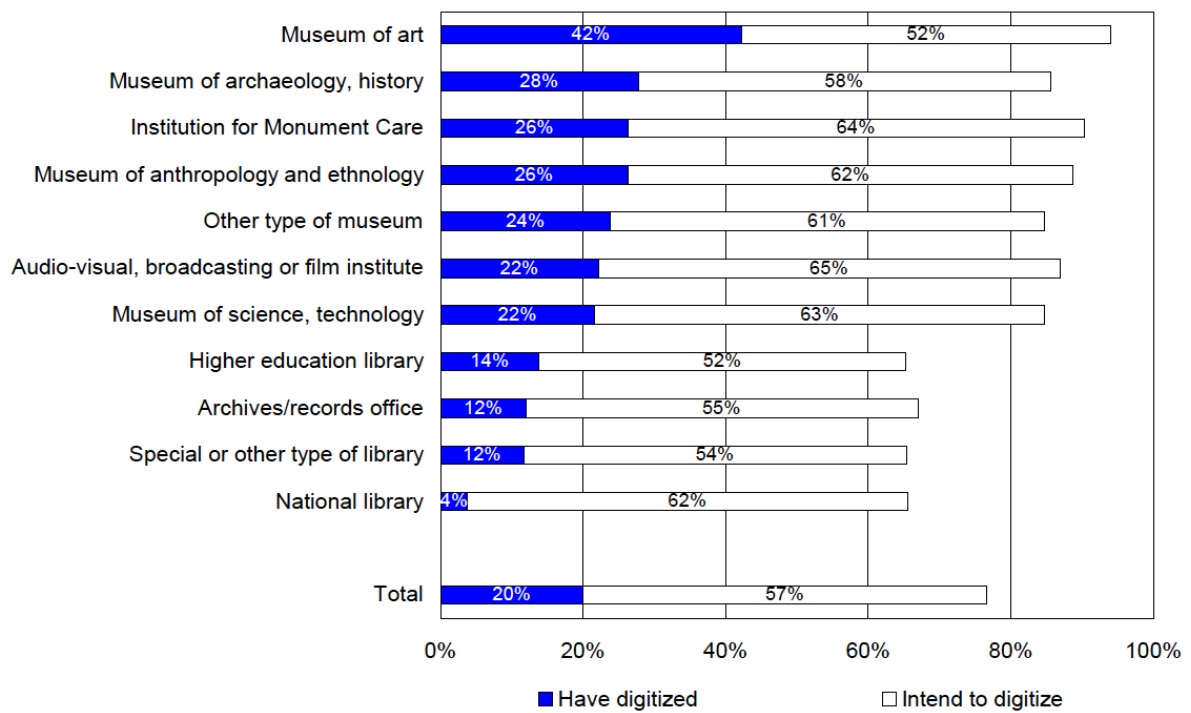


Figure 3 The landscape of digital collections in European GLAMs during the first half of the previous decade, as reported by the survey of Stroeker & Vogels (2012: 11).

These percentages are somewhat understandable given that the digitisation process is particularly intensive in terms of labour, knowledge, resources, and equipment, requiring (UNESCO 2020):

- (i) a thorough and up-to-date inventory of archives, artefacts etc.
- (ii) computer software and hardware infrastructure for photographing, scanning, and processing materials
- (iii) skilled staff that can handle equipment and execute these operations

Thus, especially in the previous decade, larger organisations had higher capacity (e.g. labour, financial resources) to engage in digital work compared to medium and small-size institutions.

Most recent data, collected shortly after the onset of the pandemic (March-May 2020) by NEMO (2020α), provides some indication that the volume of digitised collections held by European museums had risen significantly during the course of the previous decade. In particular, the NEMO survey reports that **the ratio between digitised collections and total collections was on average 43.6%** (NEMO 2020α: 6). This percentage is considerably higher (by 23.6 points) than the one reported by the ENUMERATE 2012 survey (although the numbers are not directly comparable given that the latter also considered libraries, archives, and other types of GLAMs). The NEMO (2020α) study also reported significant variance between different types of museums; those specialising in Art and Design seemed to be well above the average (avg. 65% of their collections were digital), whereas history and archaeology museums (avg. 27%) as well as natural history museums (avg. 15%) had made significantly less progress in digitisation.

Considering the limited survey data that are available, it might be worth examining some complementary statistical information provided by Europeana¹⁸ to help us draw some additional observations regarding collections digitisation trends prior to the pandemic. Our period of interest and statistics reported here span from November 2008 (when the project launched) to February 2020 (i.e. before the enforcement of pandemic-driven lockdown measures). As shown on Table 1, by that time, the Europeana platform hosted about 25 million digital items. **Most of those records have been contributed by cultural institutions located in the**

¹⁸ See <https://metis-statistics.europeana.eu/en> (last access 31 July 2023).

Netherlands (27.6%), Norway (12%) and France (9.8%). Interestingly, more than half of these materials (53%) were texts (c.13.2m), followed by another 46.3% of image records (c. 11.6m). Sound, video and 3D visual data represented a tiny percentage of cultural records that were available through Europeana prior to the pandemic (table 2).

Records by Country		√Count	√Percent
Total		25,030,507	100%
1	Netherlands	6,897,276	27.56%
2	Norway	2,999,884	11.98%
3	France	2,451,694	9.79%
4	Sweden	2,216,098	8.85%
5	United Kingdom	1,786,805	7.14%
6	Austria	1,631,427	6.52%
7	Spain	1,384,453	5.53%
8	Poland	1,312,272	5.24%
9	Germany	1,131,979	4.52%
10	Denmark	957,756	3.83%

Table 1 Volumes of cultural digital records (by country) hosted at Europeana by February 2020 (source: Europeana)¹⁹

¹⁹ <https://metis-statistics.europeana.eu/en/data/country?date-from=2008-11-20&date-to=2020-02-29>

Records by Media Type		√Count	√Percent
Total		25,030,507	100%
1	TEXT	13,213,970	52.79%
2	IMAGE	11,585,582	46.29%
3	SOUND	218,787	0.87%
4	VIDEO	10,548	0.04%
5	3D	1,620	0.01%

Table 2 Volumes of cultural digital records (by media type) hosted at Europeana by February 2020 (source: Europeana)²⁰

Records by Data Provider		√Count	√Percent
Total		25,030,507	100%
1	Naturalis Biodiversity Center	4,511,858	18.03%
2	The National Archives of Norway	2,995,810	11.97%
3	National Library of France	2,072,496	8.28%
4	Austrian National Library	1,499,812	5.99%
5	KB, National Library of the Netherlands	1,305,845	5.22%
6	National Library of Spain	618,163	2.47%
7	The National Library of Poland	608,455	2.43%
8	Swedish National Heritage Board	574,708	2.3%
9	Royal Botanic Gardens Kew	574,019	2.29%
10	Royal Botanic Garden Edinburgh	483,500	1.93%
11	National Library of Denmark	345,519	1.38%
12	Rijksmuseum	337,572	1.35%

Table 3 Volumes of cultural digital records (by data provider) hosted at Europeana by February 2020 (source: Europeana)²¹

²⁰ <https://metis-statistics.europeana.eu/en/data/type?date-from=2008-11-20&date-to=2020-02-29>

²¹ <https://metis-statistics.europeana.eu/en/data/dataProvider?date-from=2008-11-20&date-to=2020-02-29>

Regarding the types of GLAMs that had produced this digital data, Table 2 exhibits the top 12 contributors of that time. On a first glance, one can easily observe **the prevalence of national (large-scale, state-led) cultural organisations**, particularly national libraries (of France, Austria, the Netherlands, Spain, Poland, and Denmark). In the remaining 6 top-ranked organisations, we find 4 museums (the Dutch natural history museum ‘Naturalis Biodiversity Centre’ and the national art and history museum ‘Rijkmuseum’ along with the Royal Botanic Gardens of Kew and Edinburgh in the UK), one national archive (Norway) and a national heritage board (Sweden). This list of course is indicative and by no means exhaustive, providing an indication of the types and size of memory institutions (i.e., national and large size in terms of importance, collections and labour force) that had developed a considerable amount of digital collections autonomously²² and made them available to Europeana, prior to the pandemic.

2.3.2 Channels for accessing cultural data

Digital products are distributed through GLAMs’ own websites or most commonly through aggregators. Aggregators are digital libraries that feature cultural data of artistic work and imagery from multiple GLAMs in the sector. We have already mentioned open access platforms such as Flickr Commons and Wikimedia Commons as well as Europeana. At

²² It would be interesting to compare these statistics with those of Google Art & Culture platform (not available). The Google Arts project also provides financial support for digitising collections and as such, might be more appealing to smaller and peripheral GLAMs, compared to Europeana.

present, Europeana features almost 57 million digital records and is being used as the primary distribution channel for many GLAMs that wish to adopt an open access policy²³. Over the past years, additional aggregators have also been developed at national level often with institutional support or as non-for-profit civil society initiatives. Some notable examples include Art UK in Britain, Deutsche Digitale Bibliothek and Coding Da Vinci in Germany, representing interesting examples of promoting access and creative engagement with digital cultural heritage and GLAMs²⁴, as explained in the next paragraphs.

Cultural data aggregators: Some notable examples

The digital platform Art UK provides free access to digital/digitised artworks (e.g. paintings, sculptures, photographs) from cultural institutions based in Britain along with stories and commentaries. The website features work that is available for reuse under Creative Commons licences, although most of the imagery is still in-copyright, for which Art UK seeks to obtain permissions for image reproduction. It also provides a database of free-to-use school learning resources whereas it employs crowdsourcing to improve search and user experience of the platform and its content. As the organisation reported, the website attracted a total of 4.3 million visitors during 2022 (Art UK, 2023: 4).

²³ For more details, please see Deliverable 1.7, Section 3.1.2.

²⁴ Note that there are also additional international platforms providing free access to cultural data, such as the Internet Archive library (<https://archive.org>) and national digital projects developed outside the EU, such as Japan Search (<https://jpsearch.go.jp/>) and Trove (<https://trove.nla.gov.au/>). However, our focus here remains confined to European territory.

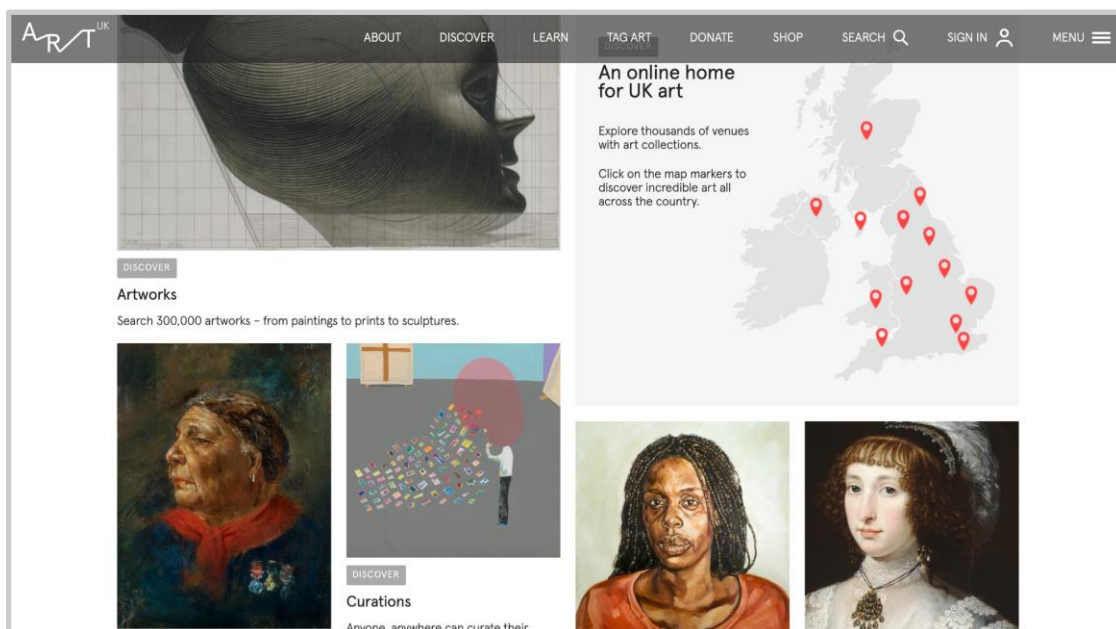


Figure 4 Art UK open data online platform features artwork imagery from thousands of UK-based GLAMs (source: <https://artuk.org/>).

