COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

Annual Report 2023/2024

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Please see the glossary on Europeana Pro for formal definitions of frequently used terms.

Consortium partners

The common European data space for cultural heritage is deployed by a consortium of 19 partners, coordinated by the Europeana Foundation.

Foreword

In the second year of the common European data space for cultural heritage, its potential to accelerate the digital transformation of the cultural heritage sector and foster reuse of cultural heritage data has become even clearer. As we reflect on the past year of deployment, we are pleased to grasp this potential to the benefit of our sector, those working within it, and those who reuse cultural heritage data.

At the foundation of our efforts is our innovative data space infrastructure. In the past year, we have implemented technologies, policies and practices to ensure that it is high-performing , interoperable, and sustainable, for example by making progress towards a persistent, reliable and unique identification system for the data space. In close collaboration with the Europeana Aggregators' Forum, we have made improvements to our data aggregation systems to make it easier for cultural heritage institutions to share their data with us. We supported the reuse of cultural heritage data by diverse audiences through optimising our APIs, updating related documentation and developing capacity building resources. And we have enhanced Europeana.eu to provide better browsing experiences and more efficient processes for multilingual translations.

This year we have also focused on the aggregation of 3D data, contributing to the goals of the European Commission Recommendation of 2021 on a common European data space for cultural heritage. We have reviewed our frameworks to ensure that they accommodate the complexity of 3D data, gathered data about 3D repositories in Europe, and increased support for different 3D formats on Europeana.eu.

This work was harmonised through, and reflected the achievements of, the [Twin it! 3D for Europe's culture campaign](#), which was a highlight of the second year of data space deployment. Run with the European Commission, Twin it! invited all EU Member States to submit at least one 3D digitised heritage asset to the data space. Following months of work from Member States, cultural heritage institutions, technological partners and colleagues across the Europeana ecosystem, we were delighted that every Member State in the EU made [remarkable contributions](#) to the campaign. We were proud to unveil the results in the Twin it! high-level event under the Belgium Presidency, which brought together 10 EU Ministers of Culture and other high-level dignitaries. We look forward to further cooperation and fruitful collaboration with our colleagues in Member States in the coming years.

The Twin it! campaign provided dedicated support, guidance and events to facilitate 3D digitisation workflows, building upon our extensive experience in building capacity across the cultural heritage sector. In this year of data space deployment, we have reached hundreds of professionals through our webinars, events, training programmes and of course through the vibrant network of the Europeana Network Association and its communities. Beyond 3D, events have built capacity in topics around copyright, impact, tech and more. A particular highlight was the return of our EuropeanaTech conference in October 2023, which saw over 700 professionals come together over three days of inspiring talks and workshops in the Hague and online.

While the conference put the focus on the technologies that enable the sharing of interoperable, high-quality cultural heritage data in the data space, alongside Artificial Intelligence and Virtual Reality, other inspiring initiatives encouraged the reuse of and engagement with the data itself. From
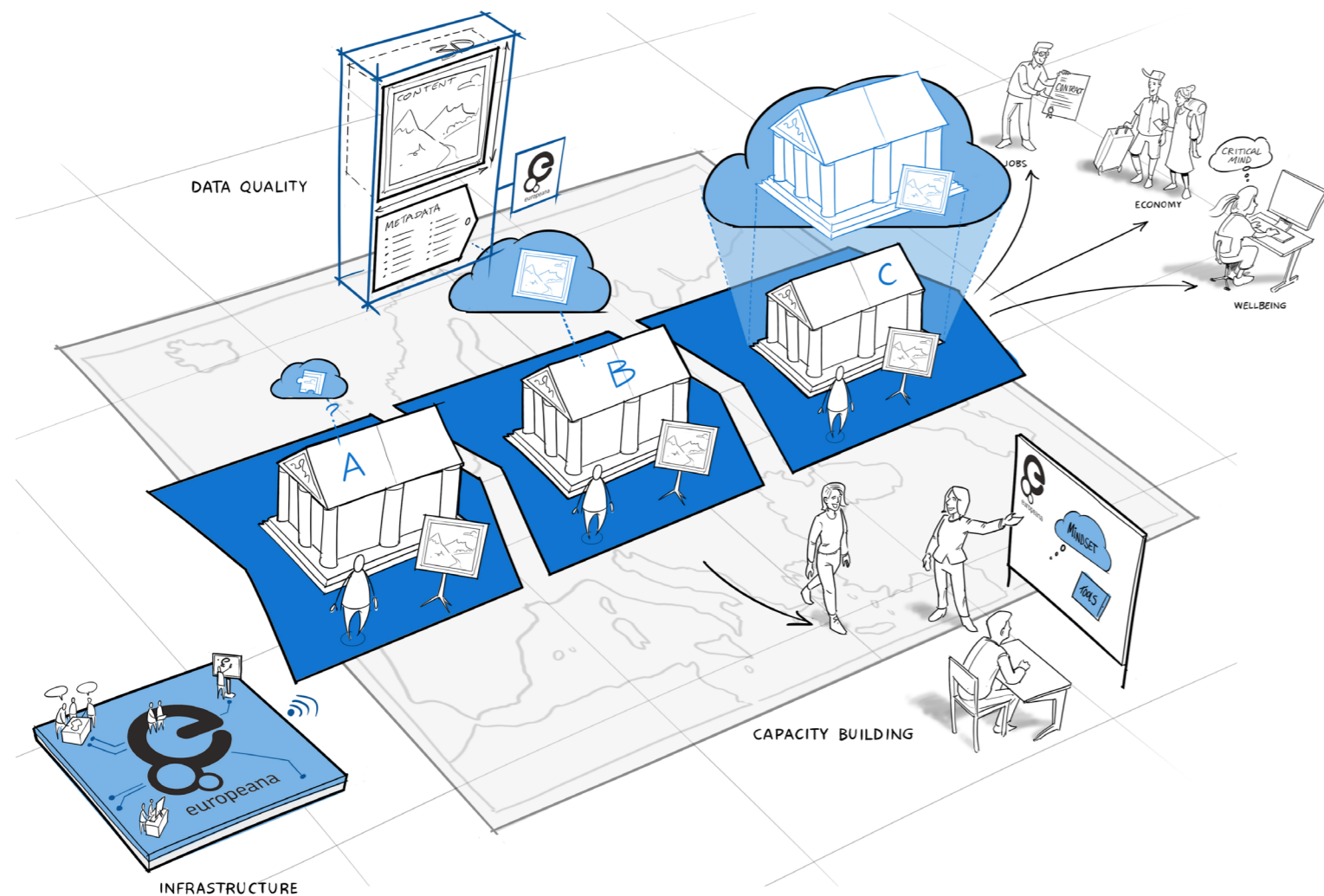
our flagship Digital Storytelling Festival and its Online Creative Residency, to the annual GIF IT UP campaign, to the digital spaces of Built with Bits and Low Code Fest, we have given audiences new ways to enjoy, get creative with and learn from the cultural heritage data made available through Europeana.eu. Capacity building events and resources and regular outreach work with research and education communities brought cultural heritage closer to those audiences - into classrooms and universities across Europe - and supported their digital practices with cultural heritage.

The achievements of the past year were made possible by strong collaboration across the Europeana Initiative, the data space consortium and the wider data space ecosystem. We continue to build connections through partnerships with other key initiatives in the European digital cultural heritage sphere, such as the European Collaborative Cloud for cultural heritage, and networks which support those new to the sector, such as the European Students Association for Cultural Heritage. Through these collaborations, we seek to shape and develop digital environments which are inclusive, collaborative and open, and ultimately, through all of our work, to champion Europe's green, digital and social transformation.

I hope that you enjoy discovering more about the achievements of the second year of data space deployment in this report, and that you can be inspired and informed by our work. We thank all of our staff, colleagues, partners and collaborators for your vital contributions.

Harry Verwayen, General Director of the Europeana Foundation

DIGITAL TRANSFORMATION

DATA QUALITY

C

B

A

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cocreated with
SKETCHY BUSINESS

INFRASTRUCTURE

CAPACITY BUILDING

JOBS

ECONOMY

CRITICAL MIND

WELLBEING

MINDSET

SKILLS

Digital transformation. Sketchy Business. 2023. CC-BY-SA

Introduction

The common European data space for cultural heritage is the flagship initiative of the European Commission to accelerate the digital transformation of Europe's cultural sector. The data space builds on the Europeana Digital Service Infrastructure (Europeana DSI) and the Europeana Strategy 2020-2025.

Work to deploy the data space is led by the Europeana Foundation (EF) in collaboration with a consortium of 18 partners from nine EU countries. The work of the consortium is supported by the Europeana Network Association (ENA), a strong and democratic community with about 5,000 experts working in the field of digital heritage, and the Europeana Aggregators' Forum (EAF), the network of national, domain and thematic aggregators who support cultural institutions providing data. Collaboratively, EF, ENA and EAF form the Europeana Initiative. The data space is overseen by the Member States in the framework of the Commission Expert Group on the common European data space for cultural heritage (CEDCHE).

1. Development and operation of the data space infrastructure
2. Integration of high-quality data
3. Capacity building and fostering reuse
4. Digital services for the public

This annual report describes work carried out under the data space from 1 Sep 2023 (M13) until 31 Aug 2024 (M24) based on the implementation plan (PM. Implementation plan M12). It also reports on budget and realisation as well as integrations of data space supporting projects.

QUALITY OF SERVICE

99.91%
Uptime of Europeana website

1.16s
Response time of Europeana website

99.97%
Uptime of Europeana APIs

0.15s
Response time of Europeana APIs

98.82%
Uptime of Europeana Pro

1.80s
Response time of Europeana Pro

AA
WCAG 2.1 accessibility level of
Europeana website

AA
WCAG 2.1 accessibility level of
Europeana Pro

*Average numbers for quality of service of Europeana products (Aug 2023 - Sep 2024). Europeana Foundation.
August 2024. CC-BY-SA*

Data space infrastructure

In the past year of deployment, the Europeana DS consortium provided a reliable data space infrastructure and quality of service and fostered innovation, interoperability and compliance with other data spaces.

Data space infrastructure and quality of services

The Europeana DS consortium extended and maintained the four main digital products of the data space (Europeana website, Europeana Pro website, APIs and aggregation systems) as well as the underlying infrastructure to host, monitor and recover systems. Europeana products were available 24/7 with a high uptime and a low response time.

Extend and maintain platform infrastructure and services. The consortium maintained the data space infrastructure and data space services and products and ensured quality of services.

In Y2, the consortium focused on ensuring the stability, persistence and access of resources shared with (or reused by) our audience by developing a policy and practices for Persistent Identifiers (PIDs). During this year, we have set the baseline for increasing the amount of PIDs (using a recognisable persistent identifier scheme) in the data space. Increasing the usage of PIDs in the data made available in the data space will continue to be the focus of our attention in the coming years.

We developed 'Tombstone records' that allow Europeana to keep records even after being deleted so that, potentially, no broken links will exist in the data space. We also focused on the stability of object

identifiers provided by data partners. In Y2 we investigated both practices of aggregators and CHIs towards PIDs. Via a dedicated survey we gathered data on the level of maturity of aggregators in the adoption and management of PIDs. The responses uncovered an interest in the topic, a desire to help CHIs with their PIDs, as well as a wide divergence between the practices of various aggregators - presenting an opportunity for the Europeana Initiative to issue more prescriptive guidance around the managements of PIDs to aggregators. We also investigated practices of CHIs using a quiz made from the data space PID policy which allowed CHIs to validate the policy requirements while also gathering data from them about their own practices. The results of the quiz indicate that the responding CHIs broadly agree with all of the seven principles and it showed positive results to the extent to which these principles are already implemented within the responding CHIs. In more than 75% of cases, four of the seven principles are either already fully implemented within the CHI, or are already partially implemented, or are planned to be implemented in future.

EF and AIT Vienna further developed the new post publication pipeline, developed as a prototype in Y1, to allow for more use cases and tested the services' adaptability and versatility (e.g. against the DE-BIAS project). EF also extended the logging infrastructure to retain more user behaviour (when using the Europeana website) related to search.

Substantial effort was put into infrastructure maintenance and technology upgrades to ensure high performance, resilience and maintainability. For example, we reviewed the inventory of data space infrastructure and products with specific attention to digital assets that could be deprecated (looking at green impact). Several physical servers, virtual machines and cloud servers were identified and validated for deprecation by the last quarters of 2024. We also measured the environmental impact of the data space which showed 41,800 kg CO2e carbon footprint of Europeana's digital services in 2023. Compared to 2022 (45,500 kg CO2e) we see a lower footprint over 2023 caused primarily by not having two cloud platforms anymore (which was the case for the larger part of 2022 because of migrating between platforms), and by the lower carbon intensities for generated electricity in Europe.

We updated and maintained technical documentation and performed disaster recovery and stress testing. To ensure continuous infrastructure reliability we investigated different scenarios for a failover environment. We concluded that a disaster recovery scenario covering a redeployment based on technical documentation and automated procedure was most appropriate, contributing directly to disaster recovery tests.

Finally, we ensured compliance of our operations with the European Union data protection regulation (according to Regulation (EU) 2018/1725) by maintaining and updating privacy statements and processes where relevant for our products and services as well as ensuring that the third party tools we rely on are compliant.

Extend and maintain aggregation systems and services. EF, PSNC and DATO progressed with the developments outlined in the Aggregation Strategy to make data aggregation easier and to assist providers in increasing the quality of their data.

The consortium maintained and further developed the Metis Suite, our aggregation system including Metis and the Metis Sandbox. Beside the usual technology upgrades and bug fixes to ensure continuous high performance, we improved the way language classifications are normalised in Metis and implemented a new usage tracking feature in the Sandbox.

This year, we focused on a new data processing framework for eCloud (the core Metis data storage) and the Metis Suite. We selected Apache Flink and used this framework to implement a new data processing library that has all the functional capabilities required to work in conjunction with the Metis Sandbox (as Proof of Concept/POC). In Y3, we will fully operationalise the new framework with the Sandbox which we expect to gain major benefits in the area of performance and robustness.

In Aug 2024, we measured the average time required for data publication (incl. full and incremental processing) which showed an average duration of 17.3h (for a dataset with 22,917 records). This means that on average, processing happens at a rate of about 2.71 seconds per record.

DATO maintained and improved [MINT](#) to support aggregators with semantic mappings (for example, adding a new image analysis module to supply annotations). In Y2, the Metis Sandbox API was fully integrated with MINT so aggregators can directly benefit from the Sandbox without leaving their working environment (the MINT tool in this case). The Sandbox API provides functionality to perform problem pattern and validation analysis, and a user can start a full processing workflow in the Sandbox. The API was integrated into three aggregator's infrastructures/MINT and testing indicates that users of MINT are benefiting from the shorter feedback loop.

PSNC worked on consolidating the IIIF image service and making it more robust. This work added backup and restore capability to the IIIF server, safeguarding it against data loss. Additionally, we worked on the robustness of the server so that it will be able to better handle a (sustained or incidental) high volume of requests.

Extend and maintain Application Programming Interfaces (APIs). EF and AIT-Vienna maintained and supported the Europeana APIs. New activities contributed to an improved and extended experience for API users and consequently to an improved user experience within the Europeana website, more specifically, towards a better and fully multilingual search and exploration experience (Search & Record APIs, Translation API), personalisation (Recommendations API) and participation (User Set API, Annotations API).