The Deutsche Digitale Bibliothek (German Digital Library) is an online platform featuring collections of diverse media, including books, archives, images, photographs, videos and audios; practically, ‘all you can also find in German museums, libraries, archives and media centres - merely in digital format’²⁵. This digital library serves as a central repository where cultural institutions can contribute their digitised materials in order to facilitate discoverability and free access. So far, about 400 GLAMs have shared their digitised/digital collections, creating a pool of 24 million objects.

The Coding da Vinci initiative²⁶ hosts open cultural data of the Deutsche Digitale Bibliothek and other sources (e.g. Wikipedia, Open Street Map). It

²⁵ <https://www.deutsche-digitale-bibliothek.de/content/blog/willkommen-bei-der-deutschen-digitalen-bibliothek?lang=en> (last access 21 July 2023).

²⁶ See <https://codingdavinci.de/en> (last access 21 July 2023).

has been organising hackathons in order to mobilise developers to creatively work with digital cultural data and build a digital infrastructure for GLAMs. Over the past years, Coding da Vinci projects have focused on linking open data, new data contextualisation, data visualisation, and applications improving knowledge sharing and visitors' experience and engagement, such as city guides, educational games and research tools.

The Google Arts platform

Among the most popular websites for accessing GLAMs collections is the 'Google Arts' project. The Google Arts and Culture platform is **a non-for-profit public-private partnership (PPP)** between the US-based multinational giant and various GLAMs in Europe and the world, ranging from prominent national institutions to small-size peripheral ones. Since 2011 when it debuted, Google Arts and Culture has encouraged museums, galleries, and archives to join the initiative by sharing their content: **digitising their collections, creating virtual tours or walks and digitally curating their content by using Google tools**. Today the platform has attracted about 2,000 partner institutions, including world-famous elite organisations such as Tate Britain, Musee d'Orsay, Guggenheim Bilbao, Benaki Museum and many others.

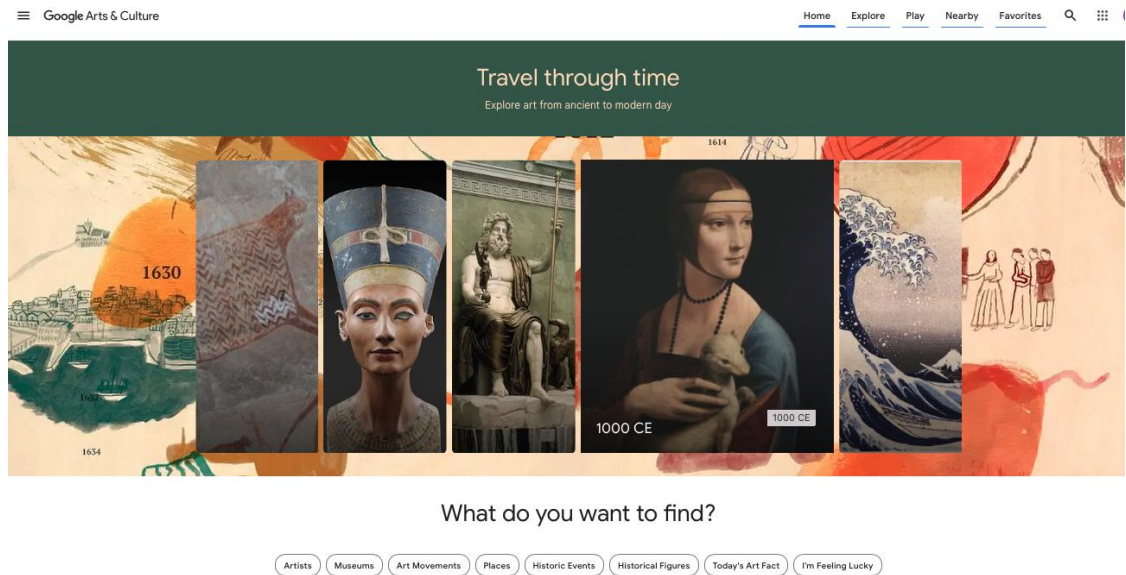


Figure 5 The Google Arts and Culture platform (<https://artsandculture.google.com/>)

On the positive side, the Google Arts project allows state-subsidised GLAMs with limited resources to enter the digital realm and benefit from a globally popular distribution platform. Yet, digital projects nested in private interests, although themselves non-commercial, could still raise some ethical concerns regarding access. For Sanderhoff (2014: 69), participation to the Google Arts platform entails a trade-off for public GLAMs; in practice, the opportunity for museums and archives to mass-digitise their content is exchanged for monopoly control over audiences' interaction with art and heritage resources in digital space. The Arts & Culture project has allowed Google to conveniently 'develop a walled garden' by determining access and channel engagement through the company's own tools and applications²⁷, monetizing users' attention and browsing data while offering a seemingly 'free' service.

²⁷ For further discussion on the issue, please see Deliverable D1.7, Section 2.10 'Digitising cultural data through PPPs: Access ramifications'.

2.3.3 Curation, public engagement, and participation

Admittedly, the digitisation of GLAM collections holds great potential for presenting much more to the public in whole new ways. Digital content enabled GLAMs to reach new audiences that would have been impossible with on-site visits alone. At the same time, it enhanced their potential for making cultural resources available to the public. As suggested by Sanderhoff (2014), due to space and time restrictions, it is quite common for GLAM institutions to physically present/exhibit to the public only a fraction of their collections. Digital space liberates curators from such limitations, creating opportunities not only for **providing access to a quantity and diversity of works of art but also connecting works that are held at various places and organisations across the globe**. For example, the digital project ‘Art Stories’ showcased Danish art by bringing together under common themes artwork from various collections, physically present in five GLAMs; the National Gallery of Denmark, Hirschsprung Collection, Funen Art Museum, Vejle Museum of Art and KUNSTEN Museum of Modern Art Aalborg. However, as Sanderhoff (2014) narrates, the project revealed the critical importance of having free and accessible content in order to create synergies between collections, as clearance of photo rights can become a huge barrier to establishing a network of digital art due to tremendous costs.

Moreover, high-quality digital images allow for close inspection and visual exploration of works of art. **The years preceding the pandemic saw the development and delivery of various free or low-budget tools for developing digital content in the sector.** For example, Europeana provides free access to information materials and hands-on tools for digital development, such as software for building apps (APIs) and platforms for crowdsourcing, editing content, knowledge and metadata sharing²⁸. Metadata are data about digital media, which might be automatically generated, manually created, and/or embedded in using collections data, for example, from the digital asset management system (Wallace, 2020). **Digital exhibitions employ a mix of different media to communicate their content, providing virtual users with relative flexibility and freedom when exploring collections and artefacts** (King et al., 2021). For example, museum mobile applications, such as ‘SMARTIFY’ can scan and provide instant information for works of art, partnering with GLAMs as service-provider for organisations wishing to enhance visitor’s onsite experience, through traditional app uses (e.g. audio guides) or more innovative projects (e.g. augmented reality; see figure 6).

²⁸ See more at <https://pro.europeana.eu/about-us/services-and-tools> (last access 12 July 2023).



Figure 6 Scottish National Galleries started using Smartify in 2019 to provide tours to visitors across its four venues, as well as display works of art through AR technologies hosted on the app (Museums and Heritage Advisor, 20 November 2020)

The advent of Web 2.0 enabled **new modes of open online participation in cultural production, by facilitating and simplifying processes of generating user content**; whereby digital communities can share thoughts, visual materials, creations and knowledge (Tartari et al., 2022). In fact, incorporating user perspectives and engaging with social Internet culture is quite critical for remaining relevant and often a prerequisite for securing state subsidies (Sanderhoff, 2014). These new modes of open online participation include (Tartari et al., 2022: 15)²⁹:

- Contributions, whereby users contribute data to a digital project.
- Collaborations, whereby users analyse data under the supervision of the organisation.
- Co-creations, whereby users and organisation work as equals to produce content.

²⁹ This taxonomy complies with Simon's (2010) proposed categories for participatory work in museums.

In this light, digital practices such as crowdsourcing ‘encourages multiple individual interpretations of digital cultural content and facilitates a unique connection between the collections and a network of individuals who are diffusing cultural content across the Web’ (Berbenkova & Karatza, 2022: 27). In co-creation projects, GLAM staff works together with audiences to create content and experiences, often with the help of digital media and tools (Berbenkova & Karatza, 2022). For Sanderhoff (2014: 22), **in the digital era, the principle of ‘openness’ for GLAMs does not merely concern access to digital/digitised assets in ‘technical’ terms (e.g. IPR) but takes a broader meaning, as ‘an open and welcoming attitude’ towards users’ contributions and involvement in the form of crowdsourcing, crowd-curation or citizen science.**

However, despite examples of good digital practice, Saldanha et al. (2015: 4) have argued that the curation of digital collections ‘lacked imagination’ as engagement remained ‘focused on information-passing to a small research-oriented audience’ prior to the pandemic. Although important steps had been made to incorporate digital technologies in GLAMs’ work, there were still no standard guidelines for engaging audiences with digital materials. As Burke et al. (2020) underline regarding virtual tours, they seldom provide a digital alternative to the narrative of the physical exhibition. Artworks thus tend to be presented as isolated images, unconnected to the interpretation that situates them in the exhibition narrative across physical space. ‘The opportunity to create new connections through digital interactions is rarely intuitive, and the virtual

visitor cannot deviate from the limited amount uploaded (the Van Gogh Museum's own curated tour only has the ability to zoom in or view interpretation on specific artworks, for example)' (Burke et al., 2020: 118).

GLAMs were driven to engage in digital work mostly to increase their visibility (NEMO, 2020a) but often creating digital content not on its own right but as an online version of a physical exhibition or artefacts, thus rendering it, in a way as secondary or inferior (King et al., 2021).

Small peripheral museums seem less agile to make sharp transitions to the digital realm due to limited resources and knowledge. Organisational culture did often become a barrier by prioritising the more 'traditional' civic roles of GLAMs as institutions whose mission is first and foremost the protection and conservation of cultural heritage material. There seems to be a 'knowledge gap' across the sector, in digital audience management (i.e. reaching and engaging digital audiences), especially in small and medium size organisations, where logistics, labour and financial resources do not allow for setting digital strategies as top priority (Radermecker, 2022).

2.3.4 Digital users and audiences

By reviewing museum professional practice over the past five decades, Parry (2019) organises **the different constructions of 'digital user'** into three main categories. The first category sees the user as a generic and anonymous 'operator', a type that characterizes mostly the early decades of GLAMs computerization (1960s-1970s), which places emphasis on

usefulness and *effectiveness* (e.g., automation) of (internal) organisation processes (e.g., collection information system, inventory system). The second category widens the user spectrum beyond museum specialists to encompass audiences. In doing so, it constructs **the user as an ‘individual’** with diverse preferences and needs, marking a new period of ‘personalisation’, mostly prevalent in the 1980s and 1990s. Here, interest shifts to users’ *experiences* of GLAMs collections and materials, for instance, by harnessing digital tools to accommodate different styles of learning and to enable greater access. Finally, Parry (2019) identifies a third transition of the ‘digital user’, coined as **‘the user as actant’**, emerging in GLAMs from 2000s onwards. In this more recent construction, ‘the driver is no longer efficiency (of the ‘operator’), or accessibility (of the ‘individual’). Instead, it is agency that defines the ‘user’—a socially active user, within a wider world’ (Parry, 2019: 285). As the focus moves to **empowerment and purposefulness of digital users** (including, people with disabilities), GLAMs digital work becomes a ground for creative activity, allowing them to produce their own digital artefacts and content.

This evolution from ‘operator’ to ‘individual’ and eventually, to ‘actant’ does not only reflect the growing digital confidence of GLAMs but also **the sector’s shift towards more visitor-centred, inclusive and socially purposeful practice**, reflecting also the marked transition to cultural heritage management practice considering public’s potential from passive to participatory and recently to co-creative (ICOM, 2020; Dragouni & Lekakis, 2023). Today, it might be safe to say that these different ‘conceptions’ of the

digital user co-exist across the sector, as overlapping modes of digital curatorial and managerial practice in cultural organisations on different occasions, rather than as static clearly-cut categories. Still, the changing meaning of GLAMs' digital user as mapped by Parry (2019) is useful for increasing our understanding of the alternative framings of digital practice within the sector. It also shows that as the idea of 'digital user' grows in maturity, users come to be seen as 'individuals' and then as 'actants' by those organisations that engage in digital work, in turn **promoting a more audience-driven agenda that cherishes accessibility, purposeful participation and users' agency.**

From the aspect of the user/audience, the integration of digital technologies in GLAMs work has opened up new ways of interacting with heritage and culture in physical and digital space. As on-site visitors, they are now often presented with content in many different ways; in museums for instance, a case exhibiting an object referenced by a short-text label can be accompanied by 'an interactive that allows a visitor to learn more about the concepts surrounding the item, an app that explains the connecting concepts that reference the collection item or translates to other languages, a voice-based technology that answers visitor questions and a myriad of other existing and emerging technology examples', **catered to fit with one's age, cultural background and level of interest in the subject** (Devine & Tarr, 2019: 298). Moreover, as virtual visitors, users can employ digital tools to see various details of an artwork, juxtapose and compare different items, explore interpretative content (Davine & Tarr, 2019) or even

develop their own personal digital collections, through online social environments that allow users **to ‘contribute their thoughts to the knowledge base of the institution’** (Marty, 2011: 217).

Moreover, the proliferation of digital archives, digitised collections, virtual museums and art galleries **produce a cultural space for the emergence of new types of community formation** that make the links between community and heritage more visible (Waterton, 2010). **‘Community’ here is understood as a social group that has been brought together by their subjective experiences and the associations that these provoke, rather than by the geographical space they occupy** (Watson, 1997). The discussion is also a marker of how the ‘public’ is considered progressively a nuanced entity, comprised of ‘communities’ of people who have things in common and interact with heritage in diverse but also meaningful ways that need to be understood and appreciated (Lekakis, 2020).

As Lemon (2018: 93) observes in the GLAM landscape, ‘there is a drawing together of networks to produce and explore knowledge, co-curation of experiences and scaffold participatory experiences to engage with objects, spaces and meaning making’. At the same time, some pre-pandemic empirical evidence suggested that participation in GLAMs-based online/virtual community environments was often superficial and limited to a niche of audiences (Marty, 2011). Overall, pre-pandemic sectoral experience showed that **‘when working with particular audiences to involve them in content creation’, GLAMs were better positioned to reach**

and retain users' interest than when developing generic platforms (Marty, 2011: 217). In addition, the engagement of users with GLAMs through social media can provide a flexible environment for interaction with curators, educators and other experts whereas, online platforms at the sector's periphery offer **digital space for networking and professional development for pre-web communities³⁰ or virtual communities of practice³¹**. By engaging in online practices of networking, information searching, content creation and sharing, users construct their own ecologies of learning and identity making (Shaw and Krug, 2013). However, at least prior to the pandemic, some scholars such as Waterton (2011) observed that **self-identified (and often marginalised) community groups, which asserted their presence in the virtual world, were still struggling to find legitimacy in the sector** and were not considered as equally valued and as 'authentic' as offline heritage communities (Waterton, 2011).

3. Digital responses during the pandemic

The outbreak of the pandemic hit the GLAM sector hard. In March 2020, lockdown restrictions and measures for social distancing closed down archives, libraries and exhibition halls of museums and galleries across Europe and the globe, leading to a sudden move online of a plethora of European memory institutions. In this section, we investigate GLAMs digital behaviour during the pandemic and lockdown periods while we also

³⁰ See for instance, <https://blackplanet.com>

³¹ See for instance, <http://www.archaeoseek.com>

seek to identify any shifts in digitisation trends and dissemination of cultural data.

3.1 GLAMs' reflexes during the crisis and lockdown measures.

For NEMO (2020b) digital cultural heritage seemed to be the key for GLAMs proactive response to the COVID-19 pandemic crisis and vital for securing creativity and engagement while keeping their physical premises closed to the public. However, for Dimitrova & Chatzidamianos (2022: 37), the forced closure of memory institutions also brought to the fore existing issues in the sector, such as **'lack of digital tools, gaps in skills and human capital, poor audience diversity, and weaknesses in coping with the digital transformation and called attention to data collection and management'**.

According to UNESCO (2020), the sector demonstrated quick reflexes to the pandemic crisis by enhancing its digital presence and transferring exhibitions, events, and outreach activities to virtual space. **Prominent organisations (e.g. national museums) were able to harvest the benefits and see returns on their investments in digital projects prior to the pandemic**, such as their work on collections' digitisation. These large-scale memory institutions were better positioned to adapt to the pandemic restrictions (compared, for instance, to small museums with little online presence), by mobilising digital resources, tools and web technologies to continue producing and communicating their cultural work online while also claiming an active social role in alleviating grief and providing their

audiences some comfort in times of isolation and high uncertainty (King et al. 2021).

Positive changes and digital trends during the pandemic also include the distribution of digital content that would have remained inaccessible otherwise, as well as **the production of original digital events or live streaming services, that brought at home public talks, workshops, seminars, conferences and art performances.** Researchers such as Radermecker (2022) maintained that the pandemic motivated cultural organisations to supply services enhanced by digital technologies, such as live streaming, QR codes and virtual reality. Furthermore, Noehrer et al. (2021) argued that the coronavirus reversed previous institutional reluctance to digitalisation, encouraging GLAMs to realise their digital potential not only for reaching out to audiences but also for internal processes of conservation and management. However, their observations are based on qualitative data from a very small sample of GLAMs³² and thus, need to be treated with caution.

At the same time, ICOM (2020: 9) stressed that the restrictive measures during COVID-19 **brought to the surface the ‘structural weaknesses that have for a long time affected cultural institutions, in terms of resources and staff dedicated to digital activities and communication’.** ICOM’s survey findings during the pandemic suggested that only 30% of European GLAMs had full-time staff dedicated to digital activities and the majority of memory

³² Interviews with staff from the local authority Manchester Art Gallery (UK), the DCMS-sponsored National Gallery UK) and the Smithsonian institution (US).

institutions dedicated only a small proportion of their budget (about 1-5%) to communication and digital activities.

Based on the aforementioned, we observe that **pre-pandemic digital investment appears as a critical factor determining GLAMs' digital 'preparedness' during the pandemic.** It also seems that **GLAMs' responses** to the unprecedented reality of the lockdowns **were largely dependent on organisational size and by extension, on their digital capacity and resources at hand.**

Furthermore, **GLAMs' digital responses during the COVID-19 crisis have been described as 'instinctive' rather than part of a deliberate strategy** (Kolokytha & Stroom, 2022: 14). In particular, regarding digital behaviour, GLAMs' responses to the pandemic crisis can be grouped into five categories of actions (UNESCO, 2020):

- a) Drawing on *already-available* digital resources, such as digital collections, virtual tours, applications, games, and online publications.
- b) Delivering *already-planned* events online, such as public talks (e.g. through live streaming).
- c) Increasing social media presence and delivering tailored content to Facebook, Twitter, Instagram and Youtube;
- d) Developing original 'lockdown projects', either presenting 'hidden' aspects of GLAMs' work to audiences or encouraging participation and creative engagement (e.g. video games, user-generated art, activities for children; see figure 7);

e) Organising professional/scientific events (e.g. conferences, talks, seminars) dealing with issues/challenges that emerged during the pandemic.

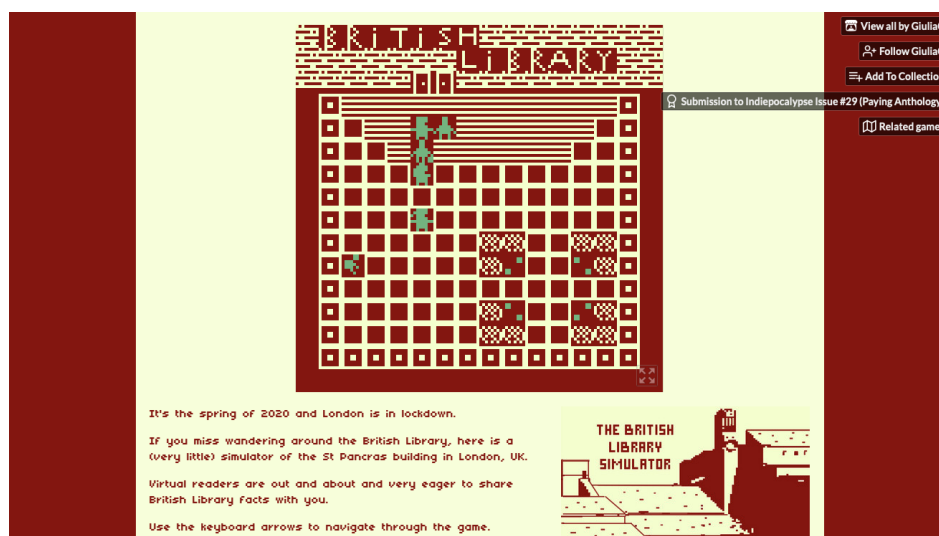


Figure 7 Developed during 2020 lockdown, the British Library Simulator allows users to navigate around a mini version of the library that draws on Atari game aesthetics. Note that the British Library has been a digital pioneer and open data protagonist since the 2010s (source: British Library³³).

Unsurprisingly, **European museums' digital response to the pandemic was predominantly to draw on existing digital material** (UNESCO, 2020: 17), reaffirming our earlier argument of GLAMs capitalising on their pre-pandemic investments. Even more interestingly, the NEMO (2020b) survey reveals that **in most cases, an organisation's augmented online presence during the pandemic was not accompanied by an actual increase to the budget allocated to relevant activities.** This implies that digital responses were made possible by **redirecting staff efforts to online/digital tasks during the pandemic, which raises questions with regards to the continuity of GLAMs**

³³ <https://blogs.bl.uk/digital-scholarship/2020/05/the-british-library-simulator.html> (last access 25 June 2023)

digital offer in the post-pandemic (if, for instance, GLAMs did not recruit new staff after re-opening their doors to the public).