The Search & Record APIs were the oldest of the Europeana APIs, designed in 2013. We split the APIs and fully redesigned the Record API (third version) to a newer version that follows today's standards

[Mosolygó vendéglátós tanulók csoportképe](#) by Bauer Sándor, fényképész - 1968 - Fortepan, Hungary - CC BY-SA.

and best practices for API design, development and Linked Open Data. Building on-top of the MVP that was developed last year, we further improved the code, developed functionality, migrated the API into the new database structure and performed tests that allowed us to identify any bugs or data loss in the storage and serialisation of the data. It is expected that the new design will make usage for developers much simpler while, at the same time, optimising data delivery. Initial tests of the new Record API with Alpha testers from different audiences (researchers, developers, creative reusers) were positive.

After the release of the Translation API (Y1), as the next step we upgraded the APIs that already use translation to switch to use the Translation API instead of calling Google Translate directly. This gives us some flexibility in terms of choices besides optimising our use of translation services. We also further optimised the Translation API (e.g. by improving existing plugins and adding a new plugin for using eTranslation) which was extensively tested against requirements (incl. required individual user sessions per day and response time) in order to judge the possible replacement of Google Translate with this service.

Following previous work on improving the representation, consecutive normalisation and improved indexing for dates, a new syntax for using date fields was added to the current Search API (V2) so that API users can start to experiment and provide feedback. This functionality will be made available in the upcoming Search API V3 planned for Y3.

We investigated solutions to extend the Recommendation Service with personalised and content based recommendations. These investigations identified the need to hold more information which increased our requirements for both scalability and performance of the service. We also reviewed functional requirements and consolidated and redeveloped related APIs to boost performance and have started to investigate possible replacements for the vector database (Milvus). If a suitable replacement is found, we will update the service as part of the maintenance work for Y3.

We developed a new gateway for the data.europeana.eu namespace to offer better control and scalability over our linked data offer, and we have set-up Cloudflare for both API and IIIF gateways offering this way better protection against several types of attacks (e.g. DoS, Code injection) and more options to deal with peaks of demand.

Finally, throughout the year, we maintained all Europeana APIs to perform well. For example, Annotation and User Sets APIs were further improved to accommodate more needs and prepare them for their first stable release, which is planned to happen in Y3.

Innovation, interoperability and compliance with other data spaces

Investigate innovative scenarios for aggregation models. The Europeana DS consortium, together with the Europeana Initiative, explored innovative and alternative data aggregation models. A new working group on Innovative Operating models (Dec 2023) was created to ensure a more holistic approach towards this topic and ensure liaison with other activities such as data governance.

In Y2, to innovate data aggregation mechanisms we have implemented MVP solutions for two new data aggregation methods in cooperation with data partners: 1) regular EDM records through IIIF change discovery and 2) Linked Open Data through a SPARQL endpoint. We validated these methods with the aggregation of new data into the data space, and we plan to refine them further in Y3.

We also reviewed the aggregation operational model in light of the data governance model for the data space and the new technologies available to support the exchange of semantic data.

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We mapped current aggregator roles to data space roles according to the [DSSC blueprint 1.0](#). This mapping helps to define the responsibilities of the current aggregators in the data space and also allows us to start the identification of the tools and services facilitating data exchange and reuse in the data space. It creates an understanding of what is expected from data providers, data recipients and the four types of data intermediaries (connection-providing intermediary, personal data intermediary, marketplace, vocabulary provider).

In addition, to fulfil the ambition to increase the total amount of assets in the data space, we collected examples of, and developed scenarios for, new types of data currently available and not yet shared within the data space (for example, metadata without content, collections as data, datasets of enrichments). Identifying examples of types of data collected within the data space is laying the foundation for a definition of high-value datasets and provides the basis for defining new data products for the data space.

We hold discussions on centralised and decentralised aggregation in relation to the integration of new types of data and the definition of the role of aggregator in the data space. Developing scenarios for centralised and decentralised aggregation remains a difficult task as the amount of use cases is still limited. We defined key directions for data aggregation in the data space, including 1) the establishment of a strong network of aggregators and intermediaries, 2) the expansion of the data and tools offered in the data space, 3) the implementation of innovative aggregation technologies and 4) the development of new cooperation agreements.

Synergies with other European data spaces. The Europeana DS consortium collaborated closely with relevant initiatives to ensure interoperability with other European data spaces. EF collaborated with the [Data Space Support Center](#) (DSSC) and participated in meetings on data governance (thematic group), in particular to provide feedback to the blueprint and gain insights on current practices. EF also contributed to DSSC surveys related to data spaces' impact.

EF developed a first version of a mapping of the data space tools and services to the DSSC blueprint. Through this exercise we analysed the different main blocks of the blueprint and aligned our current tools and services to it. This allowed us to identify areas of the blueprint that are at the moment not clear enough, areas that are already well covered by the current activities of the Europeana Initiative (e.g. interoperability), areas where we do have gaps and last areas of work we do and are not mentioned at all in the blueprint (e.g capacity building).

We also collaborated with other data space initiatives. EF is part of the consortium that will deploy the data space for tourism, had discussions with the language data space about potential synergies, and closely followed the development of the European Open Science Cloud (EOSC) and data space for skills. Collaborations focused on sharing Europeana's almost 15 years of experience in managing and sharing data and in developing products and services around data.

Support interoperability and technological innovation for digital cultural heritage. EF and NISV supported the [EuropeanaTech Community](#) and its Working Groups (WGs) and Task Forces (TFs). The task force 'From shelf to Europeana' published a first version of a handbook on [digitisation workflows](#). The working group on [Datasheets for digital cultural heritage](#), supported by the Europeana Research Community and EuropeanaTech, published a template and presented their work at a large number of events, creating connections with similar initiatives The EuropeanaTech steering group remained active in furthering the community's activity in [heritage acoustics](#), [3D](#) and [Artificial Intelligence](#) (AI) with [news posts](#) ([for example](#)) and [webinars](#) on the topics.

The [IIIF & Europeana Working Group](#) facilitated the adoption of the IIIF standard in the data space, which mostly progressed on capacity building material (e.g. new course about [IIIF image conversion](#) and on [EDM to IIIF manifest creation](#)). EF continued its involvement in the IIIF community and contributed to the [IIIF Executive Committee](#), the [IIIF Technical Review Committee](#), and (co-chairing) the [IIIF A/V Motivations Technical Specification Group](#).

The Data Quality Committee (DQC) supported the consortium in addressing key data quality issues with a particular focus on reuse and discovery of cultural heritage objects (e.g. formatting of dates and data quality problem patterns).

We maintained the Europeana Data Model (EDM) to the level of coverage and quality that is needed to keep it positioned as a cornerstone for semantic interoperability within the data space and other data spaces. This included, for example, interoperability for 3D content, representing deleted EDM records ('Tombstone records') and automatic enrichments and annotations. Progress was documented, for example by updating the EDM mapping guidelines on the Europeana Knowledge Base when appropriate.

We also supported data interoperability by updating the mappings needed to ingest Linked Open (multilingual) data on contextual entities (like persons, places, concepts).

We presented the data space and its developments at relevant events to promote innovation and interoperability (e.g. EVENT: Defining Paradata, Metadata & Data) and published related papers (e.g. Datasheets for Digital Cultural Heritage Datasets in the Journal of Open Humanities Data) for wider dissemination.

Τραβώντας τα δίχτυα by Volanakis Konstantinos - Aikaterini Laskaridis Foundation, Greece - CC BY.

DATA QUALITY

CROWD SOURCING

AUTOMATION
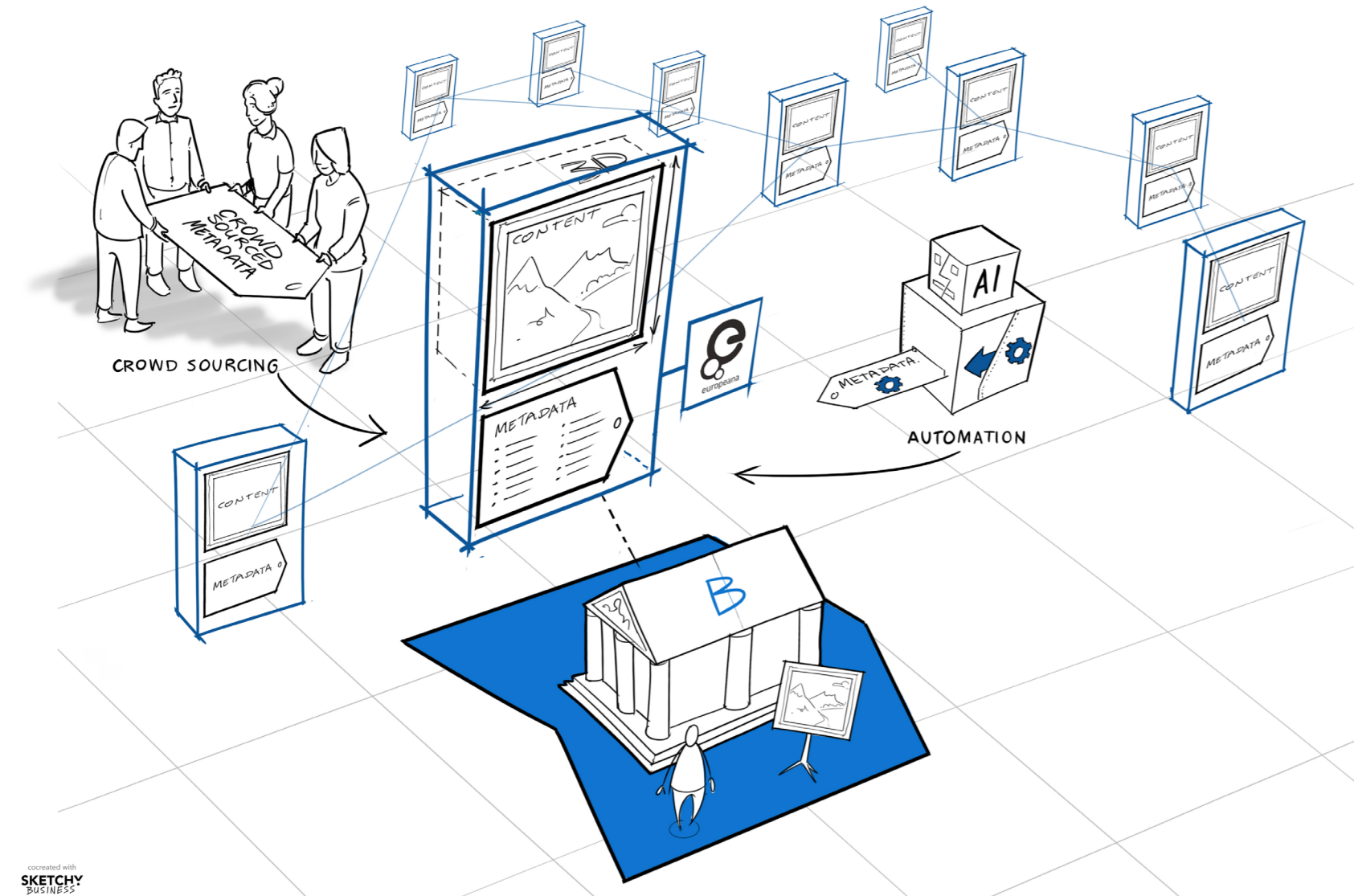
Data quality. Sketchy Business. 2023. CC-BY-SA

High-quality data

In line with the objectives of the European Commission's recommendation on a common European data space for cultural heritage (2021), the Europeana DS consortium increased high quality, usable and accessible data in the data space, with particular attention given to 3D. The consortium maintained data governance mechanisms to support the provision and management of data within the data space. Finally, we worked on automated approaches to address data quality issues at scale.

Data governance mechanisms

Data governance. Data in the data space is governed through various organisational tools, principles, processes and standards that are harmonised so that the data is interoperable, manageable, reliable and remains useful in the future. These are progressively evolving, particularly through the actions outlined in the Data governance strategy and plan in the data space, supported by the Europeana Data Governance Stakeholder Group (such as analysing the conditions that govern metadata and evaluating copyright in 3D).

In Y2, we reviewed our current approach to the governance of metadata and recommended conditions for the reuse of metadata in the data space going forward. On that basis, we introduced the possibility to distinguish between the current Europeana service infrastructure (layer 1), and an 'extended' data space (layer 2). In layer 1, the reuse of metadata could either remain subject to CC0, or changes could be made to enable licences or tools other than CC0 to be applied to descriptions. In layer 2, a minimum set of conditions that metadata should meet were identified, but more concrete information on the architecture and 'content' of the data space is needed before these are further refined.

The data governance working group, with the input of the 3D working group, identified various questions that needed clearer answers in the area of copyright and 3D. A report by Dr. Andrea Wallace answers those questions and concludes that rights statements have been largely inaccurately used on 3D material. The report provides a logic to enable the identification of whether copyright arises on a 3D model, and to support the choice of the correct rights statement. The report provides a baseline for the Europeana Initiative to develop guidance in this area in view of an increase of 3D models being made available in the data space.

We also analysed requirements for the provisioning of persistent identifiers (PIDs) resulting in the first version of the policy for PIDs in the data space. This policy presents, in the form of principles, clear expectations for data partners seeking to implement and contribute (P)ID to the data space so as to guarantee stable and long lasting dissemination and reuse of the cultural heritage objects being shared in the data space.

Finally, we outlined the types and characteristics of contracts and similar measures that support the functioning of the data space in future agreements, such as the reduction of administrative steps in data transactions, the scalability and flexibility of data transaction conditions, and the harmonisation of requirements in 'partner' platforms to ensure their integration with the data space.

Frameworks and standards. With 3D content being a high priority for the data space, we reviewed our frameworks, in particular the Europeana Data Model (EDM). We made a proposal to refine and extend EDM to support richer metadata for 3D objects. Once implemented this will bring opportunities for enhanced quality and potential for increased re-use of 3D objects. The process of reviewing and extending EDM for 3D has relied on a survey which identified the metadata elements used to describe 3D objects used in relevant projects and platforms from the cultural heritage sector and served as inspiration for adding new elements in EDM in a way that is interoperable with existing schemas.

In addition, the definition of the Enrichment Policy for the data space, along with the needs of enrichment efforts in the data space, require the previously developed EDM provenance profile to accommodate additional requirements. An initial proposal for the revised EDM provenance profile was prepared covering a wider range of information for producing and validating the quality of enrichments. EF developed an action plan to translate the overarching principles outlined in the Enrichments policy for the data space (developed in Y1) into concrete tasks that will support the creation of vision-led, consistent and harmonised enrichment efforts in the data space. For example, throughout Y2, we implemented a separate metadata tier calculation for data enriched by EF.

The Europeana Publishing Framework (EPF), with its key components and implementation services and products, is under constant development (e.g. related to the new metadata tier for data enriched by EF).

The Europeana Licensing Framework (ELF) continues to be operational and supports current data sharing activities. EF maintained the RightsStatements.org website and resources, in particular by maintaining the technical infrastructure and identifying a sustainable solution for the hosting of the statements. We engaged the Rights Statements consortium in the consideration of future organisational priorities for the consortium.