Some preliminary data from European museums provided by ICOM (2020) indicated that **during the reopening of GLAMs³⁴, there were no dramatic shifts of behaviour observed** across organisations that welcomed visitors to their premises. The only exception reported regarded their **social media presence**, which for 48% of institutions participating in the survey sample, had sustained an increased activity (compared to pre-pandemic levels) during museums' temporary opening. At the same time, far less of the surveyed organisations (only 18% and 16%, respectively) reported a relevant sustained increase in digital collections or in virtual exhibitions (ICOM, 2020: 11).

3.2. Pandemic-driven shifts in the volumes of digital data

Regarding collection's digitisation during the pandemic, it is pertinent to observe whether there have been any major shifts across the volume of Europeana digital materials during the pandemic lockdown measures, as an indication of GLAMs' digitisation trends. As already mentioned, Europeana is a central digital infrastructure and a major digital channel for GLAMs that wish to distribute their digital collections and materials. For this reason, in this section we employ Europeana as an indicator to observe any pandemic-driven shifts in the size of digital collections and data.

³⁴ This was in May or June 2020 for most European countries. Most commonly, reopening lasted only for a few months, followed by a second wave of forced closures. See also <https://www.nemo.org/advocacy/our-advocacy-work/museums-during-covid-19/overview-of-museum-reopenings.html> (last access 1 August 2023).

Country	Pre-pandemic period	Mar 20-Feb 21	Mar 21-Feb 22	Pandemic period (total increase)
Austria	1,631,427	160,592	54,844	215,436 (13%)
Belgium	256,131	1,409,850	54,513	1,464,363 (572%)
Bulgaria	23,671	50,464	53,868	104,332 (441%)
Croatia	28,813	2,598	-	2,598 (9%)
Cyprus	20,598	10,746	26,901	37,647 (183%)
Czechia	24,565	8,233	108,838	117,071 (477%)
Denmark	957,756	-	23,876	23,876 (2%)
Estonia	191,128	210	2,308	2,518 (1%)
Finland	81,385	519,081	2,258	521,339 (641%)
France	2,451,694	15,503	63,375	78,878 (3%)
Germany	1,131,979	1,634,873	2,329,689	3,964,562 (350%)
Greece	134,907	151,496	73,423	224,919 (167%)
Hungary	210,981	104,196	3,268	107,464 (51%)
Ireland	69,794	4,736	18,611	23,347 (33%)
Italy	546,494	375,168	325,299	700,467 (128%)
Latvia	83,873	1,906	96	2,002 (2%)
Lithuania	18,848	40,229	22,012	62,241 (330%)
Luxembourg	65,592	-	-	-
Malta	81	-	-	-
Netherlands	6,897,276	441,910	611,153	1,053,063 (15%)
Norway	2,999,884	-	26,840	26,840 (1%)
Poland	1,312,272	1,220,617	227,383	1,448,000 (110%)
Portugal	25,603	1	504	505 (2%)
Romania	117,642	9,168	86	9,254 (8%)
Serbia	27,726	2,632	44,552	47,184 (170%)
Slovakia	8,679	-	6,403	6,403(74%)
Slovenia	55,360	358,042	954	358,996(648%)
Spain	1,384,453	146,981	508,450	655,431 (47%)
Sweden	2,216,098	987,606	424,936	1,412,542 (64%)
Switzerland				317
UK	1,786,805	2,309	43,235	317 (20%)
				45,544 (3%)

Notes:

All data were drawn on the Europeana data statistics dashboard as at 1st August 2023. Pre-pandemic period: from November 2008 (launch of the platform) to February 2020. Data available at: <https://metis-statistics.europeana.eu/en/data/country?date-from=2008-11-20&date-to=2020-02-29>.

Mar 20-Feb 21: conventionally, from 1st March 2020 (given that in most European states GLAM closures were introduced at some point during this month) and for 12 months. Data available at <https://metis-statistics.europeana.eu/en/data/country?date-from=2020-03-01&date-to=2021-02-28>.

Mar 21-Feb 22: conventionally, from 1st March 2021 to 28 Feb 2022, when all European GLAMs had reopened their doors to the public permanently (see footnote 26 in this document). Data available at <https://metis-statistics.europeana.eu/en/data/country?date-from=2021-03-01&date-to=2022-02-28>.

Pandemic period (total): sums of digital assets introduced to Europeana platform during March 2020-February 2022.

Light grey highlights those countries where GLAMs contributions to Europeana were marked by a major increase during the pandemic.

Table 4 Digital records contributed to Europeana by GLAMs (per country), prior to and during the COVID-19 pandemic crisis.

	Country	Pre-pandemic	Pandemic	Increase (%)*
1	Slovenia	55,360	358,996	6.5
2	Finland	81,385	521,339	6.4
3	Belgium	256,131	1,464,363	5.7
4	Czechia	24,565	117,071	4.8
5	Bulgaria	23,671	104,332	4.4
	German			
6	y	1,131,979	3,964,562	3.5
7	Lithuania	18,848	62,241	3.3
8	Cyprus	20,598	37,647	1.8
9	Serbia	27,726	47,184	1.7
10	Greece	134,907	224,919	1.7
11	Italy	546,494	700,467	1.3
12	Poland	1,312,272	1,448,000	1.1

Notes:

All data were drawn on the Europeana data statistics dashboard as of 1st August 2023.

increase represents times, e.g. Slovenia increased its digital records 6.5 times or by 648%.

Table 5 Major shifts in the volumes of contributions to Europeana during the pandemic (by country).

Table 4 exhibits the volume of digital records prior to the pandemic and during the pandemic by country as provided by Europeana statistics, for 31 European states whose memory institutions engage in digital work³⁵. On a first glimpse, we observe three main trends that can inform our enquiry of pandemic-driven shifts in GLAMs digital work:

- a) The pandemic seems to have had little effect on ‘accelerating’ the digitisation efforts of some countries (and their national GLAM sectors) that were already engaging in producing and distributing their cultural data through Europeana, such as Austria, Denmark, France and the Netherlands. In fact, these countries contributed a relatively small volume of resources during the pandemic crisis, compared to their pre-pandemic stock of digital records. Germany and Poland appear as exceptions, as not only they continued to contribute significant volumes of digital assets during the pandemic, but they increased their contributions massively (by 3.3 and 1.1 times, respectively).
- b) In countries, where GLAMs had been ‘hesitant’ to digitise and provide access to their collections through Europeana (as reflected on their relatively low volumes of records in the pre-pandemic period), the pandemic may have indeed served as catalyst. For example, Slovenia, Finland, and Belgium increased their contributions

³⁵ Note that some European countries have been omitted (e.g., Montenegro, North Macedonia, Albania) as their number of digital records remain negligible throughout the study period.

approximately by 6 times. GLAMs in Czechia, Bulgaria, Lithuania, Cyprus, Serbia, Greece, and Italy also exhibited a considerable increase in their digital activity/access policies, compared to their pre-pandemic behaviour (see also Table 5).

c) There are also several countries where we cannot observe any impressive pandemic-driven shifts. For example, Malta, Portugal and Switzerland which had contributed comparatively little data on the Europeana platform, continued to present a small pool of materials during the pandemic. The latter does not necessarily mean that these countries have been generally slow in digitising (e.g., they may use national aggregators or other platforms to distribute data); Europeana is used here merely as an indicator to observe pandemic-driven shifts and not overall progress of going digital.

Next, it would be interesting to also observe GLAMs behaviour after the end of forcible closures as part of health measures during the pandemic. As each European state applied its own policy to reopening its cultural premises (the majority of GLAMs re-opened permanently in May-June 2021, yet NEMO documents several country-specific exemptions of earlier and later openings³⁶), we conventionally set the beginning of the post-pandemic period to 1st March 2022³⁷.

³⁶ See <https://www.ne-mo.org/advocacy/our-advocacy-work/museums-during-covid-19/overview-of-museum-reopenings.html> (last access 1 August 2023).

³⁷ March 2022 marks the reopening of the last national GLAM sector (Bulgaria). Dutch and Danish sectors also had a late reopening (January 2022), preceded by Slovenian and Austrian GLAMs that had reopened in December 2021.

Country	Pre-pandemic period	Pandemic period	Post-pandemic period
Austria	1,631,427	215,436	816,483
Belgium	256,131	1,464,363	757,615
Bulgaria	23,671	104,332	16,019
Croatia	28,813	2,598	126,059
Cyprus	20,598	37,647	10
Czechia	24,565	117,071	926,311
Denmark	957,756	23,876	28,960
Estonia	191,128	2,518	589,635
Finland	81,385	521,339	521,376
France	2,451,694	78,878	1,509,459
Germany	1,131,979	3,964,562	1,011,860
Greece	134,907	224,919	284,552
Hungary	210,981	107,464	591,862
Ireland	69,794	23,347	20,851
Italy	546,494	700,467	509,890
Latvia	83,873	2,002	29,810
Lithuania	18,848	62,241	433,723
Luxembourg	65,592	-	-
Malta	81	-	1,122
Netherlands	6,897,276	1,053,063	1,108,107
Norway	2,999,884	26,840	442,917
Poland	1,312,272	1,448,000	949,661
Portugal	25,603	505	123,609
Romania	117,642	9,254	203,542
Serbia	27,726	47,184	6,659
Slovakia	8,679	6,403	2,390
Slovenia	55,360	358,996	52,781
Spain	1,384,453	655,431	2,689,624
Sweden	2,216,098	1,412,542	1,007,572
Switzerland	1,554	317	56,868
UK	1,786,805	45,544	2,932,166

Table 6 Digital records contributed to Europeana by GLAMs (per country), prior to, during and after the COVID-19 pandemic crisis.

Notes: All data were drawn on the Europeana data statistics dashboard as of 1st August 2023.

Pre-pandemic period: from November 2008 (launch of the platform) to February 2020.

Data available at: <https://metis-statistics.europeana.eu/en/data/country?date-from=2008-11-20&date-to=2020-02-29>.

Pandemic period: conventionally, from 1st March 2020 to 28th February 2022 (see also Table 5).

Post-pandemic period: from 1st March 2022 to 31 July 2023. Data available at <https://metis-statistics.europeana.eu/en/data/country?date-from=2022-03-01&date-to=2023-07-31>.

Light grey indicates countries with highly increased contributions during and after the pandemic period.

Dark grey indicates countries with highly increased contributions after the pandemic period.

Records by Country		√Count	√Percent
Total		25,028,631	100%
1	Netherlands	6,897,276	27.56%
2	Norway	2,999,884	11.99%
3	France	2,451,694	9.8%
4	Sweden	2,216,098	8.85%
5	United Kingdom	1,786,805	7.14%
6	Austria	1,631,427	6.52%
7	Spain	1,384,453	5.53%
8	Poland	1,312,272	5.24%
9	Germany	1,131,979	4.52%
10	Denmark	957,756	3.83%

Table 7 Digital records hosted at Europeana (by country), until February 2020 (source: Europeana).

These new data provide some additional insight of pandemic-driven shifts in the GLAM sectors across European states. As shown on Table 6x, in most countries we observe some positive shifts when comparing pre- and post-

pandemic volumes of contributed data. Yet, a couple of interesting additional observations can be drawn;

- a) Some national sectors continued to present an ‘accelerated’ digital activity in terms of considerably higher contributions of cultural data to Europeana. For instance, memory institutions in Finland, Greece and Italy still maintain their momentum whereas others have advanced their efforts even further; for instance, Lithuania and Czechia (the latter contributed almost a million records after March 2022). By contrast, sectors in Cyprus, Serbia and Slovenia seem to have not sustained their rising numbers of contributions.