EF continued to support the Europeana Copyright Community in the organisation of regular copyright and policy office hours. The group also created an overview of frequently asked questions on openness, and submitted feedback to the Copyright Unit, DG CNECT, on key copyright challenges faced by the cultural heritage sector. Its out of commerce works working group continues to facilitate regular calls for knowledge exchange on this topic and continues to enrich the overview of transposition and licence provisions. The Article 14 task force conducted various consultation sessions to support the review and update of the Europeana Public Domain Charter, and published an overview of national public domain legal provisions.

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The main focus for updating guidelines to reflect changes in EDM, EPF and ELF was the work on the 3D documentation, which was updated to accompany the efforts of Member States to prepare 3D models as part of the Twin it! Campaign (e.g. publishing guide for 3D content). In addition we keep the EDM mapping guidelines and the Publishing Guide up to date.

Following efforts to refine the list of problem patterns in Y1, the Data Quality Committee (DQC) began to quantitatively assess a selection of patterns, beginning with all these implemented as part of the reporting in the Metis Sandbox. The goal is to measure their impact in the entire Europeana metadata set (as opposed to newly ingested datasets), and possibly adjust their definition to ensure they are useful for aggregators and their partners in their work on data quality.

The Data Quality Committee also gave feedback on other activities' work, for example on date normalisation, and published guidelines in the Europeana Knowledge Base which explain to data partners how date metadata is normalised upon ingestion in Metis and what they can do in order to facilitate this process. The DQC also supported language detection and prepared recommendations to providers about temporal metadata.

Data acquisition and data improvements

EF maintained and further developed processes and practices to support efficient data acquisitions and data improvements, while working towards a sustained increase of high-quality data in the data space.

Workflows and practices for data publication. EF provided mechanisms to communicate and report on data issues which enable aggregators and CHIs to recognise and act on the issues. Both

applications, the Metis Sandbox and Data Statistics Dashboard, were actively used by aggregators and have proven to be a great help in preparing data, allowing for faster publication.
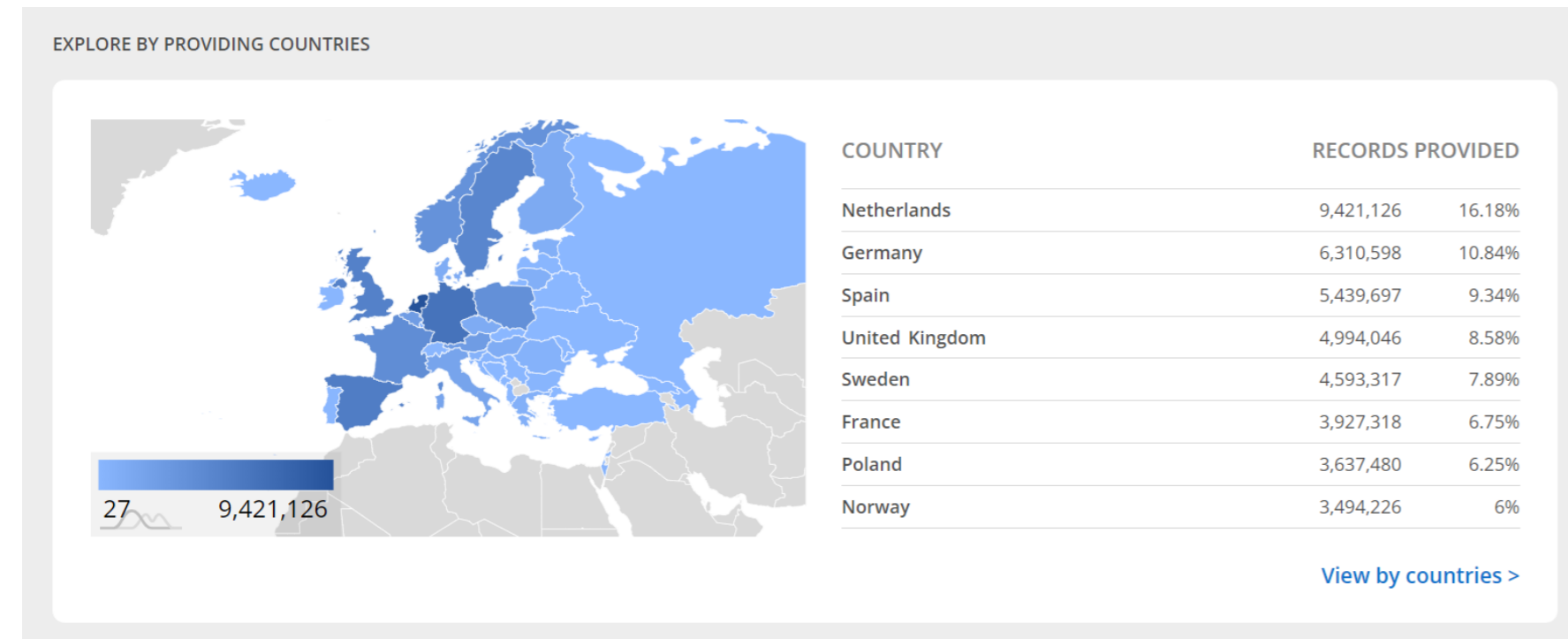
We maintained and improved the Data Statistics Dashboard. Usage statistics are now available in the dashboard to gain better understanding on user behaviour and, with that, how best to improve offered functionality.

We implemented a mechanism both in Metis and in the Metis Sandbox to calculate a separate metadata tier for data added by EF as part of its workflow(s). This will allow evaluating and asserting the quality of enrichments added during aggregation.

Over previous years, we have developed a reporting mechanism in the Metix Sandbox to flag when metadata shows problem patterns that have been identified by the Data Quality Committee (DQC). In Y2, we created an inventory for the entire database to see metadata records impacted by the selected patterns. This will help us to improve reporting and maximise the chance for providers to act on the issues observed. The inventory of problem patterns is currently discussed in the DQC and as a result of these discussions, it is likely that Y3 will see new problem patterns implemented (and existing ones revised).
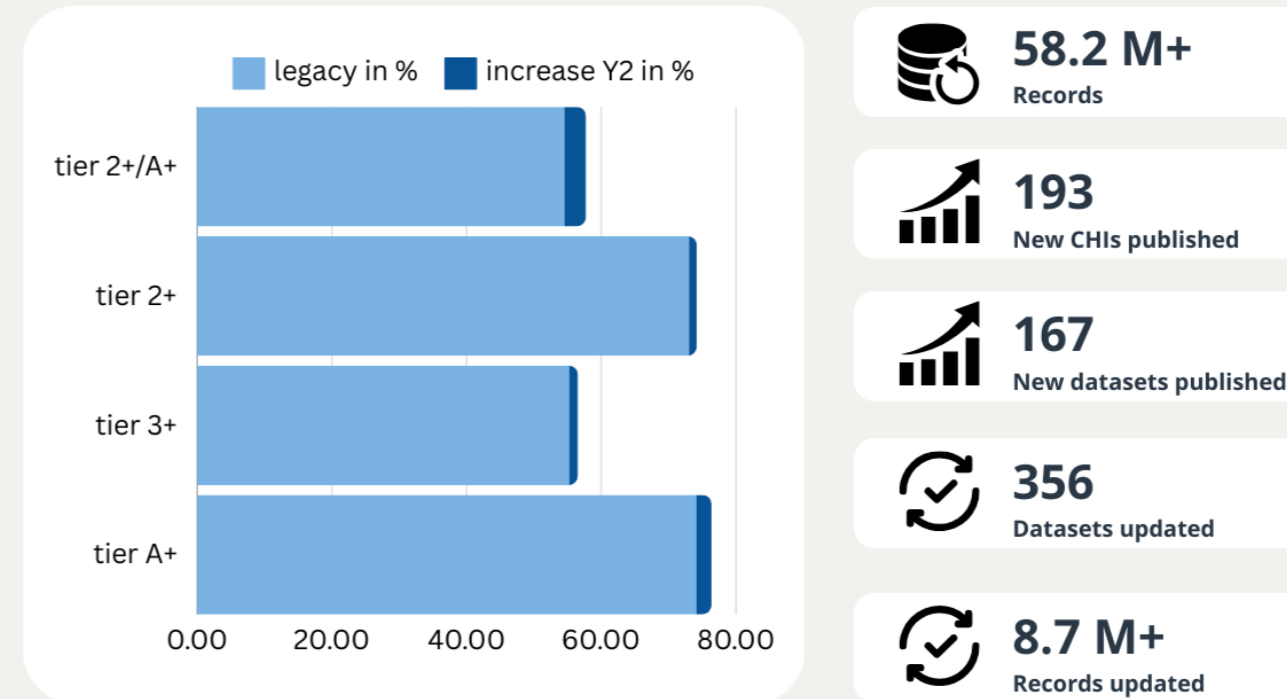
With the establishment of the data supply and data demand management cycle we are looking at data supply in a more holistic way to create a virtuous cycle for everyone involved. Efficient acquisition of high quality data, an optimised relationship management and the effective demand generation play together to power data supply and reuse of data. Since we focussed a lot on data acquisition in the past (e.g. development of Metis Sandbox), the investment in relationship management (e.g. accreditation scheme, CHI engagement workflows) will play a crucial role in Y3 to support the full implementation of the data supply and data demand management cycle.

Data quality. We raised the quality of data available on the Europeana website by progressing with data cleaning and improvements and by ingesting new high-quality data. The Europeana repository currently offers access to over 58.2 million items (excluding items that are not compliant with the EPF, Tier 0). 985,364 items more than in Aug 2023 (1.7% increase). The graph on the next page shows the division of data in the Europeana repository by top represented countries.

EXPLORE BY PROVIDING COUNTRIES

COUNTRY	RECORDS PROVIDED	
Netherlands	9,421,126	16.18%
Germany	6,310,598	10.84%
Spain	5,439,697	9.34%
United Kingdom	4,994,046	8.58%
Sweden	4,593,317	7.89%
France	3,927,318	6.75%
Poland	3,637,480	6.25%
Norway	3,494,226	6%

27   9,421,126

View by countries >

Countries with the highest contributions in the Europeana repository. Europeana Foundation. August 2024. CC-BY-SA.
More details on country-related data can be explored in the Data Statistics Dashboard.

DATA QUALITY IMPROVEMENTS

legend: legacy in %   increase Y2 in %

tier 2+/A+
tier 2+
tier 3+
tier A+

0.00   20.00   40.00   60.00   80.00

58.2 M+
Records

193
New CHIs published

167
New datasets published

356
Datasets updated

8.7 M+
Records updated

Data quality acquisition and improvements (Aug 2023 - Sep 2024). Europeana Foundation. August 2024. CC-BY-SA

During Y2, data quality updates (including contributions from data space supporting projects) affected almost 8.7 million records and 356 datasets (including newly created and updated data). The updates and ingestion of new records as well as the depublication of low-quality records led to an improvement of data quality available on the Europeana website, including 2.2 million records increase in Tier 2+/Tier A+ data (57.8% out of total in Aug 2024), a 1.18% increase for Tier 2+ (74.21% out of total), a 1.28% increase for Tier 3+ (56.55% out of total), and a 2.24% increase for Tier A+ (76.39% out of total).

We worked on reducing broken links in the data repository, noting that the number of broken links can vary a lot since datasets with broken links can occur at any time. For example, in Jun 2024 we recorded 1.96% of records with broken links. In Y2, we reduced non-EPF compliant content (Tier 0) to 6.77% (1.5% decrease).

The consortium re-engaged with inactive data partners in order to make new and updated data available to the data space or depublish data when collaborations could not be revived. In autumn 2020, we identified about 18 million records as coming from data partners that were no longer active. In the past year, work continued to reduce this number with a further 1.2 million records, taking the total of dormant records down to 7.6 million records in Aug 2024.

The data quality increase was also supported by bringing in new data. In Y2, we published collections from 193 new CHIs on the Europeana website and 167 new datasets. For the engagement with partners we started to use the 'Share your collections' page on the Europeana website (previously known as the Welcome Pack) which attracted 55 institutions in Y2 that are potential new data providers. In addition, 65 CHIs, that already provide data, have received their usage dashboard after they have signed up via the call to action in the welcome pack (e.g. Natural History Museum Berlin).

We have seen that the 'Share your collections' page on the Europeana website is working well, receiving a lot of registrations from various people. We updated the text and form to say 'Share your collections' (previously 'Share your data') making it explicit that we expect people to register who work for European CHIs and have digitised collections they already shared with us or want to share with us. We ask people submitting details as individuals to register for the Europeana Network Association.

CultLab3D: Automated Scanning Technology for 3D Digitisation by Project Leader: M.Sc. Inform. Pedro Santos, Head of Competence Center for Cultural Heritage Digitization at Fraunhofer Institute for Computer Graphics Research IGD - European Heritage Awards Archive, Austria - Public Domain.

Data partner support. Ongoing support to data partners included feedback about their data, with concrete advice on how to improve data quality and solve data modelling problems (with support of the Metis Sandbox and the Data Statistics Dashboard). Data partners can analyse their data in a more granular way using the dashboard, and can test mappings and quality improvements using the Metis Sandbox.

DS AGG partners supported CHIs with one-to-one support and helpdesk activities. In Y2 of the data space, DS AGG supported 126 CHIs from 29 countries. For example, aggregators helped their partners to fix (broken) links, to work with IIIF and to improve or update mappings including adding vocabulary terms to enrich metadata. Beyond the technical and data-related support, aggregators also supported their partners in finding sustainable aggregation routes (for example, supporting CHIs involved in projects that have ended and now require a new way to share collections with Europeana). DS AGG also started to collaborate with 41 new CHIs.

In Y2, EF explored opportunities to re-engage with national libraries. EF co-organised the workshop 'Collections as Data: Collaborating across Data Spaces for Cultural Heritage and Open Science' (Feb 2024) discussing new aggregation models for national libraries with representatives from several national libraries. In Y3 we will build on these discussions and develop a use case for national libraries and the 'Collections as Data' offer.