- b) There were few countries that presented a ‘static’ picture during the pandemic, and which were mobilised shortly after their reopening, having already surpassed their pre-pandemic levels of contributions by many times (e.g., Croatia, Estonia, Malta).

Records by Country		Count	Percent
Total		56,962,654	100%
1	Netherlands	9,075,411	15.93%
2	Germany	6,242,007	10.96%
3	United Kingdom	4,764,638	8.36%
4	Spain	4,729,532	8.3%
5	Sweden	4,636,212	8.14%
6	France	4,041,841	7.1%
7	Poland	3,709,933	6.51%
8	Norway	3,469,641	6.09%
9	Austria	2,664,509	4.68%
10	Belgium	2,531,611	4.44%

*Table 8 Digital records hosted by Europeana (by country), as of today (August 2023)
(source: Europeana).*

Overall, the shifts observed through the Europeana platform provide some indication that national sectors that had done much work in providing online access to their digital materials before the outburst of the pandemic crisis (e.g. Netherlands, Norway, France), have maintained a steady pace to their digital output. Some sectors that were already ‘digitally mature’, such as Germany, Spain and the UK accelerated their efforts of making cultural materials available online (at least, through Europeana). Although the landscape did not change dramatically in terms of ‘major players’ (see tables 7-8), the pandemic mobilised increasing efforts in several countries, such as Czechia, Finland, Hungary, and others. Quite notably, the total number of cultural records hosted by Europeana portal increased almost 2.3 times since the pandemic, today reaching 57 million items (as of August 2023) from 25 million that were held in February 2020.

However, online access to cultural heritage and cultural data remains slow across a considerable number of national GLAM sectors that are challenged by limited resources and infrastructure. For instance, Serbia provides only 82,071 items which corresponds to merely 0.14% of all available European cultural data. Small island states such as Cyprus and Malta have small volumes of data (α. 50,000) despite their latest efforts. In comparison, the Netherlands provides access to 6.9 million items. Other Balkan states, such as North Macedonia, Albania, and Bosnia-Herzegovina, have practically no digital presence. This information suggests that in the post-pandemic era there are still huge gaps and variation across digitisation progress and access to cultural data across the GLAMs of Europe (which reminds us of the pattern of global digital divide).

3.3 Impacts of digital engagement on users/audiences

The pandemic had a significant effect on the wellbeing of individuals, communities, and society as a whole, including vast negative impacts on physical and mental health, work-life balance, social connections and social capital (OECD, 2021). The crisis and its related public health measures (e.g., quarantine and isolation, physical contact restrictions, disruption of schooling, cancellation of social gatherings and public events), contributed to general feelings of fear and pessimism, while pushing psychological distress, anxiety, and depression above the

normative levels (WHO, 2021). Digital access and engagement with the work of art and heritage during such hard times demonstrated the value of GLAMs' digital presence and their provision of online cultural services.

Interestingly, some preliminary survey findings of the UK audience provide evidence of the **positive effects that digital GLAM engagement had on 'boosting the mood' of virtual visitors during COVID-19 and 'reducing [their] stress and anxiety'** (The Audience Agency, 2021a; 2021b). According to the same survey, users were mostly driven to visiting museums online **for their intellectual stimulation** - i.e., to learn (67%), to discover something new (53%), to be intellectually stimulated (52%) - **and for entertainment** (45%), as compared to visiting for professional (13%) or academic (13%) reasons (The Audience Agency, 2021a). Similarly, a vast percentage of web galleries' visitors were highly motivated by **intellectual stimulation and inspiration** (The Audience Agency, 2021b).

A recent study by Luck and Sayer (2023) explored the issue further, focusing on the impact of digital museum practices (in Europe and the world) on users' wellbeing during COVID-19. Wellbeing is determined by physical, social, and psychological variables that shape one's perceptions of personal happiness, quality of life and life satisfaction³⁸. The study found that although digital participation did not affect physical wellbeing significantly, **engagement with GLAM resources had an immediate positive**

³⁸ See also Fujiwara et al. (2014). Quantifying and Valuing the Wellbeing Impacts of Culture and Sport. UK Department of Culture, Media & Sport. Available at: https://assets.publishing.service.gov.uk/media/5a7de7a0e5274a2e8ab4492f/Quantifying_and_valuing_the_wellbeing_impacts_of_sport_and_culture.pdf

effect on users' personal wellbeing while decreasing their negative emotions.

Digital visitors sampled were generally found 'to feel happier, more connected to, and interested in the world around them, increased life satisfaction, less nervous, afraid and guilty and more interested, enthusiastic, attentive, excited and inspired' (Luck & Sayer, 2023: 14).

Yet, for Morse et al. (2022: 1), 'the most successful digital engagement came from **those activities that promoted a sense of community or an invitation for self-expression** by visitors'; namely, digital engagement where participants become 'actant users' (Parry, 2019; see also page 39). Based on their international museum survey, Morse et al. (2022) observe that institutions that remained 'open online', 'allowed many people, especially children and educators, to find an escape, solace, or support during a difficult period (25). More importantly, initiatives that **opened up GLAM virtual spaces to outsiders and gave voice to those normally excluded** from cultural production/consumption had been successful in **making younger and less familiar audiences 'feeling welcome'**. Therefore, in the post-pandemic era, GLAMs' digital work needs to sustain and enhance **opportunities for self-expression that cultivate a sense of belonging to a community and make users feel 'a legitimate part of it'** (ibid: 23) as key for retaining these new (web) audiences (and possibly move them also on site),

3.4 Financial issues and digitisation costs

A vast number of GLAMs operating in Europe are funded primarily from the public sector, either centrally (e.g., Ministries of Culture) or from regional and local municipal bodies, combined with secondary streams such as private donations, sponsorships or own revenues from tickets and memberships. In turn, **digital work in the sector is financed through a mix of GLAMs' internal funding, public grants (European, national, local), private funding (e.g., by public-benefit foundations), potentially complemented by 'seed money' from crowdfunding and volunteer work** (Stroeker & Vogels, 2012: 25; Mowat et al., 2022: 37)³⁹.

Overall, we observe that in the early period of COVID, as reported by NEMO (2020b), most memory institutions operating in the European sector **ripped the benefits of their pre-pandemic investments in digital products**, and increased their online presence (e.g., in social media) **by temporarily allocating labour and financial resources to digital tasks**, since physical premises and on-site services did not operate during the crisis. Yet, the shifts observed in the volume of digitised records held at Europeana provide some indication that there has been some notable progress in financing heritage collections' digitisation in several national sectors across Europe during subsequent phases of the crisis. In addition, **the percentage of institutional budget allocated to digital work varies greatly between different types of institutions**. In the previous decade, evidence

³⁹ For a detailed analysis of GLAMs' financial channels, see Deliverable D1.2

suggested that archives operating in Europe devoted about 2.7% of their annual budgets to digitisation activities whereas national libraries merely 0.6% (Stroeker & Vogels, 2012: 22). In terms of actual money spent, the average yearly digitisation expenditures across the sector ranged between €20,000 and €40,000 (Stroeker & Vogels, 2012: 21).

Admittedly, the costs of digital activities, such as digitisation of collections, can be substantial, including among others, salaries, purchase of equipment, metadata creation, digital preservation, and rights clearance costs with limited channels to directly make up for the expenses, for instance, by collecting fees for photographic rights. In fact, **fee policies have been accused of being ineffective, owing to administrative costs and limitations to public access** (Sanderhoff, 2014: 71-72)⁴⁰. Regarding pandemic-driven shifts of open access culture in the sector, the results of the GLAMMONS survey (2023)⁴¹ indicate that there were no major alterations in the open access policy of most European GLAMs; 40% of participants reported ‘no change’ during the period 2020-22, whereas only 6% stated that the pandemic had led to the provision of ‘significantly more open access’ materials in their organisation⁴². Still, there is little evidence on the level of income generated by photo sales and fees for reproducing digital or digitalised imagery of artistic or intellectual work, and the degree to which this can be used to actually compensate or fund future digitisation costs.

⁴⁰ Furthermore, the ‘open GLAM’ movement advocates for open access to all online heritage resources and cultural records based on the digital/new commons principles (see Deliverable 1.7).

⁴¹ For more information about the GLAMMONS survey, see Deliverable 1.3, Section 2.3.2

⁴² A detailed mapping of sectoral practices regarding access can be found in Deliverable 1.7.

Moreover, digitalisation efforts need to be considered vis-à-vis the broader financial landscape where GLAMs operate. The closure of memory institutions due to the pandemic was an exceptional event that caused huge disruption to the economic planning of GLAMs while depriving them of some of their income streams (e.g., entrance fees and income from events and supporting visitors' services). Large-size GLAMs - which normally attract high volumes of visitors, have diversified portfolios of (secondary) services (e.g., retail, publications) and maintain close ties with tourism - suffered substantial losses of income (as high as 80% according to NEMO, 2020b). Some private museums, which relied primarily on sales revenues, were faced with bankruptcy and the dilemma of downsizing for their survival. Several peripheral small-scale public GLAMs suffered from decreased access to resources which in turn, limited their activities to the strictly necessary (for instance, according to the NEMO survey, rural museums ceased all their outreach activities). Regarding the GLAMs workforce, as one would expect, freelance professionals and precarious workers were the most affected by COVID-19 disruptions to the sector (ICOM, 2020).

How do you regularly develop your digital cultural products or digitisation activities?	(%)*
In-house enterprise	56.4
Outsource to specialised company	40.0
Exhibitions	35.5
Collaborate with other external digital communities	31.8
Archiving events	23.6
Outreach events	19.1
Creative reuse events	8.2
Hackathons	2.7
Crowdsourcing	0.9
Crowdfunding	0.9
Other	1.8

Notes:

* % of positive responses (multiple choice) by the sub-sample of institutions that reported engaging in digital work (n = 110). They represent 49% of the total survey sample (n=223).

Table 9 Channels used for digital production in the sector, based on GLAMMONS survey (2023).

Yet, admittedly, the GLAM sector in many European states was challenged by tight budgets and limited resources well before the pandemic crisis. Particularly small peripheral museums, galleries and libraries were already suffering from under-funding and understaffing. Thus, **financial challenges have been the norm for many GLAMs rather than an exceptional condition that emerged in the aftermath of COVID-19 outburst**. In this light, **new financial opportunities arising from sustained digital policies** need to be investigated further. For example, **digital fundraising** channels can be further developed and used to reach wider audiences as compared to traditional major donor campaigns that may not be suitable for smaller-scale organisations. Digital fundraising efforts could be targeted at large numbers of (diverse) supporters and visitors/users' communities (e.g.,

local, virtual etc.) ‘giving them **a sense of ownership and responsibility** for the art and culture that they value’ (Black, 2020).

Despite its potential, **crowd-support seems to remain a rather marginal practice for the sector** during and shortly after the pandemic crisis, especially across small and medium-size institutions, although **crowdfunding models ‘have experienced exponential growth over the last decade’ and are particularly popular across the creatives** (see Deliverable 1.2, page 33). Indicatively, survey evidence provided by Mowat et al. (2022: 26) suggests that **only a small minority of GLAMs employ hackathons (8%), crowdsourcing (7%) or crowdfunding (6%)** to engage with its communities (see also Section 4.2). A similar picture is drawn by our own GLAMMONS survey results (see Deliverable 1.3, Section 2.3.2), where the most prevalent modes of producing digital content are found to be ‘in-house enterprises’ and ‘outsourcing’ (Table 9). We thus hold that crowd-support digital solutions need to be explored further, as apart from the provision of valuable resources (e.g., monetary, labour) to the organisation, they also have the capacity to serve as communication and participation platforms.