We also contributed to national workshops to inform the development or improvement of scalable and reusable training resources, starting with a national conference in Madrid organised by the Spanish Ministry of Culture. The conference (March 2024) was addressed to all data partners of the Spanish national aggregator (Hispana) (>100 participants). Data partners were presented with the complete process from data ingestion to audience engagement, helping participants to get a better

understanding of how aggregation works and the key players involved. It was a great learning experience for EF to see how aggregation works in Spain and made a huge contribution to improved relationships.
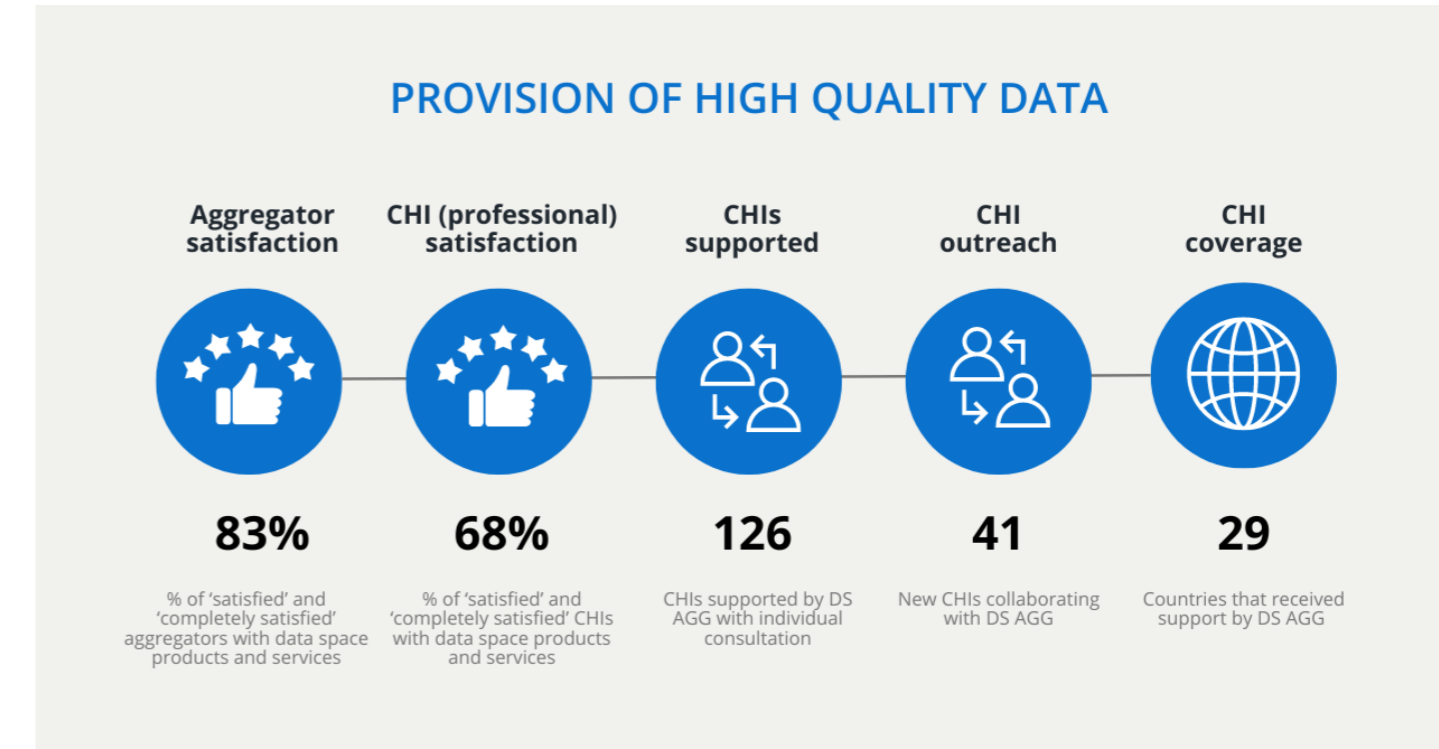
Provision of high quality data (Aug 2023 - Sep 2024).
Europeana Foundation. August 2023. CC-BY-SA

EF completed a satisfaction survey with aggregators with a very good satisfaction rate of 83% of respondents being 'satisfied' and 'completely satisfied' (with responses from 37 accredited aggregators). We asked about satisfaction with support and feedback offered by EF during aggregation and the quality of related products and services and also included a section in the survey

to allow aggregators to map their roles to the roles in the data space (related to roles introduced by the DSSC blueprint).

We also ran a survey that measured the satisfaction of CHIs. Results demonstrated a satisfaction rate of 68% of respondents being 'satisfied' and 'completely satisfied' (derived from a total of 8 CHIs, primarily those signing up to the Share your collections page, and 156 cultural heritage professionals using both Europeana Pro and Europeana.eu). More direct communication with CHIs about what the EI and data space can offer to CHIs and more awareness and knowledge of products and services can support CHIs getting a richer and more rewarding experience (this is planned to progress in Y3, for example with new email workflows).

Entity collection. EF and DS AGG worked together to improve the coverage and quality of the Entity Collection (EC) through semantic enrichment. In Y2, we included place and century pages into the metric for entities and added new organisation entities to the entity collection which resulted in an increase in number of items linked to (at least) one EC (14.5% increase) and an increase in number of entity collections with items (92.3% increase).

We observe that almost all entities in the entity collection are supported at least by one European official language. Almost 90% of the entities contain an English label, and more than 70% support some of the most frequently used languages on the Europeana website besides English: Spanish, German and French.

Aggregate 3D content. The Europeana DS consortium, in collaboration with a wide range of partners, developed a series of activities to support CHIs with the integration of 3D into the data space. Most notably, the Twin it! campaign, a wider 3D campaign in which the Ministries of Culture of the EU were invited to submit one 3D digitised heritage asset to the data space, contributed to the growth of 3D content in the data space (see 3D Twin It gallery).

ENTITIES ON EUROPEANA WEBSITE

38.7 M+
Records linked

52,331
Entity collections

Coverage of entity collection on Europeana website (Aug 2023 - Sep 2024). Europeana Foundation. August 2024. CC-BY-SA

3D ON EUROPEANA WEBSITE

4,792
3D records

157
3D records

87
CHIs sharing 3D

38
New CHIs sharing 3D

3D data on Europeana website (Aug 2023 - Sep 2024). Europeana Foundation. August 2024. CC-BY-SA

In Y2, the total number of high-quality 3D items (tier 2+/A+) published on the Europeana website has increased from 4,635 to 4,792 (3.4% increase, 157 items). The largest contributions were made by the Share3D platform (for example) and the MINGEI project (for example). Collaborations with ongoing projects like Eureka3D and 5DCulture were also important for bringing more 3D content to the data space.

In Y2, we increased the support for more 3D formats and developed a framework for easily adding additional support if and when needed. Previously, 3D records were expected to contain a link to a viewer (preferably embeddable) where the 3D model can be viewed. Metis now also appropriately recognises direct links to downloadable 3D content.

We also designed a new data profile for the provision of embeddable content (i.e. content for which a link to a viewer is provided that could be embedded in the Europeana website) and implemented an MVP version of it as part of the data aggregation pipeline. This solution is adaptive and generic, allowing a better user experience for embeddable sources on the Europeana website, while allowing us to eliminate a maintenance-heavy component in the future. This particularly benefits 3D resources, as support for 3D viewers was previously lacking.

We gathered data about 3D repositories within Europe. The data indicated that there are many emerging and developing repositories in Europe which aim to handle 3D data. Of those repositories which are already functional and handling 3D data they are generally at a mature stage. The amount of 3D data held by the repositories was small, compared to the targets for the data space in 2030. The work resulted in recommendations to inform supply and demand work in the data space, as well as being able to help future data providers store their data.

The 3D Working Group, with representatives from INCEPTION, CARARE, TMO, and PHOTOCONS supported the delivery of all 3D related outcomes (e.g. related to the Twin it! campaign, updates to the Knowledge Base for 3D, report on 3D repository across Europe, and EDM).

The Knowledge Base pages about the criteria for 3D content were maintained. In addition, a publishing guide specific for 3D content was developed as a collaborative effort of the 3D working group. It was the main guidance also shared with Member States (MS) to support the Twin it! campaign.

Automated approaches towards data quality

The consortium worked on automated approaches for addressing data quality issues at scale. EF completed the application of image resolution enhancement and 1.3M Tier 0 images were enhanced. These are now available in the Europeana website, though only when using the filter to select items "Not meeting publishing criteria" (Tier calculation has not been updated yet).

Enhanced image   *Original image*

We also resumed work on watermark detection, finished training our machine learning model and applied it on a sample of all datasets that contain items with type IMAGE (these datasets collectively represent 29M items). A manual evaluation of this sample allowed us to get a clearer picture of how many datasets that are partly (101 datasets, i.e. 7.2%) or fully (66 datasets, i.e. 4.7%) impacted by the use of watermarks. Our evaluation also attempted to determine which of these watermarks are 'intrusive'. Results have been presented to the aggregators in the Data Quality Committee for further assessment.

We have continued experiments on automatic detection of the language of metadata, which plays a key role in automatic translation. We have tested whether using different hints from the metadata can improve the accuracy of detection. We have also evaluated whether OpenAI's generic ChatGPT service can bring an improvement; first results indicate that its level of quality is comparable with the (free) alternatives. Finally, we have implemented an update of the existing (production) process of normalising values of the dc:language fields and language tags that are already present in the metadata, after we had spotted that updating its list of target language codes would bring better coverage of the (many) languages that can be mentioned in the data space metadata.

DATO investigated the hypothesis of using multilingual LLMs (Large Language Models) to disambiguate between terms when performing an enrichment task as an alternative to other approaches such as vector embeddings. The investigation focused on assessing open-source / free options for multilingual LLMs to avoid costs and assessed their performance against ground-truth data that was built in the scope of the Debias Project. The results of this work will not only allow us to make a conscious decision on the right approach to take forward for disambiguation but also benefit other AI related activities that make use of LLMs and are now considering proprietary / commercial solutions such as ChatGPT.

EFHA has carried out experiments using Large Language Models (LLMs) to generate descriptions of a sample of its data partner's collections (200 items), based on available metadata values. This is intended to palliate shortcomings of the metadata when it misses user-friendly, textual descriptions. The quality of results (in terms of completeness, fluency and correctness) as well as performance (computing time) vary greatly. But some configurations, notably OpenAI's ChatGPT 3.5 and Meta's Llama 2-7b, manage to produce descriptions of acceptable quality and will be considered for deployment at a larger scale.

EFHA has also applied and evaluated different AI-based tools to enhance the resolution of low quality images. Out of eight pre-selected tools, four benefited from in-depth evaluation on 80 representative images, notably trying to assess the quality of their output for different types of images: prints, black and white photos, etc. One tool (SwinIR) was deemed to produce higher-quality results, while being slower. It has been applied to enhance the resolution of approximately 15K lower quality images (Content Tier 0 and 1 of the Europeana Publishing Framework) from 10 data providers.

Finally, we updated the evaluation methodology which helps us to assess the quality of all enrichments that are contributed to the data space. Notably, we require data space projects to document and evaluate their enrichment processes before they submit enrichments to the data space.

CAPACITY BUILDING
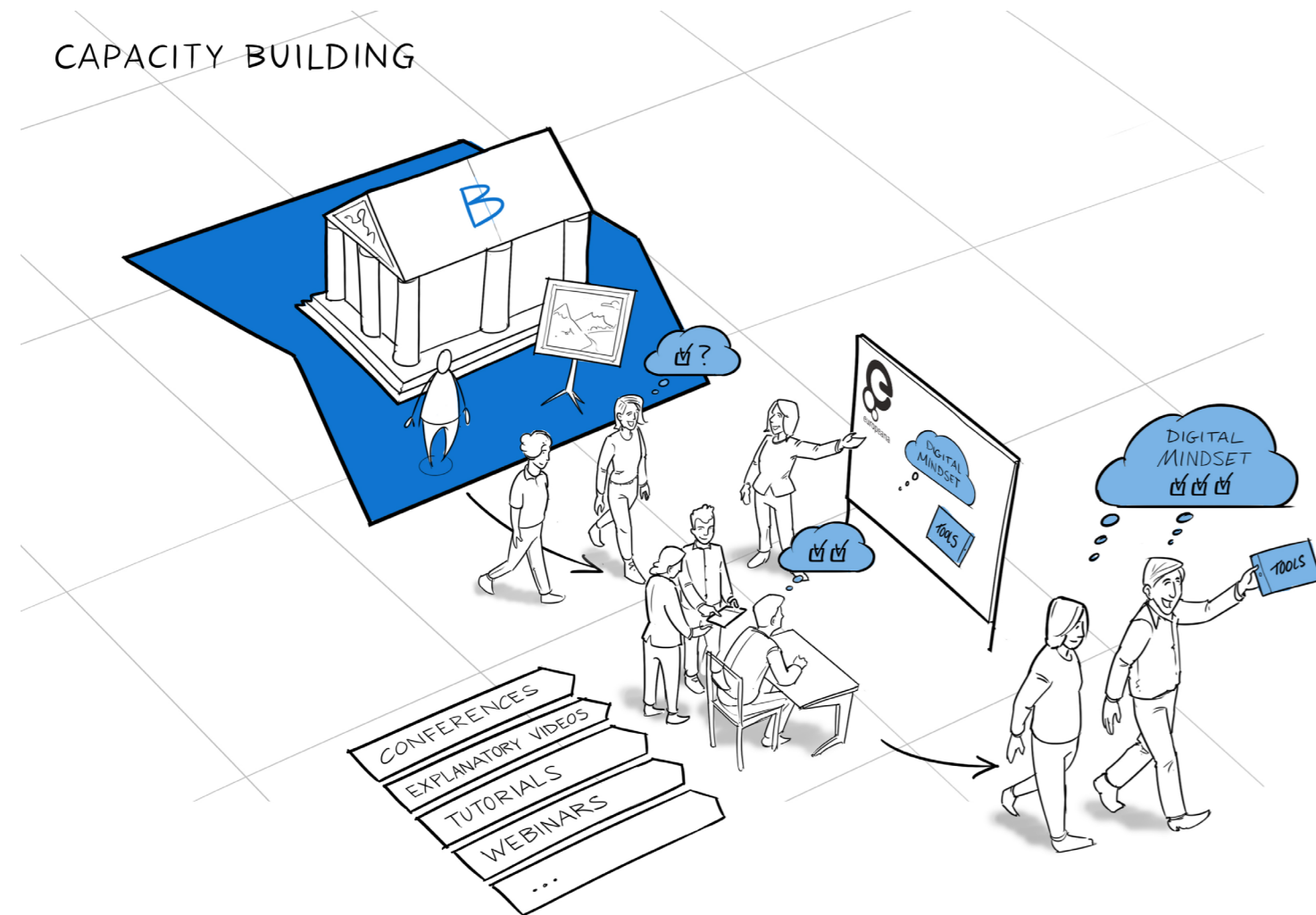
Capacity building. Sketchy Business. 2023. CC-BY-SA

Capacity building and reuse

The Europeana DS consortium aims to strengthen the capacity of professionals and reuse communities working with digital cultural heritage. This year, we worked to develop capacity among cultural heritage professionals to create high-quality data that can be used in a wide range of user scenarios. We collaborated closely with the Europeana Network Association (ENA) and the Europeana Aggregators' Forum (EAF) to develop training, events and interaction programmes which support cultural heritage professionals to use the tools and services provided by the data space and become agents of change in their organisations and in the sector.

We also worked towards developing capacity for the use and reuse of high-quality data in education, academia and research and developer communities.

Cooperation throughout the data space

The Europeana DS consortium supported and further developed the effective coordination of activities across the data space, with specific emphasis on leveraging the synergies of the European Initiative (EI), including Europeana Foundation (EF), Europeana Network Association (ENA) and the Europeana Aggregators' Forum (EAF).

Develop methods of cooperation. The model of cooperation developed during Y1 is implemented through use and was evaluated in Y2. The evaluation identified elements which require further improvements (e.g. governance mechanisms). The Initiative continues to host regular meetings to discuss actions that support the development and implementation of the data space. The identified mechanisms for cooperation - a joint thematic programme, community engagement and joint project

and partnerships - shape the content of activity and discussion; for example the progress of the Country Groups pilot is regularly discussed.

The Country Groups (CGs) pilot project (running from 1 Jan until 31 Dec 2024) aims at improving national cooperation throughout the data space in three EU member states: Bulgaria, Italy, and Slovenia. These pilot country groups bring together Europeana Network Association (ENA) members, aggregator representatives and others, including those who wish to reuse materials from Europeana.eu. This decentralised approach aims to complement the work in Member States happening in other contexts. For example, Country Groups have worked on initiatives like Twin It! and translations of outcomes from various ENA communities.