4. The post-pandemic digital landscape

In the previous section, we discussed the digital behaviour of European memory institutions, establishing that the pandemic crisis had indeed induced some positive shifts, especially with regards to GLAMs’ digital presence and digitisation of collections. In this section, we further

investigate the legacy of the pandemic, interrogating whether the ‘digital momentum’ has a sustained effect on the sector during the post-pandemic period.

4.1 The ‘legacy’ of COVID-19

The post-pandemic period has found the GLAM sector ‘in a transition period regarding the digital era’ (Radermecker, 2022:10). Although today there is a plethora of memory institutions that acknowledge the importance of providing digital content and services to audiences, there still seems to exist a digital divide and heterogeneity regarding digital strategies and optimisation across the sector.

Starting from collections digitisation, we have seen in the previous sections that important steps had been made during the first two decades of the 2000s, allowing GLAMs that have already digitised some of their resources to maintain an active presence during the pandemic crisis. Moreover, the pandemic itself has motivated digital efforts to intensify, increasing the volumes of digital cultural data as compared to data available prior to the crisis (see Section 3.2). Similar observations have been drawn by other researchers, such as Tartari et al. (2022:11), suggesting that **the pandemic accelerated collections’ digitisation across European GLAMs, as a means to cope with the crisis.**

Overall, we observed that **in a context of strict containment measures and physical distancing, digital content served as a channel for GLAMs’ maintaining an active presence in cultural services production and provision.**

Online exhibitions in particular allowed for increased access for audiences that would not otherwise be able to attend physically (King et al., 2021). As Burke et al. (2020: 118) observe, at the time of the pandemic ‘visiting a museum from the safety of one’s own home while the physical collections were closed to the public’ seemed like a desirable activity. Thus, in the post-pandemic era by virtue of earlier developments in the sector together and the pandemic ‘wake-up call’, it became rather common for a memory institution to hold a digital collection and/or engage in digital activities. This is corroborated by the recent study by Mowat et al. (2022: 7) which reports that only a small minority of GLAMs operating in Europe (less than 30%) continues to abstain from digital activities.

Based on some testimonials, Noehrer et al. (2021) suggested that increased online engagement shifted traditional audience profiles beyond the classic visitor spectrum. However, **it remains unknown to what degree first-time virtual visitors also became first-time on-site visitors** after GLAMs reopened their doors to the public. In addition, regarding the relationship between users and GLAMs’ digital platforms, the empirical study of Tartari et al. (2022:11) reports that during the pandemic, Instagram and Facebook accounts of European **GLAMs increased their total number of followers; nonetheless, their interaction rate decreased.** This suggests that it is not sufficient for GLAMs to have a social media presence but in order to build their relationship to user communities **they need to have a solid online strategy of content production and distribution as well as engagement and participation.** For Tartari et al. (2022), cultural heritage institutions are

perfectly embedded in ‘attention economy’ dynamics that typically prevail in digital media, whereby diversity is often traded off with more mainstream content that can attract a higher number of views or ‘clicks’ (Tartari et al., 2022).

As reported by a recent survey by Mowat et al. (2022: 27), only 20% of European GLAMs reported having some distinct online/virtual audiences. It is perhaps striking that there is still a vast percentage of memory institutions that view digital audiences as identical to traditional audiences. New digital tools open up new opportunities for interaction that go well beyond views and click-and-share engagement, enabling novel ways of engaging with heritage and active forms of participation, creation and feedback, whereby virtual visitors would no longer be simply viewers (Rahaman, 2018). These new avenues need to be explored further and harnessed in order to widen GLAMs’ appeal to the public and attract non-ordinary audience groups (e.g., distant communities or the youth). However, for much of the sector, GLAMs **digital efforts remain imbued with notions of ‘traditional’ curatorial practices, simply reproducing the established methods of interpretation and curation in a virtual environment** (Noehrer et al., 2021). For many digital exhibitions, interactivity remains restricted to clicking, scrolling, and watching videos (King et al., 2021).

There are, of course, exceptions of museums (mostly large-size, national-scale) which have made important steps to **harnessing new prospects of digital tools to engage the public in their digital collections**, for instance, by

encouraging their engagement in enhanced investigations of art by combining high-resolution images with video and audio, 2D and 3D visual effects. Even on social media, some prominent GLAM organisations that have championed digitisation, such as the National Museum of Netherlands (Rijksmuseum), are now creating content that allows interested users to get a better sense of artistic details or see hidden layers of artwork (e.g. underlayers of a painting revealed through new imaging/scanning techniques; see figure 8). The digital work of memory institutions such as Rijksmuseum, is exemplary but admittedly not the ‘canon’ for sectoral practice. In the post-pandemic era, **further institutional support, resources and knowledge is still required so that best practices for engaging with digital audiences can become standardised in the sector and across smaller organisations that hold digital collections.** In this way, ‘going digital’ would not be confined to replicating the typical museum-audience relationship but will be seized as an opportunity for envisioning and working towards a radically different relationship with user communities.

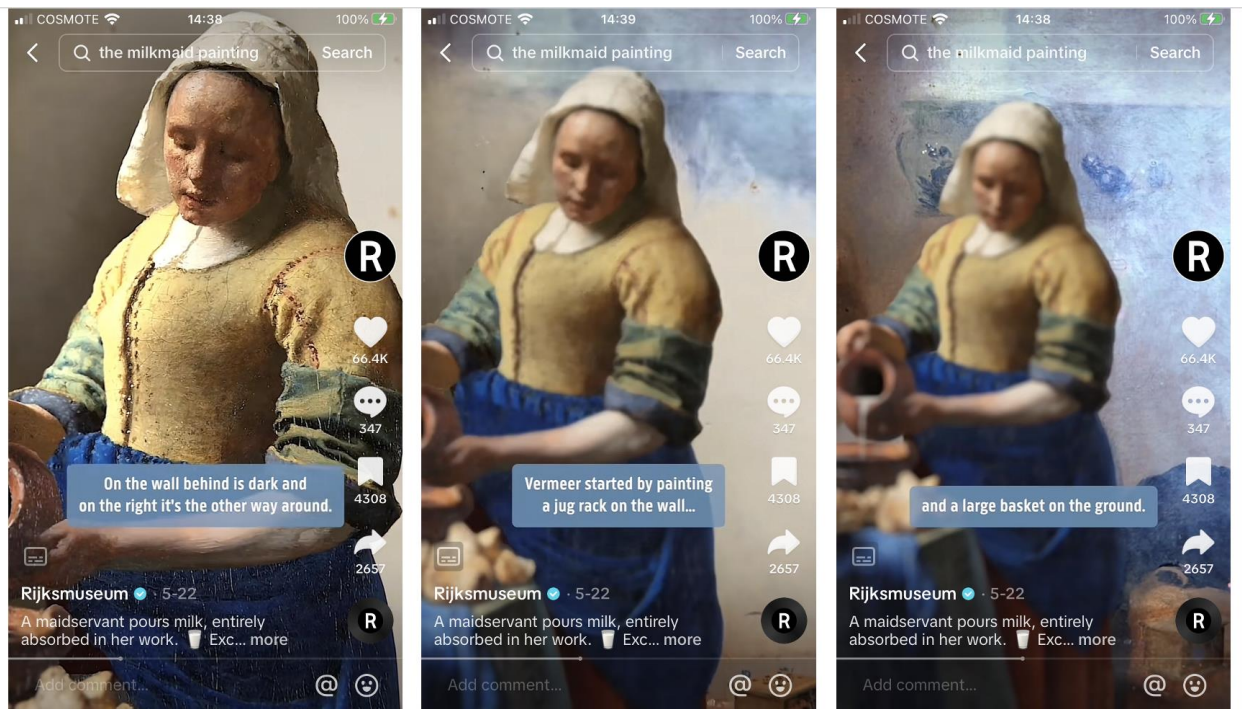


Figure 8 Stills from a Tik Tok video by the National Museum of Netherlands (Rijksmuseum) about Vermeer's famous painting of the Milkmaid (c. 1660). The video shows high-resolution details of the painting as well as a hidden blue layer that was overpainted by the artist. (source: @rijksmuseum, posted online on 22 May 2023).

Such vision presupposes the existence of a solid strategy for doing digital work at organisation level and a clear, holistic, audience engagement strategy. An early post-pandemic survey by Mowat et al. (2022:7) has found that today **only 2 out of 10 GLAMs operating in Europe have a comprehensive digital strategy** regarding digitisation and cataloguing of collections, licensing and copyright, or general operations/management. This exposes some structural problems to realising digitalisation potential.

Moreover, the digital transition poses questions with regards to the handling of users' data and digital audience management, as data mining and analysis of audience profiles remains a marginal practice in the sector, especially in smaller organisations that do not employ or consult

with data specialists (Radermecker, 2022). There still seems to be limited knowledge of how GLAMs can use digital analytics, tracking tools and metrics for evaluating performance or adjusting content based on users' behaviour or visitation traffic to become more relevant or competitive in an attention economy (Noehrer et al., 2021).

Regarding material resources devoted to digital work in memory institutions in Europe, the recent survey of Mowat et al. (2022:6) suggests that finance-wise, **digital collections absorb only a minor percentage of annual budgets (in most of the cases, less than 2%)**, whereas labour-wise, they engage 8% of total staff employed in the surveyed organisations. Most popular areas of staff digital expertise are social media/marketing, communication, digitisation, photography, and metadata cataloguing, whereas other specialisations include information science, digital curation and digital preservation. According to the same study, only a small number of GLAMs appear to have a strategy for staff training and capacity building for digital skills.

4.2 Digitally-enabled participation

Tartari et al (2022:11) observe that **collections' digitisation during COVID-19 remained disconnected from an overarching participatory strategy**. Even if the web 2.0 digital space creates space for interaction and active participation, **users of GLAM digital platforms behave more like a traditional, passive audience than co-creators or 'actants', using the digital space of GLAMs as a base for expressing their own creativity and engaging in**

community-making (Parry, 2019). Although today there are plenty of tools and platforms allowing for involvement and co-creation processes in GLAMs, it would be wrong to assume that these indeed translate into actual participation (Tartari et al., 2022).

Type of participatory activity	Organisations engaging (% of survey respondents)
Digital collections user-generated content	22%
Citizen science	20%
Wikimedia projects	12%
Hackathons	8%
Crowdsourcing	7%
Crowdfunding	6%
Outreach events	1%
Archiving events	1%
Creative reuse events	<1%
Exhibitions	<1%

Table 10 Popularity of digitally-enabled participatory activities as reported by memory institutions participating in the survey of Mowat et al. (2022: 26).

According to the data provided by Mowat et al. (2022: 26), **there is still a considerable number of European GLAMs that remain disconnected from participatory activities (the study reports a percentage as high as 58%)**, whereas for those engaging in participation, the most common activities include (a) digital collections featuring user-generated content (22%), (b) citizen science (at an impressively high percentage of 20%) and (c) Wikimedia projects (table 9). Other digitally-enabled participatory tools

such as hackathons, crowdsourcing and crowdfunding appear to be much less popular if not absent from sectorial practice. Quite surprisingly, ‘outreach events’ also score very low in the survey (1%).