The data space currently offers products and services that add value to CHIs and professional audiences. In Y2, we documented the offer of products and services, and re-evaluated the current offer and how it is presented to audiences. This resulted in recommendations that aim to increase the value of the offer for CHIs (for example, to re-evaluate how specific products and services are presented in the data space to facilitate the best possible customer journeys, or how to make external tools more visible in the data space offer).

Provide secretariat for EAF and ENA. EF continued to provide secretariat functions and financial and administrative support for Europeana Network Association (ENA) (including Management Board and Members Council) and managed ENA membership (including community management, Task Forces, and Working Groups). The 2023 ENA annual report offers information about activities over 2023 (e.g. ENA General Assembly, Nov 2023). The ENA currently counts almost 4,900 members, with 76% of them stating that they are 'satisfied' or 'completely satisfied' with the ENA (257 responses). We also asked questions to allow a greater insight into what ENA members are looking for from their membership and to better understand the backgrounds of those responding. The key values that the

EUROPEANA NETWORK ASSOCIATION (ENA)

ENA membership satisfaction

4,867 ENA members

471 Increase in ENA members

76% % of 'satisfied' and 'completely satisfied' ENA members
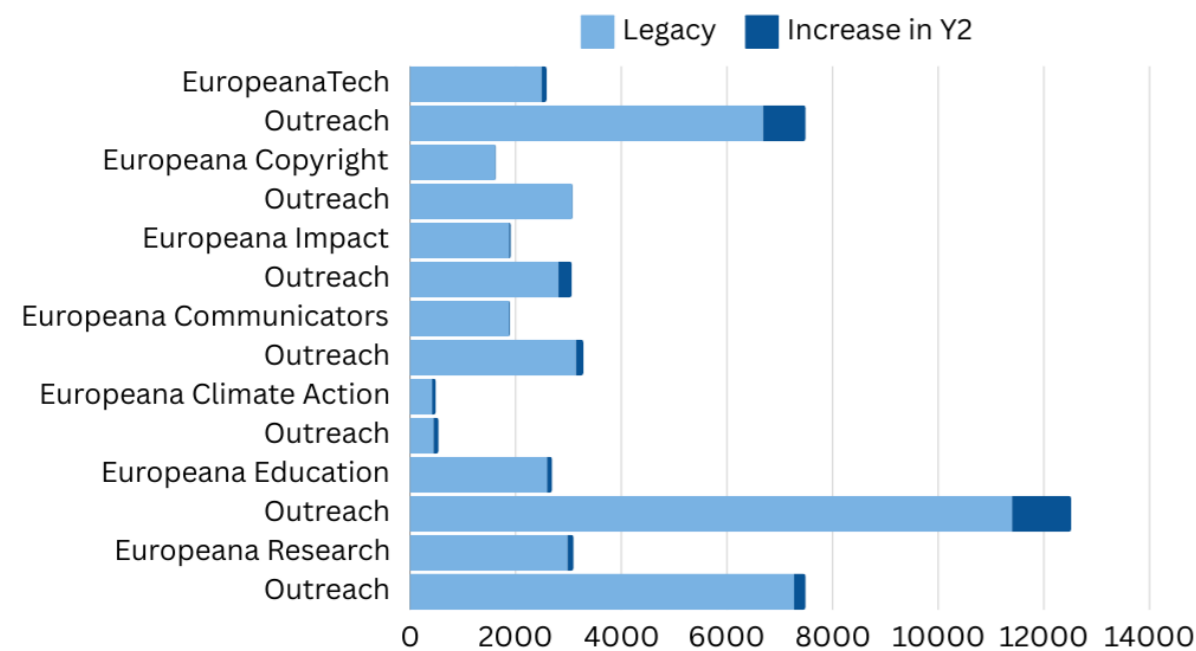
468 Active ENA members

ENA membership and impact of activities (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

ENA was reported to have brought to more than half of responding members are around practical knowledge and networking. Likewise respondents find events and opportunities in networking and training most important. Comments indicate interest in more inclusive or country-based activities and more communication about opportunities in the sector and network.

ENA Members Council elections took place between Nov/Dec 2023 with new members being (re) elected. About 12% of the eligible voters participated in the elections. In Jan 2024, new candidates from among Councillors were appointed to fill open seats on the ENA Management Board.

ENA COMMUNITIES

Legend: Legacy | Increase in Y2

Categories (top to bottom):
- EuropeanaTech
- Outreach
- Europeana Copyright
- Outreach
- Europeana Impact
- Outreach
- Europeana Communicators
- Outreach
- Europeana Climate Action
- Outreach
- Europeana Education
- Outreach
- Europeana Research
- Outreach

X-axis: 0, 2000, 4000, 6000, 8000, 10000, 12000, 14000

The graph shows for each community 1) the amount of ENA membership (top bar) and 2) the amount of people reached via dedicated communication channels (such as newsletters, social media channels, and discussion/mailing lists) (bottom bar)

ENA communities membership and outreach (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

The seven established ENA communities continued to grow in terms of membership and the number of people reached via community-specific communication channels (see graph). ENA community members convened to discuss the collection of data relating to measuring community engagement, across communities and within each community. Additional metrics were proposed that are going to be tested and evaluated in Y3.

In Y2, EF supported six Europeana Initiative-wide Task Forces (TFs) and 10 Working Groups (WGs) (one newly launched in Y2 the Innovative Operating Models Working Group) on topics related to data quality, copyright, (data) governance, environmental practices, impact and decentralised aggregation. In Aug 2024, we counted 468 people contributing time and expertise to the Europeana Initiative (e.g. being active in TFs, WGs and governance or responding to calls to action to engage with other activities).

EF also supported the Europeana Aggregators' Forum (EAF) (including its Steering Group and meetings). The 2023 EAF activity report offers information about activities over 2023 (e.g. EAF meeting). There were two EAF outreach events in Nov 2023 and Jun 2024 focused on topics including data publication, data dissemination and reuse. These events showed CHIs how they can engage with and share their data with the data space, as well as how users and reusers can engage with the data, and how aggregators support different reuse scenarios during data preparation and processing. In Y2, EAF concluded the accreditation process for three new aggregators: Slovakiana (Slovakian aggregator), Catalònica (Catalan aggregator), and Euskariana (Basque aggregator). The EAF Steering Group also completed recommendations for an enhanced accreditation scheme as a stepping stone towards a new accreditation scheme for aggregators in the data space. Besides others, it is recommended moving from accreditation for fulfilling a certain role to accreditation for the products and services and developing a set of accreditation criteria specific to the various types of products and services offered within the data space. This work will be continued in Y3 to further implement an enhanced EAF accreditation scheme.

Support national digital strategies to increase high-quality data . EF, together with the Member State holding the rotating presidency of the Council of the EU, organised conferences aimed at the CEDCHE Expert Group members, relevant experts and policymakers to discuss important topics for the development of the data space, mainly on 3D digitisation. In Y2, we organised two events, directly contributing to the 'Twin it! 3D for Europe's culture' campaign'.

The Spanish Presidency Europeana conference 'Accelerating 3D in the common European data space for cultural heritage: Building capacity for 3D' (Oct 2023) was co-organised in collaboration with the Spanish Ministry of Culture and Sports. The event promoted 3D capacity building for Member States to step-up 3D digitisation efforts and to make more 3D content available through the data space. It highlighted some of the best practices for utilising 3D technologies. The report shares insights, learnings and resources around 3D and digital cultural heritage. The event saw a very high satisfaction rate with 88% of participants being 'satisfied' or 'completely satisfied' with the events.

The achievements of the Twin it! campaign were celebrated during a high-level event (May 2024) in Brussels, co-organised by the Europeana Commission and EF under the auspices of the Belgian Presidency. The event unveiled the collection of heritage 3D models submitted by the Member States and celebrated their efforts. Various Ministers of Culture presented their Twin it! 3D models. The campaign efforts and the event were very well received and valued by the participants. In particular they praised hands-on learning and capacity building around 3D digitisation processes which was made possible through the campaign, raising awareness, and generating enthusiasm and momentum.

To keep the Member States informed about their contribution of content to the data space, we extended the Statistics Dashboard with a new Country Page showing and tracking the progress of

EU ministers of culture at the High-level event of the Twin it! 3D for Europe's culture campaign, 14 May 2024. Europeana Foundation. CC-BY SA. 2024

Member States against the targets set in the Recommendation 2021. This page allows a user to see how a Member State is making progress and where extra effort could be directed to achieve the target.

The Europeana Initiative has set a Member States engagement strategy 2026 which supports the Member States in meeting the ambitions of the data space and the 2021 Recommendation targets. The strategy will be executed in Y3 and Y4, for example, by improving data space services for all Member States, as well as in specific areas of need or interest for a number of Member States through tailored strategic plans. The Initiative will prioritise a few countries based on their engagement, needs, interests and readiness/willingness. Some of the key activities to support this strategy include: a cross-presidency thematic campaign and presidency events, Country Pages in Statistics Dashboard to track progress towards data targets, advocacy, capacity building resources, promotion of multilingual search feature in coordination with relevant Member States, and Country Group activities. The strategy will be supported by a concerted approach of communication and collaboration - with and among all the actors of the Europeana Initiative, the Member States, specifically in the framework of the CEDCHE, and with the European Commission's support.

Finally, we informed the Member States of the relevant news, updates, and activities via our dedicated Member States newsletter. Country specific reports were updated and published in Feb and Aug 2024.

Identify needs of user groups

In the past year, we explored the needs of professional audiences in the cultural heritage sector as well as the needs of potential groups interested in reuse of cultural heritage data.

User research among professional audiences. In Y2, we supported various quantitative data gathering activities across EF and the Initiative (e.g. on environmental sustainability practices, persistent identifiers and various satisfaction surveys) where we received a total of 521 responses from cultural heritage professionals or representatives of cultural heritage institutions or aggregators.

To support our developments related to 3D, EF explored 3D use cases and current practices from the cultural sector, to inspire CHIs to engage in more 3D digitisation based on the benefits 3D digital objects will bring to the CHI and the wider population. In addition, the report contains a number of recommendations, for example to include more 3D digital objects in editorial and to introduce 3D experiences as a form of editorial. We also supported a survey of 3D repositories in Europe, together with Time Machine Organisation, with a view to better understanding where 3D digital objects are (or could be) accessed.

This year, we looked at previous research and survey data pertaining to cultural heritage professionals and their institutions via a meta analysis (the past five years) to better understand the needs and requirements of these groups. Among the main needs identified for cultural heritage professionals are those related to training resources on digital preservation/ curation, digital storytelling/ reuse of collections and digitisation/ cataloguing - essentially an offer tailored to the individual and not specific to data aggregation. On the other hand, data providers need more support around aggregating data and a stronger CHI specific offer to make the benefits of data sharing

clearer. The report suggests that the Europeana Initiative and the data space can hold clear value for cultural heritage professionals and institutions acting as our data providers, for example, through the offer individuals can access if they join the network, but these values are not always clearly understood by audiences. The data space has many products and services and potentially more could be done to explore, demonstrate and communicate where and when these products and services are designed for the CHI and/or cultural heritage professionals audience and how they meet identified needs.

User and market research to foster reuse. In Y2, we explored two new audiences with reuse potential: tourism and networks/communities working with writers. The focus for the new audiences was on a B2B (business-to-business) approach to reach as many people within those audiences as possible.

We developed a new template for audience profiles which identifies audience needs and opportunities for promoting reuse to users. It also fosters closer collaboration within both technical and audience-facing teams to answer audiences' reuse needs. The template also identifies benefits for B2B networks and the shared goals and touchpoints between them and the Europeana Initiative and the data space.

We developed audience profiles for two new areas of reuse and validated them with stakeholders to verify if their challenges and goals are reflected in the profiles. From the responses received, the audience profiles can be seen as an accurate reflection of the audiences at this point in time.

'[This] is a great summary of the writing industry and of the potential relationship with Europeana and I think the idea of being part of a community is a particularly valuable shared goal for writers as often the business can be quite isolated.'

Jake Hope, children's author

Additionally, we set-up a reuse pilot with the creative writer's audience to explore how networks and organisations that support writers can introduce the Europeana website as a resource for inspiration and research. This resulted in three different activities co-organised by EF and external organisations, to engage their audiences with content made available through the Europeana website, such as The Murmuration of Words, a postal poetry project, for which an image from the Europeana website inspired the formulation of poems; Eurocon, two creative sprint sessions (1, 2) aimed at horror, sci-fi and fantasy writers; Stockholm Writers Festival - newsletter article sent to a subscriber base of 2,100 people.

We also conducted desk research and interviews with stakeholders in game development to learn more about the value the data space could bring by marketing its products and services to game developers. This desk research resulted in identifying opportunities and challenges for this audience, which will be explored further in Y3.

EF identified and interviewed four individuals / projects who regularly reuse collections from the Europeana website (e.g. Celebrating airport architecture on Instagram with collections from Europeana.eu). Finally, in aligning with the development of the Europeana Impact Model, we investigated (through a literature review and internal consultation) how we might better measure the instances and value of reuse amongst several priority reuse audiences.

We assessed the audience engagement model followed in Y2, and developed an approach to audience strategy and outreach for Y3 and beyond. The developed approach for Y3 includes the validation of reuse potential of data upfront, and the prioritisation of outreach activities that nurture a more direct connection with audiences – hopefully leading to the production of trackable reuse cases that can yield useful learnings for EI and partners.

Awareness and engagement

EF built awareness and engagement with the activities in and around the data space among professional audiences, while ensuring a strategic approach to marketing and communications.

Ensure strategic approach to marketing and communications. Europeana Pro is our primary communications platform for professionals and supports the cultural sector in the provision of interoperable digital cultural heritage. In Y2, Europeana Pro saw almost 265,000 visits, and 80% of users reported being 'satisfied' or 'completely satisfied' with the website.

We published regular posts through Europeana Pro News, sharing the latest news from across the Europeana Initiative and data space, promoting key campaigns and sharing learning on topics relevant to the digital transformation of the cultural heritage sector. Monthly themes explored the data space, 3D and the Twin it! campaign, aligned with editorial published on the Europeana website (e.g. Women's History Months), promoted specific products and events (e.g. Digital Storytelling Festival) or data space supporting project activities (AI4Culture and DE-BIAS), and showcased work from and of interest to ENA communities (EuropeanaTech series).

We amplified activities via newsletters, mailing lists and social media (Twitter - now called X, and LinkedIn) and via other relevant channels (e.g. via project partner' channels). We revised our approaches to social media to ensure that we remain relevant and easily discoverable and to support organisational and data space objectives.

In Mar 2024, we released a data space landing page and promoted it to various audiences (e.g. via the news article on Europeana Pro News). The landing page gives increased visibility to the data space, presents benefits and opportunities to CHIs and other data spaces, and will share related

developments and activities. We foresee that this page will support positioning of the data space and communication around it, facilitate engagement by professional audiences and encourage synergies with other data spaces.

*Europeana Pro traffic and satisfaction
(Sep 2023 - Aug 2024).
Europeana Foundation.
August 2024. CC BY-SA*

Where appropriate, our work was supported by the Europeana Communicators Community, for example, with actions to help communicate about the data space more widely or to support multilingualism via a translation pilot with EF to check machine translations of blogs. The community also supported the translation of the Seven Tips for Digital Storytelling into four more languages - Albanian, Catalan, Dutch and Romanian (now available in 14 languages).