This implies that most digitally-enabled participation in GLAMs continues to take the form of **contributions and collaborations that are supervised by experts and staff working with the organisation** (Simon, 2010). Limiting participation and involvement to contributory and participatory projects (i.e., institutionally controlled processes) may express **the sector’s reluctance to moving a step further, towards more co-creative heritage and cultural projects, or could simply reflect the inherent difficulties of doing so, in terms of resources, skills and commitment on behalf of both professionals and audiences**. Furthermore, memory institutions also seem to lag behind in areas, such as artificial intelligence and multilingual access, that can enable participation and involvement of diverse audience groups (e.g., different ethnic backgrounds, people with disabilities etc.).

Harnessing digital technologies further to increase access, inclusivity and engagement of the disconnected with cultural resources needs to become a sustained policy for the sector, **not only as an enhancement to their traditional services but at the core of GLAMs delivery**, facilitating efforts to reach non-visitors and under-represented social groups, such as people with mobility disabilities and youth communities from marginalized backgrounds. Nowadays, when accessing and experiencing heritage through GLAMs, the focus no longer rests on the collections themselves, but

on the connections and relevance that users and audiences can find in these collections (Cassidy et al., 2018). While large-scale prominent cultural institutions lead the way of digitally-enabled participation, medium- and small-sized peripheral GLAMs need greater support and access to digital resources and appropriate tools, such as mobile, web and social media technologies, in order to effectively create meaningful and personalised experiences for their on-site and online visitors.

Furthermore, related research during the pandemic suggests that GLAMs **need to better understand their online visitors** (i.e., profile, needs and user behaviour) to provide ‘tailored’ opportunities for ‘actant users’ that allow **for self-expression and foster a sense of belonging to a community** (Morse et al., 2022). Therefore, as with conventional ‘offline’ participation, the task of developing and maintaining **a GLAMs-led digital participatory environment** needs to embark on **understanding their targeted communities (i.e., who they are, what do they share in common)** and their societal needs (Simon, 2016). This will allow GLAM professionals to design relevant and timely participatory projects (e.g., crowdsourcing, co-curation) that embrace and foster community-making by offering space for dialogue, debate, reflection, research and **a pluralist interpretation of cultural heritage and its value in the present.**

4.3 Funding and financial resilience

As we discussed earlier in this document, the pandemic just brought to the surface financing and management problems already present in the

sector. At the same time, the recent crisis demonstrated the value of GLAMs' digital work for audiences' engagement with cultural heritage, performed against a backdrop of 'persistent financing difficulties' (NEMO, 2020a: 2). Yet, despite the promising multiplier effects of digital engagement, in the current climate of controlled public spending and tight budgets for memory institutions, the massive costs of digitisation can be still considered unviable (Pelissier, 2021), even in the post-pandemic era. We shall not overlook the vast financial costs of massively digitising cultural heritage resources. In part, due to the financial costs of going digital, Google mass digitisation projects, such as Google Arts and Google Books, have gained a dominant - almost monopoly - position in the field.

A mix of funding, combining both public subsidies and some private sponsorships or commercial investment is often viewed as an alternative solution to state funding, although public/private partnerships often risk enclosing public domain works (Pelissier, 2021; see Section 2.2.2). It is possible for less ambitious small-scale projects to be implemented through crowdfunding in return for recognition and/or tax-deductible donations (ibid). However, as indicated by the recent survey of Mowat et al. (2022), apart from public subsidies, other potential external sources of finance most frequently include affiliate funding⁴³ or funding through EU schemes, whereas 'own' income streams, such as merchandising, licensing or **the (digitally-enabled) crowdfunding score very low** (only 4% of

⁴³ Affiliate funding describes the provision of services by individuals or businesses to GLAMs through a contractual agreement.

the sampled EU-based organisations reported using crowdfunding, Mowat et al., 2022: 6).

Digital or hybrid events and exhibitions, allowing for both on-site attendees and remote participants, can provide **cost efficient solutions** for organising institutions, offering a cheaper option for hosting larger crowds or showcasing objects in less physical space through VR technologies (Berbenkova & Karatza, 2022). The freemium business model, where basic and limited features are open to all users and advanced features are offered under a price premium (e.g. commercial exploitation rights) could be a solution to finance costly digital work. Furthermore, according to Valeonti et al. (2021), technological advancements open-up new channels for GLAMs' income generation through digitised images and collections in the form of crypto-collectibles and non-fungible tokens (NFTs) (i.e. online-only digital assets that can be sold for many thousands of euros). A case in point is the Uffizi Gallery in Italy and the Whitworth Gallery in the UK that recently joined the NFT market to compensate for their lost revenues during the pandemic. Valeonti et al., (2021) argue that other GLAMs are likely to follow their example, including world-prominent institutions such as the Hermitage Museum.

For the time being, the aforementioned represent some rare exemptions across the sector. Besides, most memory institutions that preserve, protect and engage audiences with cultural heritage are devoted to a public mission and are non-for-profit entities. Thus, in principle, **their digitalisation**

efforts are not targeted at making profits but mostly securing beforehand (e.g. through sponsors) or reimbursing afterwards (e.g. through user fees) their investment. Moreover, transforming digital images of cultural heritage into tradable goods, although promising in financial terms for economically-struggling GLAMs, raises some serious ethical and political considerations regarding access and use. Monetising digital content creates tension between GLAMs with a revenue-driven business model and public institutions that shall share art and heritage with a wide spectrum of beneficiaries. Wide accessibility and openness, which is in line with the professional ethics and values of the sector, can be fully undermined by access restrictions.

Still, digitising collections is only one aspect of the digitalisation process in the GLAM sector. A sustainable digital policy for enabling further digital transition (especially for small/medium-sized and peripheral GLAMs) calls for additional investment in digital skills and capacity building, research on audience behaviour and **innovative digitally-enabled solutions for mobilising participation of heritage communities.** Due to their potential to foster a great sense of **community and personal connection/ownership with cultural organisations** (Black 2020), **digital fundraising and crowd-support small-level giving**, although today secondary and supplementary financing channels, should perhaps be reconsidered as part of GLAMs funding mix and audience engagement strategy.

5. Concluding remarks

5.1 Opportunities and challenges for GLAMs' digital future.

The outbreak of the pandemic hit the GLAM sector hard. Lockdown restrictions and measures for social distancing, led to the closing of archives, libraries and exhibition halls of museums and galleries in Europe and the globe for an extended period of time. This has led to a sudden move online for a plethora of European cultural organisations operating across the sector. For prominent organisations, such as national museums, digital collections and cultural data became key for a proactive response and for securing creativity and engagement. At the same time, **for smaller peripheral organisations with limited capacity**, the COVID-19 pandemic crisis brought to the fore existing **weaknesses in coping with digital transformation**. Some preliminary evidence presented in this document indicates that in the post-pandemic period, digitisation efforts intensified (e.g. the volumes of cultural data increased as compared to the pre-pandemic period) but pandemic effects did not maintain their momentum in terms of organisation (e.g. allocation of budget and staff) and digital strategy.

Considering EU policy agenda for digitisation but also realities in the post-pandemic era, where related organisations need to operate in a stretched resource environment, a greater integration of digital content and tools in GLAMs' work can be particularly challenging. Reflecting on the results of their 'study on impact of digitisation and reuse of cultural heritage', Mowat

et al. (2022) acknowledge that it remains challenging for many organisations to secure the necessary resources and skills in order to commit to digital work. This is quite critical as ‘digital transformation is not only about technology but also skills and mindset’ (ibid: 38). European GLAMs require further institutional support and a viable operative model that can secure them with the resources to develop a vision for realising their digitalization potential, produce digital content that deviates from traditional curatorial practices and harness digitally-enabled participation and engagement with diverse audiences, without compromising access and their societal mission.

Almost a decade ago, Sanderhoff argued that the role of the GLAM sector in society was ‘to make our cultural heritage available to all, to support learning and education among the general public, to inspire creativity and personal development, and to help contribute to the building and preservation of a diverse culture’ (Sanderhoff, 2014: 31-32). New technologies and digital tools can contribute to meeting all these ends, opening up new opportunities for GLAMs work and professional practice. At the same time, digital media create challenges for GLAMs that need to adapt rapidly to an ever-shifting digital world in order to keep up with new developments, meet users’ and funders’ expectations and remain relevant while also continuing serving their ‘traditional’ tasks of preserving and protecting cultural heritage.

New digital tools open up new opportunities for interaction that go well beyond views and click-and-share engagement, enabling novel ways of engaging with heritage and active forms of participation, creation and feedback, whereby virtual visitors would no longer be simply viewers (Rahaman, 2018). **These new avenues need to be explored further and harnessed in order to widen GLAMs' appeal to the public and attract non-ordinary audience groups** (e.g. distant communities or youth). In this way, digital work will be aligned to **sectoral long-held goals of widening social relevance, access, and participation.**

For Pelissier, 'the digital ecosystem offers an unparalleled opportunity to make public domain works available to everyone, not only through shared access, but also with the possibility to be reused by third parties in the form of digital libraries' (Pelissier, 2021: 141). The opening up and reuse of digital resources can serve as a 'lever' for creativity and innovation, while also promoting the democratisation of culture and the visibility of diverse heritage (Pelissier, 2021: 145). Thus, a key question to ask is **whether the shockwaves caused by the coronavirus can be metabolised into a new digital strategy and organisational practice for public GLAMs.** Such organisational practice will allow digital production, dissemination and management to become enablers for progressing 'towards a more inclusive and democratic culture' across the sector (Radermecker, 2022: 12).

5.2 Implications for digital policy and practice

COVID-19 was a unique contextual and temporal situation; however, unfortunately in our times it feels like crisis is becoming the ‘new normal’. Early post-COVID evidence suggests that on many occasions, digital solutions served only as a substitute for the physical museum experience, ‘rather than as an opportunity to usher in a new digital paradigm for cultural mediation’ (Morse et al., 2022). Based on our review, we can draw the following implications for **building on digital investments made before, during and after the pandemic**:

- Digitalisation requires a solid management structure and skilled labour. Digital transformation in the GLAM sector requires long-term investment in building digital infrastructure and digitising collections while harnessing appropriate tools for presenting knowledge in a flexible and accessible way. Related policy needs to establish and foster channels for promoting training, continuing professional development in the sector and dissemination of good practices. Moreover, co-ordinated efforts and knowledge-sharing of digital experiences between cultural institutions can be helpful, especially for smaller GLAMs that find themselves at an experimental stage of going digital.
- The high administrative costs of charging fees for digital imagery and the principles of openness and democratisation of public access to cultural heritage advocate for an open, unrestricted access to

artworks and data that are not restricted by copyrights. Free downloading, sharing and creative adaptations of digital/digitised work can be encouraged and fostered by GLAMs.

- Digitally-led participation and crowd-support can be a 'hybrid strategy' for GLAMs that wish to reach out and embrace their audiences and communities. Digitally-enabled participation can be tailored to fit with the needs and expectations of what Parry (2019) defines as 'actant' users. In addition, 'although major donations are rare, the potential for unlocking small level giving, and engaging new audiences in the process, is one of the most obvious benefits of digital fundraising' (Black, 2020).
- Online exhibitions and digitally-enhanced interpretation may not be enough for making museums more accessible and inclusive. Although digitisation is not a quick-fix solution to GLAMs' democratisation, it can serve as a facilitator through a multi-level strategy, provided it is curated on its own progressive merits. Available digital audience data can inform and guide the design of strategic directions at sectoral level and the setting of strategic aims and tactics at organisation level. These include big data produced by 'multimedia devices designed for museumgoers (stationary or in movement), information points in the galleries, mobile apps for preparing a visit, immersive virtual reality experiences and follower interactions on social media, online cultural events, and so on' (Dimitrova & Chatzidamianos, 2022: 38). The analysis of this data can

reveal demographic/behavioural patterns and gain insight of audience trends across various sub-fields of interest, such as accessibility, affordability, representation and diversity (Manovich, 2017).

- Developing digital applications and tools also requires awareness of user needs. User communities can be involved in the development process to inform it. Europeana Network Association (2021: 2) defines a digital heritage community as ‘a group of people who work together on a voluntary basis to cultivate and share knowledge, expertise and best practices on a specific topic or area of common interest.’ As suggested by Tartari et al. (2022: 18), GLAMs could foster such digital communities and encourage them to participate actively in the decisional phases of digitalization work such as cataloguing and curating.
- EU directives need to persist on sharing of diverse digitised and digitally-born cultural data and material, providing for the small-scale (local, national, and international) GLAMs and relevant initiative and enhancing the collaboration potential of the large-scale ones.

REFERENCES

Berbenkova, M., & Karatza, A. (2022). 'Digital audience management and a supportive role for the EU.' In Radermecker A. S. (Ed.), *(Re)-Engaging Digital Audiences - Improving Audience Data*. Voices of Culture Brainstorming Report, pp. 24-36. Available at <https://voicesofculture.eu/2022/06/02/brainstorming-report-re-engaging-digital-audiences-challenges-and-opportunities/> (last access 10 July 2023).

Black, H. (2020). 'Digital fundraising for museums: How to unlock the potential of online giving'. *Museums Association*. Available at <https://www.museumsassociation.org/museums-journal/in-practice/2020/06/digital-fundraising-for-museums/>

Burke, V., Jørgensen, D., & Jørgensen, F. A. (2020). Museums at home: Digital initiatives in response to COVID-19. *Norsk museumstidsskrift*, 6(2), 117-123.

Cassidy, C. A., Fabola, A., Miller, A., Weil, K., Urbina, S., Antas, M., & Cummins, A. (2018). Digital pathways in community museums. *Museum International*, 70(1-2), 126-139.

Devine, C. & Tarr, M. (2019). 'The digital layer in the museum experience'. In Giannini T. & Bowens J. P. (Eds.) *Museums and Digital Culture: New Perspectives and Research*, Springer, pp. 295-307.

Dimitrova, M. & Chatzidamianos, M. (2022). 'Aspects of data collection and management with regard to reaching and rebuilding existing and new audiences via digital means (including a focus on the digitally deprived)'. In Radermecker A. S. (Ed.), *(Re)-Engaging Digital Audiences - Improving Audience Data*. Voices of Culture Brainstorming Report, pp. 24-51. Available at <https://voicesofculture.eu/2022/06/02/brainstorming-report-re-engaging-digital-audiences-challenges-and-opportunities/> (last access 10 July 2023).

Dragouni, M., & Lekakis, S. (2023). Co-creating the future of heritage in-the-making: empirical evidence from community deliberation at Naxos Island, Greece. *International Journal of Heritage Studies*, 29(4), 294-313.

European Commission (2006). https://ec.europa.eu/information_society/doc/library/leaflet_digicult1.pdf

European Commission, Directorate-General for the Information Society and Media, Lévy, M., Niggemann, E., De Decker, J. (2011). *The new renaissance: report of the Comité des Sages on bringing Europe's cultural heritage online*, Publications Office. <https://data.europa.eu/doi/10.2759/45571>

European Commission (2014). <https://cordis.europa.eu/programme/id/FP5>

European Commission (2018). *A New European Agenda for Culture - SWD(2018) 267 final*. Available at <https://culture.ec.europa.eu/document/a-new-european-agenda-for-culture-swd2018-267-final>

Europeana Network Association (2021). *ENA Community Terms of Reference 2021*. Available at https://pro.europeana.eu/files/Europeana_Professional/Europeana_Network/General/ENA-Community-Terms-of-Reference-2021.pdf (last access 10 July 2023).

Hylland, O. M. (2022). Digital cultural policy: The story of a slow and reluctant revolution. *International Journal of Cultural Policy*, 28(7), 813-828.

International Council of Museums (ICOM) (2020). *Museums, museum professionals and COVID-19*. Available at <https://icom.museum/wp-content/uploads/2020/05/Report-Museums-and-COVID-19.pdf> (last accessed 7 June 2023).

King, E., Smith, M. P., Wilson, P. F., & Williams, M. A. (2021). Digital Responses of UK Museum Exhibitions to the COVID-19 Crisis, March–June 2020. *Curator: The Museum Journal*, 64(3), 487-504.

Kolokytha, O. & Stroom, I. (2022). 'COVID-19 recovery, impact on cultural consumption by digital means and the EU's role in assisting cultural organisations.' In Radermecker A. S. (Ed.), *(Re)-Engaging Digital Audiences - Improving Audience Data*. Voices of Culture Brainstorming Report, pp. 14-23. Available at <https://voicesofculture.eu/2022/06/02/brainstorming-report-re-engaging-digital-audiences-challenges-and-opportunities/> (last access 10 July 2023).

Lemon, N. (2018). Collaborating and co-curating knowledge: Participatory engagement on Twitter between galleries, libraries, archives and

museums (GLAM) and education audiences. *Australasian Journal of Popular Culture*, 7(1), 93-106.

Luck, A., & Sayer, F. (2023). Digital Engagement and Wellbeing: The Impact of Museum Digital Resources on User Wellbeing During COVID-19. *Heritage & Society*, 1-22.

Manovich, L. (2017), *Instagram and Contemporary Image*. New York: CUNY.

Marty, P. F. (2011). My lost museum: User expectations and motivations for creating personal digital collections on museum websites. *Library & Information Science Research*, 33, 211-219.

Lekakis, S. (2020). A political economy of heritage and the commons: a first sketch focusing on Greece. *Cultural Heritage in the Realm of the Commons: Conversations on the*, 17.

Morse, C., Landau, B., Lallemand, C., Wieneke, L., & Koenig, V. (2022). From# MuseumAtHome to# AtHomeAtTheMuseum: Digital Museums and Dialogical Engagement Beyond the COVID-19 Pandemic. *ACM Journal on Computing and Cultural Heritage (JOCCH)*, 15(2), 1-29.

Mowat, F., Mc Neilly, N., Baker Hitzhusen, H. (2022). *Study on impact of digitisation and reuse of cultural heritage*. Europeana Foundation.

Museums + Heritage Advisor (20-11-2020). *Getting to know Smartify, partner of the Museums + Heritage Autumn Series*. Available: <https://advisor.museumsandheritage.com/news/getting-to-know-smartify-partner-of-the-museums-heritage-autumn-series/>

Network of European Museum Organisations (NEMO) (2020a). *Final report: Digitisation and IPR in European Museums*. Available at https://www.nemo.org/fileadmin/Dateien/public/Publications/NEMO_Final_Report_Digitisation_and_IPR_in_European_Museums_WG_07.2020.pdf

Network of European Museum Organisations (NEMO) (2020b). *Survey on the impact of the COVID-19 situation on museums in Europe*. Available at https://www.nemo.org/fileadmin/Dateien/public/NEMO_documents/NEMO_Corona_Survey_Results_6_4_20.pdf (last accessed 7 June 2023).

Noehrer, L., Gilmore, A., Jay, C., & Yehudi, Y. (2021). The impact of COVID-19 on digital data practices in museums and art galleries in the UK and the US. *Humanities and Social Sciences Communications*, 8(1).

OECD (2021). *COVID-19 and Well-being: Life in the Pandemic - Highlights*. Available at: <https://www.oecd.org/wise/COVID-19-and-Well-being-Highlights.pdf>

Parry, R. (2019). 'How museums made (and re-made) their digital user'. In Giannini T. & Bowens J. P. (Eds.) *Museums and Digital Culture: New Perspectives and Research*, Springer, pp. 275-293.

Pelissier, M. (2021). *Cultural commons in the digital ecosystem*. Wiley.

Quoc-Tan Tran (2022). *Setting the scene for participation: Socio-technical negotiations in museum work*. University of Hamburg (Unpublished PhD thesis). Available at: https://ediss.sub.uni-hamburg.de/bitstream/ediss/10306/1/Tan%20Tran_Dissertation.pdf

Radermecker, A. S. (2022), Introduction to *(Re)-Engaging Digital Audiences - Improving Audience Data*'. Voices of Culture Brainstorming Report, pp. 9-13. Available at <https://voicesofculture.eu/2022/06/02/brainstorming-report-re-engaging-digital-audiences-challenges-and-opportunities/> (last access 10 July 2023).

Saldanha, C., Smith, D. & Windle A. (2015). *Audience development via digital means*. Voices of Culture Brainstorming report. Available at https://www.voicesofculture.eu/wp-content/uploads/2018/07/1.Brainstorming_report_Audience_Development.pdf (last access 12 July 2023).

Sanderhoff, M. (2014). 'This belongs to you: On openness and sharing at Statens Museum for Kunst'. In Sanderhoff, M., (Ed.), *Sharing is caring: Openness and sharing in the cultural sector*, Statens Museum for Kunst, Copenhagen, pp. 20-131.

Shaw, A., & Krug, D. H. (2013), Heritage meets social media: Designing a virtual museum space for young people, *Journal of Museum Education*, 38 (2), 239-252.

Simon, N. (2010). *The Participatory Museum*. Museum 2.0.

Simon, N. (2016). *The Art of Relevance*. Available at <https://artofrelevance.org>

Stroeker, N., & Vogels, R. (2012). *ENUMERATE Survey Report on Digitisation in European Cultural Heritage Institutions 2012*. EUMERATE Thematic Network.

Tartari, M., Sacco, P. L., Manfredini, F., & Pilati, F. (2022). *D1.7 Guidelines for the best practices regarding the maximisation of the impact of digitisation of cultural heritage*. Horizon 2020 In-DICES: Measuring the impact of digital culture.

The Audience Agency (2021a). *Who are museum digital visitors?* Available at <https://www.theaudienceagency.org/asset/2440>.

The Audience Agency (2021b). *Who are galleries' digital visitors?* Available at <https://www.theaudienceagency.org/asset/2462>

Thylstrup, N. B. (2019). *The Politics of Mass Digitization*. MIT Press.

UNESCO (2020). *Museums around the world in the face of COVID-19*. Available at <https://unesdoc.unesco.org/ark:/48223/pf0000373530> (last accessed 7 June 2023).

Valeonti, F., Bikakis, A., Terras, M., Speed, C., Hudson-Smith, A., & Chalkias, K. (2021). Crypto collectibles, museum funding and OpenGLAM: challenges, opportunities and the potential of Non-Fungible Tokens (NFTs). *Applied Sciences*, 11(21), 9931.

Wallace, A., (2020). Words Mean Things (A Glossary). In *Critical Open GLAM: Towards [Appropriate] Open Access to Cultural Heritage*. OpenGLAM. Available at <https://openglam.pubpub.org/pub/the-glossary/release/1>

Waterton, E. (2010). The advent of digital technologies and the idea of community. *Museum Management & Curatorship*, 25(1), 5-11.

Watson, N. (1997). Why we argue about virtual community: A case study of the Phish.Net community. In S. G. Jones (Ed.) *Virtual culture: Identity and communication in cyberspace*, Sage, pp 102-32.

World Health Organisation (2021). *Action required to address the impacts of the COVID-19 pandemic on mental health and service delivery systems in the WHO European Region*. Available at

<https://iris.who.int/bitstream/handle/10665/342932/WHO-EURO-2021-2845-42603-59267-eng.pdf>

Wright, D. (2022). How culture became digital: editor's introduction. *International Journal of Cultural Policy*, 28(7), 777-785.