A detailed overview towards communication and dissemination activities is available in the DS. Communication and dissemination plans.

Engage professional audiences. EF refined the tools and platforms used to engage with professional audiences. This year we completed a strategy for platforms for professional audiences focusing on content and editorial approaches, to support clear user journeys between platforms in

the data space as well as consistency in editorial processes (e.g. ensuring clear user journeys between Europeana Pro and the Knowledge Base).

We also updated the Europeana Pro strategy to shape EF's approach to developing, evaluating and managing Pro in line with our strategy and objectives. The yearly Europeana Pro survey (251 responses) showed that our audiences have multiple motivations to visit the website (including topics like Artificial Intelligence (AI), storytelling, digital curation, digital preservation, digitising, cataloguing metadata and emerging techniques such as photogrammetry, laser scanning and 3D modelling). This survey now runs throughout the year to provide richer results.

We explored stronger connections for collaboration between the members of the ENA, EAF and EF through improvements of our CRM systems. We extended the CRM to include more types of audiences. Having more audiences available in one system makes it possible for us to see the different affiliations each individual and institution has with the Europeana Initiative. We can use this information to see how engaged people are and promote services to them to increase their engagement and participation. Based on investigations for opportunities for increased community collaboration done in Y1, we worked together with ENA and EAF on how events and communities can be used to further enhance collaboration and further engaged in discussions around a communication tool to enhance cooperation and collaboration.

The Knowledge Base (KB) saw a steady increase in use over the past year, resulting from more pages being added and increased awareness of the tool over time. In Y2, the KB saw almost 16,000 visits (80% increase compared to Y1). The top three most viewed pages are the EDM mapping guidelines, Publishing Guide for 3D content, and the general Publishing Guide, information that is highly relevant to users and data providers. The biggest addition to the KB in Y2 was the migration of the API documentation and the addition of the Copyright management guidelines for cultural heritage institutions.

EVENTS AND TRAINING

Events and training	Reach	Satisfaction	Knowledge transfer	Practical knowledge
77	**4,720**	**92%**	**81%**	**96%**
Events and training held by Europeana DS consortium, EAF, and ENA	People reached with events and training	% of 'satisfied' and 'completely satisfied' participants	% of participants reporting that the activity helps them stay up to date with best practices and new trends	% of participants reporting that the activity enables them to learn knowledge, skills and information they can use in their job

Events (including instructor-led training events) (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

Develop event and training programming. In Y2, EF, EAF and ENA organised 56 events, welcoming more than 4,000 participants. Events supported the various areas of work across the data space. The events were very successful with 92% of survey respondents being 'satisfied' and 'completely satisfied'. One highlight was the EuropeanaTech conference - Explore, Engage, Experience: cultural heritage in the data space and beyond (Oct 2023, 719 participants) focusing on themes of importance to the cultural heritage sector such as digital collections infrastructures and linked open data, AI, 3D and multilingualism.

We continued to improve our in-person and online events programme, integrating hybrid meetings where possible, and coordinated activities of the international Events Manager Group to share good practices, as well as coordinating the timing of major conferences.

We assessed current data collection and impact assessments to extract learnings and recommendations for our event management. For example, we improved our practices through standardised impact assessment and data collection emphasising an ongoing learning and improvement process across the organisation.

Capacity building as a service

We further developed capacity building tools and services and managed and improved mechanisms for the training programme.

Develop capacity building tools and services. With support of the Capacity Building Working Group, including members of ENA and the EAF, EF continued to develop and manage the implementation of the Europeana Impact Framework (EIF) and the Europeana Capacity Building Framework (ECBF) and implemented their components across the data space.

In Y2, we further refined the core elements of the ECBF to harmonise capacity building methods, activities and evaluations undertaken for key Europeana products and services and changes associated with the deployment of the data space.

We revised and published a new online Europeana Impact Playbook, developed training materials (e.g. a four-part training series for data space project partners), and promoted the offer across the impact community. EF supported the Europeana Impact Community, most notably by organising Impact Community Cafés to publicise and improve the uptake of the new online Impact Playbook and webinars (e.g. Theory, change and growth: the story of the Impact Playbook, Jun 2024).

In Y2, we developed an Impact Model for the Europeana Initiative (V1) which aligns with the Europeana Initiative's (EI) vision towards 2030 (especially related to the triple transformation with digital, social and green interconnected dimensions). It sets out different types of value chains that all activities support and, in the future, should support. The Impact Model is built to help us evidence change in heritage professionals and other stakeholders who experience and use data space products and services. Five use cases were developed, each with their own impact pathway that aligns to the Impact Model, including the updated impact pathway for the training programme, and pathways for ENA communities and Member States engagement.

EF further developed the content, delivery and engagement mechanisms for offering training to our audiences in a systematic way. We launched a Training Platform, initially as a pilot, to test the technical capabilities and workflows suitable for the Europeana ecosystem. Existing training resources were adapted and published on the platform, and users were observed while making use of the platform. This resulted in positive feedback and outcomes. In addition to satisfaction surveys, processes were developed and implemented to make use of the existing performance data of the Training platform to improve the user experience of trainees and the quality of training resources.

Facilitate the provision of high quality data

Deliver training programme. The consortium expanded and delivered a training programme with a focus on aggregators, data providers and users of digital cultural heritage. In Y2, we organised 22 instructor-led training sessions (including Europeana Academy training sessions) which reached 706 participants with a high average satisfaction rate of 89%.

In Y2, we piloted and evaluated the Europeana Academy with a series of instructor-led training sessions via the Europeana Training Platform to build capacity in professionals working with and around cultural heritage. The results from the pilot are positive and many lessons were learned. One recurring challenge was the amount of people that registered, confirmed their participation after registration and did not attend the training. Apart from all the learnings, all trainers and participants were very satisfied and acknowledged the added value of having instructor-led training in addition to offering self-paced training resources.

EF supported aggregators to develop training that contributes to the provision of high-quality data. For example, AIT Graz developed training resources about IIIF image conversion and on EDM to IIIF manifest creation. MCA created an introductory course on metadata mapping to EDM and Photocons created a course on 3D digitisation guidelines (alpha stage). In addition, an introductory course on data spaces was developed together with CAPG.

Beside the instructor-led training sessions we also published 13 courses for self-paced training on the Training platform (new and updated resources) related to Europeana's APIs, the basic functionality of the Europeana website, storytelling, IIIF, EDM, 3D, copyright, and the Metis Sandbox. Some of which were also used in the pilot of the Europeana Academy.

Orchard at La Louvière by Finch, Alfred William - Finnish National Gallery, Finland - CC0.

Support the transfer of knowledge between professionals. The EF, together with EAF and ENA, promoted training and knowledge transfer opportunities across the EI, through newsletters, community activities and periodic events. Activities paid specific attention to identifying and delivering opportunities that connect members of the EAF and ENA such as joint meetings and through the Country Group pilot.

We organised large knowledge transfer events, including the EuropeanaTech conference (Oct 2023), the Spanish presidency event (Oct 2023) and Belgian presidency event, presented as the final event of the Twin It! campaign (May 2024), ENA and EAF events such as the ENA General Assembly (Nov 2023) and the EAF outreach events (Nov 2023 and Jun 2024). We also organised events that promoted reuse, including the Digital Storytelling Festival (May 2024). We offered knowledge transfer activities such as the copyright office hours and community events such as the Europeana Cafés with topics focused on impact assessment and Twin it!.

We continued our collaboration with the European Students Association for Cultural Heritage (ESACH) and provided support to emerging professionals. For example, offering a bursary scheme we supported ESACH members to attend the EuropeanaTech conference. The grant recipients organised networking activities during and after the conference. EF supported ESACH by reviewing and disseminating activities (e.g. 'Youth for the future of cultural heritage in Europe' by ESACH and 'New Professionals' Twin Talks' by EF).
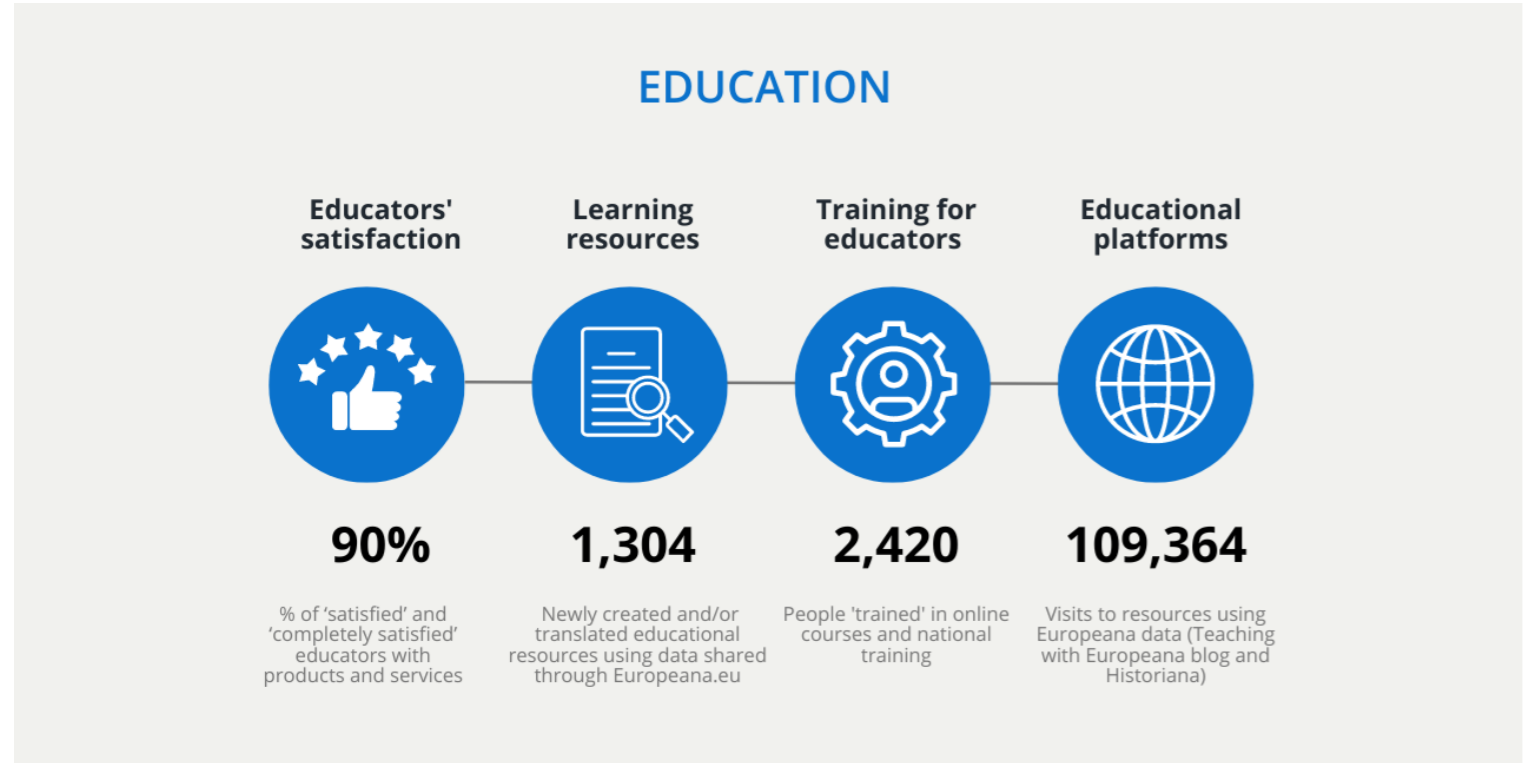
Our work was supported by the Europeana Climate Action Community. In Y2, the Environmental sustainability practice Task Force undertook a survey to explore sustainable practices in digital preservation, challenges and needs for support and published an interim report reflecting insights that emerged from the survey.

Facilitate the reuse of high-quality data

Based on user research done over the past years, we know there are audiences who consistently use and reuse digital cultural heritage. Targeted efforts were undertaken to engage with educational communities, academic and research communities, as well as developer communities and API customers. For other audiences (e.g. tourism, cultural/creative industries) we explored and piloted the potential for reuse cases.

Engage with educational communities. The future citizens of Europe, individuals, students and educators in primary and secondary institutions across Europe, can benefit from the cultural heritage materials offered in the data space. While the materials themselves can be useful, EF, together with EUN and EuroClio worked to raise digital skills and capacity, and to increase the use of educational resources using data shared via the Europeana website. In Y2, EUN and Euroclio 'trained' a total of 2,420 people via online courses and national training.

Overall, activities resulted in 1,304 resources created with data shared through the Europeana website (including 1,268 newly created and 36 translated educational resources) which were or will be published on the Teaching with Europeana blog and Historiana. Educational resources published on the Teaching with Europeana blog or Historiana received over 109,000 visits in total in the past year. EUN measured an excellent satisfaction rate of 90% on the question 'I will recommend Europeana resources for education to my colleagues' as part of the MOOC evaluation (25 responses from participants responding on the Latvian MOOC).

EDUCATION

Educators' satisfaction

90%

% of 'satisfied' and 'completely satisfied' educators with products and services

Learning resources

1,304

Newly created and/or translated educational resources using data shared through Europeana.eu

Training for educators

2,420

People 'trained' in online courses and national training

Educational platforms

109,364

Visits to resources using Europeana data (Teaching with Europeana blog and Historiana)

Activities and impact related to educational communities (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

Through events, communication and dissemination, EF together with the Europeana Education Community, embedded digital cultural heritage in education and fostered innovation. One highlight this year was the third edition of the Low Code Fest 2024 which focused around the theme of the Artemis missions, and engaged over 60 students with space exploration and STEM topics in combination with digitised cultural heritage. Capacity building sessions and a training module were developed to teach students and teachers about Europeana's APIs without the need for coding knowledge. Six teams entered the Low Code Fest competition, of which three were selected to

present their results at the Low Code Fest final event (Jun 2024). As a result of this year's event, secondary school students have received the knowledge and tools needed to reuse data and participate in the data space.

Another highlight this year was the Built with Bits 3 challenge (2024), organised in collaboration with the Ministry of Culture of Spain and AIDI. The challenge focused on capacity building for educators, students and cultural heritage professionals by giving them tools and resources to work in new virtual worlds, helping them to build the new Web 4.0 and implement important elements of the New European Bauhaus (including multilingual learning resources on how to use platforms like Mozilla Hubs, Roblox, Spatial.io, Aptero and Minecraft). 12 selected projects made it to the finals, co-creating virtual museum spaces in collaboration with local public institutions as well as interested local citizens - from a virtual escape room, to an open-world in Roblox, and a 3D recreation of a church. A writeup of all the selected projects and lessons on how creating virtual spaces can be replicated by other audiences can be read on Europeana Pro.

EF also contributed educational resources to the worldwide campaign Open Education Week (Mar 2024) and showcased the Digital Storytelling Festival in the ALL DIGITAL weeks campaign's calendar of partner events (May 2024).

European Schoolnet. In Y2, EUN revamped the Europeana MOOC Digital Education with Cultural Heritage to make it more inclusive to different audiences and run it in English and for the first time in Dutch and Latvian. In total, 290+ people registered for the courses, 111 participated, and 31 successfully completed it, meaning they designed an Europeana learning scenario (e.g. Bērna loma no senajiem laikiem līdz mūsdienām (LV-CUR-795). 93% of the participants rated the overall value of the course as "Good" or "Very good" and 92% agreed that they will use the ideas and examples presented in the course.

Developed within the framework of the [2024 STEM Discovery Campaign](#), EUN organised the [Scientix Digital Cultural Heritage Award](#) supported by Europeana (Feb - Apr 2024). Through this Award, participants were invited to use digital cultural heritage resources in their educational activities and share their stories of implementation, showcasing how Europeana learning scenarios can be embedded and implemented in an educational context. This year, more than 4,600 submissions were received, among them 381 entries from 21 countries were eligible for this award which resulted in [21 winners](#) (for example Implementation of '[Nature in Spring](#)' (SOI-MT-501).

To support and scale up the use and reuse of existing resources and increase further national communities' outreach, Europeana Education Ambassadors conducted training courses and other activities at a local and national level. During these activities, participants had the chance to learn about the Europeana Initiative, including how to search for and use resources available on the Europeana website and the Teaching with Europeana blog, and how to create new learning resources, such as Europeana Stories and micro-stories of Implementation. 65 activities were conducted in total, including 51 training courses. The activities took place in Belgium, Croatia, Greece, Italy, Latvia, Malta, Portugal, Romania, Spain and Turkey reaching over 2,240 educators with an indirect impact on more than 26,880 students.

As a result of this year's activities, about 140 stories of implementation were collected and are published on the [Teaching with Europeana](#) blog in dedicated blogs, for example Implementation of [This Time I am Voting](#) (SOI-HR-487). Moreover, over 1,100 micro-stories of implementation were collected and are accessible through the [Digital Cultural Heritage Story map](#).

[Historiana](#). To build capacity among educators, EuroClio delivered various activities in Y2. EuroClio developed an [online course](#) that assists educators to create and share e-Learning Activities on Historiana using Europeana.eu content and that promotes quality history or citizenship education and allows students to improve their historical thinking skills.

Euroclio also organised a train-the-trainer event (13 participants) to teach interested history education and cultural heritage professionals to create high-quality e-Learning resources on Historiana, specifically to use source collections in education, and create accompanying [partner pages](#). Additionally, Euroclio organised five national training sessions to enhance the ability of teachers and other education professionals to use the Historiana platform effectively. The training was held in Finland, Greece, and Slovakia reaching in total 103 participants.

Finally, 10 new learning resources were added to the Historiana platform, focusing on e-Learning activities that explore various aspects of life under communism and its cultural and environmental impacts in Central and Eastern Europe (in Czech, Hungarian, Polish and Slovak) (for example, [After the War](#)). A series of translations were completed for the Historiana platform to enhance its accessibility across various languages. 16 source collections and 20 e-Learning activities were translated into Croatian, Georgian, Italian, Portuguese, Romanian, Serbian, and Arabic (for example, [Ce părere aveau contemporanii lui Napoleon despre el și de ce ?](#)).

europeana
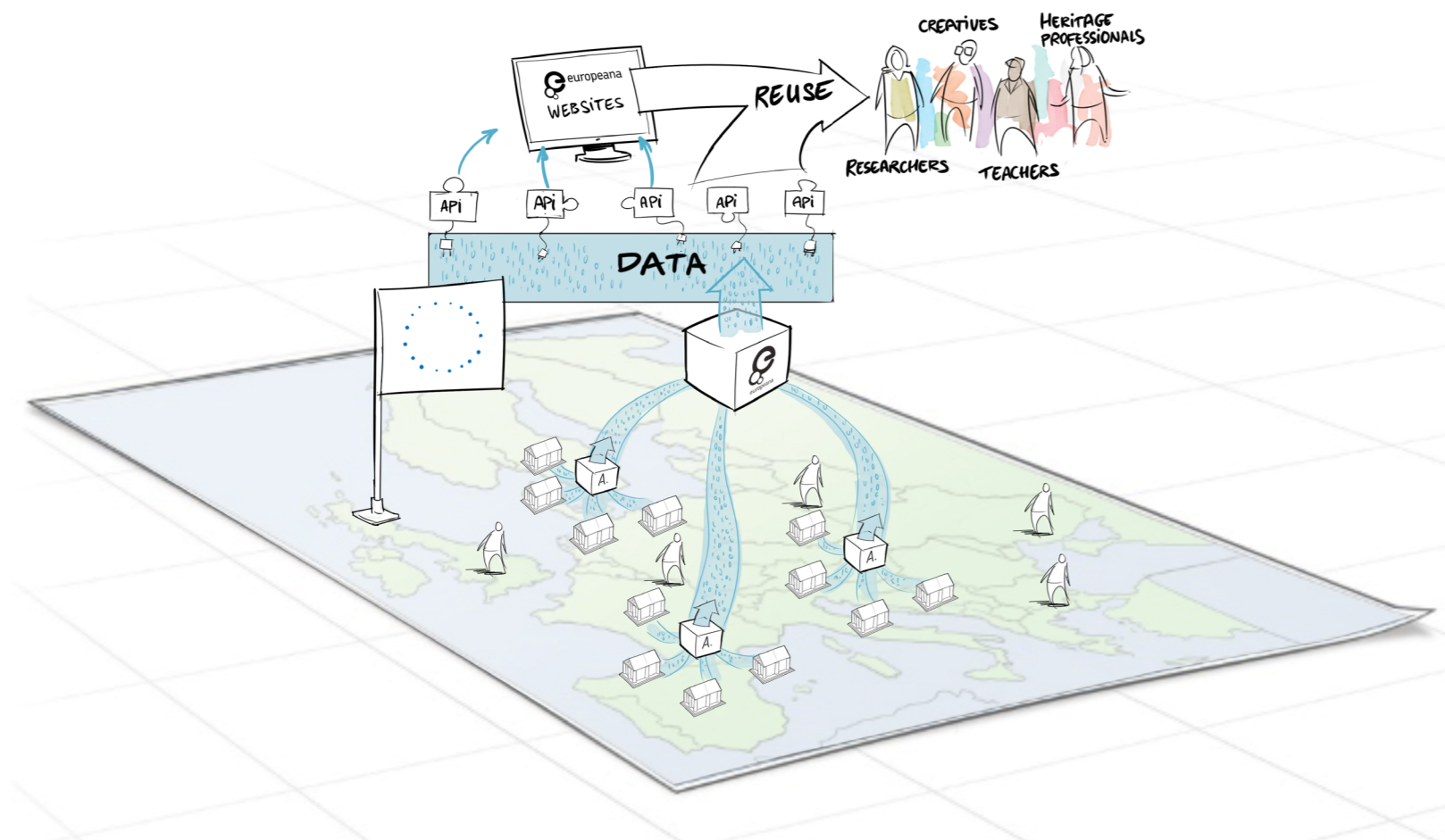
Reuse. Sketchy Business. 2023. CC-BY-SA

Engage with academic and research communities. Academic and research communities represent a large portion of those who use cultural heritage data. Relying on the new possibilities offered by the data space, we explored new ways to foster the reuse of digital cultural heritage for digitally enabled academic teaching, learning and research.

Inspired by the principles of the 'Collections as Data' worldwide movement, EF and DARIAH refined, tested, and promoted the workflow to publish Collections as Data which is based on a series of steps to curate datasets suitable for reuse with computational methods. EF co-organised a 'Collections as Data' event at the Royal Library of Belgium (Feb 2024) to bring together European national library representatives and explore the role of such institutions in the data space for cultural heritage. Prior to that, EF and DARIAH had co-organised an online training workshop on 'Collections as Data' (Feb 2024) for professionals in academia and in the cultural heritage sector. The workflow was also adopted as a tool in university teaching. At the end of Y2, it was complemented by an 'Introduction to Collections as Data' published on DARIAH Campus and designed as training material, ranging from the principles and state-of-the-art to practise and examples of implementation. The workflow and the training material will be suggested as reference material in the 'Collections as Data' pilot planned for Y3 to make available new types of data in data space for cultural heritage.

DARIAH also led on the development of three courses specifically conceived as an innovative approach to digital cultural heritage and reuse in Higher Education and Research, based on the needs and behaviours of two 'personas' (an university professor and a student), and offering: 1) an introduction to cultural heritage data; 2) an introduction to cultural heritage data modelling (with a focus on EDM); and 3) an introduction to Europeana APIs. The innovative aspects lie in the combined efforts of experts in cultural heritage data, computer science/ informatics, and Humanities teaching, and in the suggested training steps that make learners familiarise with the structure of data first in order to achieve a more conscious information retrieval from Europeana.eu and other platforms.

The courses will be promoted in Y3, while further courses will be added with the goal of developing a curriculum on digital cultural heritage, interlinking different efforts matured within European projects, and better positioning the data space towards academia and research.
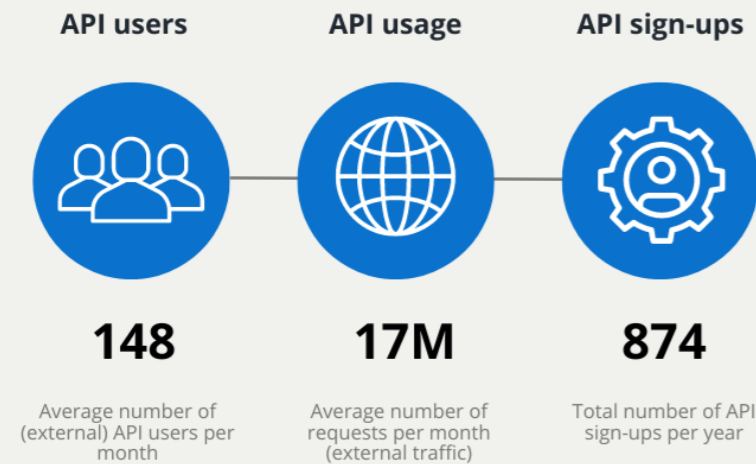
Dissemination of outcomes at events benefitted from the DARIAH's widespread network, and the DARIAH Annual Event - dedicated to workflows for reproducible research practices in 2024 - confirmed itself to be the most relevant context for the engagement with academic and research communities. Also, DARIAH supported EF in driving interest towards cultural heritage data through external platforms designed for reuse in research, prioritising the European Open Science Cloud (EOSC), which can be considered as the data space for science, research and innovation. They also co-organised a session on the data space for cultural heritage at the EOSC Symposium 2023.

Research on digital cultural heritage as an emerging university subject aimed to achieve an extensive overview of educational paths - master programmes, summer/ winter schools, or short courses across Europe - that respond to an interest in data reuse or to the need for new generations of professionals equipped with skills at pace with the digital transformation of the cultural heritage sector. The first Europeana Internship for New Professionals was designed to contribute to this research and events to foster exchanges on its topic, while also exploring how the Europeana Initiative and the data space could better support those who aim to embark on a career in the cultural heritage sector. To this aim, EF inaugurated a new event format: the New Professionals' Twin Talks. The focus of the internship also led to a look at international initiatives/ organisations that create opportunities for students and young people, an investigation that resulted in a list of 20 initiatives published on International Youth Day. EF will continue to explore the trend emerging in universities in Y3 and organise events to mature and stimulate further reflections around the topic.

EF continued supporting the Europeana Research Community, especially the working group on datasheets for digital cultural heritage hosted in collaboration with the EuropeanaTech community. The working group designed a template for datasheets, published a journal article to foster exchanges and reflections, and presented their work at several events to collect input for a more refined version of the template suitable for the data space. The community also contributed to various events (e.g. AI solutions in libraries and Operas conference 2024: Opening collaboration for community-driven scholarly communication).

Finally, EF continued to find in the GLAM Labs community a fertile ground to share experiences developed in Labs and test the 'Collections as Data' approach; among this joint efforts, there is a journal article on the checklist to publish collections as data at GLAM institutions, enriched by practical examples of implementation. By taking part in the LIBER WG on Digital Scholarship and Digital Cultural Heritage, instead, EF contributed to the design of 'Digital Scholarship & Data Science Essentials for Library Professionals', an open and collaborative curated training reference resource including a section on Collections as Data.

EUROPEANA APIS

API users	API usage	API sign-ups
148	**17M**	**874**
Average number of (external) API users per month	Average number of requests per month (external traffic)	Total number of API sign-ups per year

Usage of Europeana REST API (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

Engage with the developer communities and API customers. In Y2, the Europeana REST API (which includes Europeana's main APIs allowing users to build applications with our collections) had on average 148 users a month and almost 17 million requests per month.

In Y2, EF has developed a new API landing page where several audiences can start their user journey in learning more about our API suite and other data provision services. The landing page links to capacity building and training resources, documentation pages, demo playgrounds and FAQs. In Y2, EF also completed a major piece of work by updating all API documentation to provide a better user experience and to reflect the most recent changes to the API suite implementation. Documentation was migrated from Europeana Pro to Confluence which provides better and easier navigation following standard best practices. New FAQ pages and tutorial pages were added to support developers using our new documentation. Due to the migration to Confluence, there is now a better connection between API capacity building resources and a better integration to pages on EDM, Enrichments, and the Publishing Guide.

In tandem with improving the API documentation, we developed multiple capacity building resources for the API suite. For example, we developed a training course geared towards secondary school students giving them a first introduction to APIs, and a more in-depth course to all the Europeana APIs and the use cases they answer for wider audiences. These training courses were linked to in strategic places in the new documentation pages on Confluence. These training courses will be publicly promoted and will be used for instructor-led training once the Europeana Academy is launched. Additionally, new pages on Confluence were added to provide guidance to users depending on where they are in their user journeys (e.g. how to access the different APIs). Lastly, we published a new API FAQ to answer the most common questions users have when interacting with our data, and have migrated and updated the Libraries and Plugins page from Pro to Confluence to accurately reflect which libraries and plugins are still relevant and maintained.

The new API documentation on Confluence and the new training resources were all promoted with a promotional campaign that started in July 2024, with an accompanying news post on europeana.eu.

Finally, we promoted the Europeana API suite and capacity building resources through various events (e.g. Rotterdam University Immersive Tech Week, Nov 2023 or CREATHRIV webinar, May 2024).

Digital services for the public

The well-established Europeana website is a main product of the common European data space for cultural heritage. In Y2, we continued to optimise existing functionalities and explored additional features, with input and feedback from our audiences.

The consortium also engaged audiences with digital cultural heritage by expanding pan-European themes and perspectives, inspiring use, reuse and participation, and communicating activities to audiences.

High-performing Europeana website

The Europeana website offers pan-European content to anyone with an interest in cultural heritage. In Y2, the website received over 6 million visits and 79% of users state they are 'satisfied' or 'completely satisfied' with the website. We ensured the website is easy to access and performs well i.e. is accessible at any time and loads quickly, functions well on all devices, and is ready to take advantage of 5G infrastructure as it continues to expand across Europe.

Optimise search and browse experience. The majority of visitors come to the website to search and browse, and several improvements were made to improve their experience in the past year.

We invested significant effort in the evaluation of the existing search functionality. Most notably, we computed evaluation metrics for search effectiveness and usage, to support monitoring the

performance and the impact of changes in the search functionality. We contributed to the development of the logging infrastructure to support a more effective way of collecting the required data. Additionally, we progressed with a first Minimum Viable Product (MVP) for adding date-focused features to our search engine.

To improve the browsing experience of users on the website, EF made finding and exploring items easier and more rewarding for visitors. For example, we added view numbers for stories so that people can see how many others have read a blog post or exhibition. Additionally, we introduced a new feature to the website 'Trending items' that intends to encourage people to return to the website more frequently to see which European cultural heritage items are trending.

We released the new providing institutions page formerly known as the 'organisations page'. We enriched this page with a search feature, added the country where each institution is located, and sorting options for countries, number of items and institution names. Finally, we released an immersive storytelling experience to attract more people who are looking for entertainment. Larger, more immersive images bring the user closer to the cultural heritage items on the website. Additional fields for subtitles and descriptions allow for further keywords and Search Engine Optimisation (SEO).

Expand multilingual coverage to include all EU official languages. EF improved multilingual access to the Europeana website, recognising that different components of the website require different approaches to localisation to ensure the best possible experience for users.

Multilingual (meta) data. One line of work relates to the establishment of more multilingual (meta) data. Many metadata values that we receive have no language identification ("language tag"). In Y2, we concluded a round of experiments during which we tested various tools that can be used to detect language metadata. We integrated three of those (Google Cloud Translation, eTranslation and

EUROPEANA WEBSITE

6.01M
Visits per year

79%
% of 'satisfied' and 'completely satisfied' users

314,908
Downloads per year

38,714
User accounts

46,558
Liked records

10,236
User created galleries

Satisfaction and usage of the Europeana website (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

Tika) in our Translation API that can be used as options for language detection for multilingual display of items on the Europeana website and for multilingual search and result display on the Spanish destination of the Europeana website.

Multilingual access. The website interface and static pages are maintained in 25 European languages (the 24 official EU languages and Basque), with new features being automatically translated. To streamline the process, we implemented a phased approach to their validation. The initial stage involves internal review, focusing on a limited selection of languages before any changes go live. This allows for timely updates and the continuous rollout of new features. For transparency and to manage user expectations, we include a disclaimer on the pages that use 'auto-generated translations from English' until human review is completed. The second validation stage invites aggregators to review the live content, providing feedback and corrections within the context, which ensures better accuracy. By leveraging machine translation complemented with domain expert validation, we maintain high translation quality without delaying website development or incurring costs for professional translators.

Besides sourcing translations of editorial through the authors and professional translators, we assessed the benefits and challenges of using volunteers for machine translation validation by initiating a pilot program. Volunteer translations were collected via crowdsourcing by members of the Europeana Communicators Community. This initiative was piloted and assessed in spring-summer 2024, and will be implemented more widely in Year 3. EF also hosted two new internships with Translation Studies students, which has been very successful in improving multilingual access for those two languages (French, Italian). In total, in Year 2, over 540 individual translations were published, in all 24 official EU languages.

Optimise user interaction and participation. In Y2, we released the feature request page to get direct input from our users (account holders) about which features they would like us to develop. This feature request mechanism will make our feature prioritisation process more transparent and highlight the interest of users.

EF also promoted a more visual engaging experience for its users. We took a first step towards this by introducing a black background for all media on the item pages and moved the web resource navigation to the right hand side.

Optimise user feedback mechanism. EF improved the overall feedback mechanism to make it easier and more rewarding for users to provide feedback. In Y2, we consolidated the Jira service desk admin area, now tracking and evaluating customer feedback across four channels so that we have a better overview of the received user feedback: the Europeana and Europeana Pro websites, the info mailbox and the data space landing page. We also introduced a new feedback widget for Europeana Pro which is similar to the one on the Europeana website to make the user experience more consistent.

In Aug 2024, the average of initial response time to user feedback was 4.4h and the average of total resolution time to user feedback (excl. user feedback where the responsibility lies outside of Europeana DS consortium) was 6.4h. In Y2, we measured an excellent user satisfaction rate with our user feedback mechanism with 91% of respondents stating being 'satisfied' and 'completely satisfied' (cumulative score based on 23 scores).

Bătrân (Fundu Moldovei 1928) by Iosif Berman - 1928 - "Dimitrie Gusti" National Village Museum, Romania - CC BY-SA.

Audiences engagement with digital cultural heritage

Under this task, EF provided opportunities for the public to engage with digital cultural heritage by offering curated content and editorial in multiple languages on pan-European themes and perspectives and by (co)organising participatory campaigns.

Expand editorial and foster participation with cultural heritage. EF worked with consortium members, CHIs and other partners to produce impactful editorial connecting history and culture across borders to contemporary themes and events, such as social issues, historical anniversaries and current events.

We published editorial on themes like Black History (Oct 2023), Womens' History (Mar 2024), and LGBTQ+ history (Jun 2024). Dedicated to each theme we re-promoted editorials and published new stories (incl. guest editorials), and also aligned with posts on Europeana Pro featuring related articles.

In Aug 2024, we marked the milestone of 1,000 stories being available on the Europeana website. In total, 80 new editorials were published in Y2: 76 blogs (e.g. European Capitals of Culture 2024: Bad Ischl, Bodø and Tartu) and four exhibitions (e.g. Twin it! 3D for Europe's culture, available in 24 languages and with over 13K views, and A queer tour with over 35K views). In addition to EF, editorials were created by 32 different organisations, and individuals across Europe. Three data space supporting or generic services projects provided editorial content. Overall, users were very satisfied with the stories (blogs and exhibitions) published, with 76% on average being 'satisfied' or 'completely satisfied'. In total, exhibitions and blogs published on the Europeana website received over 1.7 million visits in the past year.

EDITORIAL ON EUROPEANA WEBSITE

Editorial refers to exhibitons and blogs published

Satisfaction with editorial	Multilingual coverage	Multilingual coverage	Visits to editorial
76%	**88%**	**8%**	**1.7M**
% of 'satisfied' and 'completely satisfied' users	% of stories published in more than one language (Y2)	% of stories published in all 24 EU languages (Y2)	Visits to stories (exhibitions and blogs)

Satisfaction, multilingual coverage, and visits to editorial on the Europeana website (Sep 2023 - Aug 2024). Europeana Foundation. August 2024. CC BY-SA

We expanded multilingual access to editorial content by increasing the amount of content that is accessible in each of 24 EU languages. In Y2, 88% of stories (blogs and exhibitions) were published in more than one language (71 stories), including 8% of stories which were published in all EU languages (6 stories). A highlight were the exhibitions curated by the European Parliament Archives, both of which are accessible in 24 languages ('Shaping Europe: the story of European Parliament elections' and 'The Hemicycle: European Democracy at Work'). Throughout the year over 500 translations have been added to newly published, as well as legacy content.

EF organised worldwide campaigns to foster digital skills and participation with cultural heritage and to teach people how to find and use open access cultural heritage data. The GIF IT UP competition (Oct 2023) encouraged participants to create new GIFs from open access digital collections, focusing this year on underrepresented communities, people and communities that historically have not been in the spotlight. As part of the competition, we organised a GIF-making workshop (114 participants) for interested potential participants. There were 98 eligible entries from 22 different countries (see winning entries).

The Digital Storytelling Festival encouraged various audiences to boost their storytelling skills and tell stories with cultural heritage. The event had 1,262 registrations (56% increase compared to 2023) with 518 participants (18% increase) and 89% of participants stating being satisfied or completely satisfied with the activity. Not only did the number of registrations and attendees increase, 87% of participants stated they were not a member of ENA (participants came from 49 countries). This highlights the power of this event, audience interest in the topic of storytelling, and the use of events in general in helping us to reach new audiences and introduce the Europeana website and the data space ecosystem to them. Our social media posts around the event generated over 980,000 impressions (compared to 155,000 in 2023).

A key part of the Digital Storytelling Festival is the Digital Storytelling Festival Online Creative Residency, where 13 participants developed stories with cultural heritage in different digital formats, this year with 3D and collage, in addition to creative writing, social media and animation. This year's theme was 'Journey' and works created by the participants were published on the Europeana website.

Together with F&F, EF continued to foster participation via Transcribathon which offers users the possibility to interact with cultural heritage by transcribing a variety of historical documents. For example, we co-organised the ongoing stories of the Month Run as well as Transcribathon events

(e.g. History In Your Hands Run set up by Dublin City University Library, Ireland). A webinar was held to introduce Europeana Transcribe to cultural heritage professionals (Jun 2024). Europeana Transcribe received an honorary mention at the first European Prize for citizen science. We also supported the technical development of the platform and maintained the connection between Transcribathon and the Europeana website.

Communicate the data space for cultural heritage activities. EF showcased and promoted inspiring examples of digital storytelling and content reuse and promoted the data space as a treasure trove of open access heritage data. We promoted high-quality open access data and editorial as well as the various functionalities of the Europeana website via social media channels, newsletters and on external platforms (most notably the account and the gallery functionality). We also promoted 3D, in support of the Twin it! campaign.

This year, we supported the editorial translation efforts with increased multilingual promotion, for example with multilingual activities on social media targeting specific language speakers and inviting them to explore translated content on the Europeana website. One success was multilingual tagging of the animated GIFs on our GIPHY, including an animated Christmas card which received almost 60 million views.

We participated in major online campaigns, such as #ColorOurCollections and #MuseumWeek, and used trending events to showcase relevant content. We continued posting on social media on a daily basis, promoting specific editorial as well as themes and a stories page as a general way to access curated content. We invited users to test their knowledge and interact with our content through participatory functionalities such as quizzes and polls and promoted events. In Y2, we introduced a new mailing list for people interested specifically in our events, updating interested subscribers about our event offer.

ENGAGEMENT ON SOCIAL MEDIA

Social media includes Facebook, Twitter (now X), Pinterest, Instagram, Medium, LinkedIn, and GIPHY

Social media reach

621.8M

Impressions on social media

Social media engagement

4M

Likes, shares, comments on social media
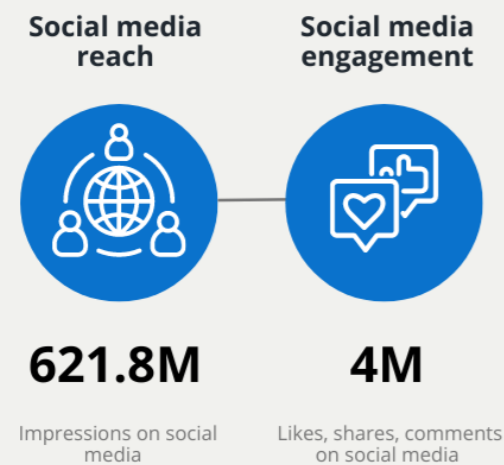
We developed new approaches to social media, to make sure we stay relevant and perform well within the fast changing social media landscape, to reinforce Europeana brand awareness, improve storytelling and take advantage of popular formats, and to collaborate with a number of institutions (e.g. DailyArt) and reusers. We currently reach audiences through various channels including: Facebook, Twitter (now X), Pinterest, Instagram, Medium, LinkedIn, and GIPHY. In Y2, we saw very high social media performance with almost 622 million impressions on social media which is an increase of 44% compared to Y1 (432 million impressions) and high engagement with over 4 million likes, shares, comments in Y2, an increase of 37% compared to Y1 (2.97 million).

[Dessin pour le concours de projet de vignette-titre] - Institut National d'Histoire de l'Art, France - Public Domain.

Data space supporting projects

In the second year of the data space deployment, four data space supporting projects started. These projects are funded under the DIGITAL-2022-CULTURAL-02 call and contribute to the data space in three main areas of work: (1) enrich the offer of high-quality datasets, tools and services in the data space; (2) use artificial intelligence and machine learning to improve user engagement and experience; and (3) foster reuse of 3D content in education, research, tourism and the wider cultural and creative sector. Below a brief overview of the currently running projects:

- '5Dculture' - Deploying and Demonstrating a 3D cultural heritage space (Jan 2023 - Dec 2024)

- 'DE-BIAS' - Detecting and cur(at)ing harmful language in cultural heritage collections (Jan 2023 - Dec 2024)

- 'EUreka3D' - European Union's REKonstructed content in 3D (Jan 2023 - Dec 2024)

- 'AI4Culture' - An AI platform for the cultural heritage data space (April 2023 - March 2025)

EF contributes to the data space supporting projects with the ingestion of content and metadata, the implementation of relevant Europeana frameworks, policy and development guidelines, the integration of tools into the Europeana website, capacity building activities and dissemination of project results.

As the projects started in the second half of Y2, it is expected that their results will be integrated into the data space by the end of 2024 and early 2025 (e.g. in Y3).

Examples of key project outcomes include:

- '5Dculture' - a Community of Practice for cultural heritage professionals - an online space that makes accessible resources for scalable reuse of 3D CH data

- 'DE-BIAS' - an AI tool that detects contentious terms in cultural heritage metadata

- 'EUreka3D' - a hub for 3D data storage and management

- 'AI4Culture' - a platform providing AI-related resources such as applications, enrichment tools, and datasets for training and validation of AI applications.

Budget and realisation

The second year as a common European data space for cultural heritage was funded for €7.5 million, and distributed amongst 19 partners (period from 1 September 2023 to 31 August 2024). The work was performed in five separate work packages:

1. Development and operation of the data space infrastructure

2. Integration of high-quality data

3. Capacity building and fostering reuse

4. Digital services for the public

5. Programme management

The balance of efforts table states foreseen and actual percentages of resources allocated to each of the five work packages and its related tasks.

Work packages & tasks	Foreseen %	Actual Aug 2024
WP 1: Development and operation of the data space infrastructure	**25.4%**	**23.7%**
Task 1.1 Provide reliable data space infrastructure and quality of services	22.7%	21.0%
Task 1.2 Foster innovation, interoperability & compliance with other data spaces	2.7%	2.7%
WP 2: Integration of high-quality data	**17.8%**	**18.2%**
Task 2.1 Develop and manage data governance mechanisms	3.6%	4.5%
Task 2.2 Data acquisition and data improvements	10.9%	10.0%
Task 2.3 Automated approaches towards data quality	3.3%	3.7%
WP 3: Capacity building and fostering reuse	**30.6%**	**30.6%**
Task 3.1 Enhance cooperation throughout the Data Space	4.4%	5.8%
Task 3.2 Identify needs of user groups	1.7%	1.4%
Task 3.3 Build awareness and engagement	6.9%	6.6%
Task 3.4 Develop capacity building as a service	3.9%	4.0%
Task 3.5 Facilitate the provision of high quality data	4.4%	4.5%
Task 3.6 Facilitating the reuse of high quality data	9.3%	8.3%
WP 4: Digital services for the public	**18.7%**	**20.0%**
Task 4.1 Deliver high-performing Europeana websites	11.8%	13.1%
Task 4.2 Engage audiences with digital cultural heritage	6.9%	7.0%
WP 5: Programme management	**7.5%**	**7.4%**
Task 5.1 Ensure continuous progress monitoring and reporting	6.0%	5.5%
Task 5.2 Governance	0.6%	0.4%
Task 5.3 Manage relations with other EU-funded projects	0.7%	1.5%
Task 5.4 Phasing-in and phasing-out periods	0.2%	0.05%
Total	**100%**	**100%**

COMMON EUROPEAN DATA SPACE FOR CULTURAL HERITAGE

Funded by
the European Union

Publications Office
of the European Union