Opening up our Heritage

Opportunities in Digitising
and Promoting Cultural and Research Collections

F. Renaville, R. Adam and C. Oger (eds.)

Presses Universitaires de Liège

Opening up our Heritage

François RENAVILLE, Renaud ADAM and Cécile OGER (eds.)

Opening up our Heritage

Opportunities in Digitising and Promoting Cultural and Research Collections

Presses Universitaires de Liège

Dans la même collection

Schnitzler Marie, Martiniello Marco et Frère Bruno (dir.), *Penser les crises ou crises de la pensée ?*, 2025.

Bédard Serge, *Notre visage. Perception et reconnaissance de soi*, 2025.

Neysen Nicolas (dir.), *Métamorphoses numériques. Explorations sur l'intelligence artificielle, le métavers, la blockchain et le marketing d'influence*, 2025.

Comblain Annick, *Bilinguisme et apprentissage précoce des langues. Entre idées reçues et fausses croyances*, 2023 (ə).

De Keyser Véronique et Blavier Adélaïde, *Faire face à l'inhumain, Autour du Docteur Denis Mukwege*, 2022.

Liebecq Brigitte et Gavray Claire (dir.), *Childless - Childfree, Fécondités, Inféconditiés, Alter-fécondités*, 2022.

Schoenen Jean, *# Migraine-Too, News et fake news sur une maladie invisible*, 2022 (ə).

Flawinne Xavier et Perelman Sergio, *La vie après 50 ans, Faits marquants révélés par l'enquête européenne SHARE*, 2021 (ə).

Zickgraf Caroline, Castillo Betancourt Tatiana, Hut Elodie (eds.), *The State of Environmental Migration 2020. A review of 2019*, 2021.

Zickgraf Caroline, Castillo Betancourt Tatiana, Hut Elodie (eds.), *The State of Environmental Migration 2019. A review of 2018*, 2020.

Kuty Olgierd, Schoenaers Frédéric, Dubois Christophe, Dethier Baptiste, *La médiation scolaire. Un regard des acteurs sur leurs pratiques* (2ᵉ éd.), 2019.

Brahy Rachel, Dumont Élisabeth, Fontaine Pierre et Ruelle Christine (dir.), *Regards sur la ville. Échanges et réflexions à partir de Liège*, 2018.

Zickgraf Caroline, Hut Elodie, Gemenne François (eds.), *The State of Environmental Migration 2018. A review of 2017*, 2018.

Aron Jacques, *Antisémitisme. Usages et mésusages du langage*, 2018.

Brahy Rachel, Dumont Élisabeth (dir.), *Dialogues sur la diversité* (2ᵉ éd.), 2018.

Gemenne François, Zickgraf Caroline, De Bruyckere Luka (eds.), *The State of Environmental Migration 2017. A review of 2016*, 2017.

Aron Jacques, *La langue allemande sous la croix gammée. Le singulier dictionnaire de Trübner*, 2017.

Gemenne François, Zickgraf Caroline, Ionesco Dina (eds.), *The State of Environmental Migration 2016. A review of 2015*, 2016.

Geenen Vincent, *Voyage[s] à travers le thymus*, 2016.

de Regoyos Jacobo, *Belgistan. Le laboratoire nationaliste*, 2014.

Pirotte Gautier et Godin Julie, *Coopération au développement. Enquête sur les Initiatives Populaires de Solidarité Internationale*, 2013.

Goossens Pierre J., *L'or à travers les âges. Une histoire pas toujours dorée*, 2013.

Kuty Olgierd, Schoenaers Frédéric, Dubois Christophe et Dethier Baptiste, *La médiation scolaire. Un regard des acteurs sur leurs pratiques*, 2012.

Contents

Part II. Structuring and Connecting Heritage Data

Part III. Promoting and Showcasing Heritage Collections

Part IV. Engaging Users and Communities

Preface

Christian Hänger

'Opening up our Heritage: Opportunities in Digitising and Promoting Cultural and Research Collections' is a compelling topic combining the evolving fields of digital technology with the preservation and promotion of cultural heritage. Heritage libraries play a vital role in maintaining our cultural and research collections for future generations. This responsibility often involves a delicate balance. While it is essential to protect these invaluable items, it is equally important to make them accessible and engaging for today's audiences, whether for education, research, or cultural enrichment.

Thanks to modern digital technologies, we now have powerful tools to bridge this gap. Digitalisation allows us to share and promote our heritage without risking damage to the original artefacts, books, or artworks. In the case of loss due to disasters of any origin, the digital versions of these materials serve as crucial backups. The new technology opens up a world of possibilities for research and education. Text recognition creates huge amounts of searchable text and allows searching for specific terms within a short time. Statistics from late-19th-century journals are now available as data and may be analysed by modern software.

This book explores how these innovative approaches open new opportunities for preserving and presenting our collective history, ensuring that it remains vibrant and accessible for generations to come. The authors are all members of an Erasmus Staff Week exchange organised by the University of Liège Library in 2024. Their papers all demonstrate the significant efforts made in generating, presenting, and disseminating digital content during the last 20 years and may be seen as best practices for digital heritage libraries. Most of the examples offer solutions for the presentation of digital objects, the dissemination of metadata, or the integration of standalone software into broader solutions. Some authors present ideas for the promotion of digitised cultural heritage and for facilitating the creation of carefully selected material packages for educational use.

The published articles may be useful for any institution publishing its cultural heritage online. Reading the outlined best practices and

projects, I found a lot of good incentives for planning and conducting the digitisation projects of the German Federal Archives. For the last 5 years, this institution has digitised up to 150 million pages. The yearly increase is now about 30 to 40 million pages. We follow two approaches: Regarding ourselves as a citizen archive, we are offering Digitisation on Demand as a service that allows users to request the digitisation of specific archival materials that have not yet been available online. In general, a maximum of 10 files per subject item is allowed. Therefore, in most cases, no fees will be charged for the reproduction of files that are not subject to legal restrictions concerning protected data. However, fees may be incurred for special requests or individual provisions.

The second approach is the systematic digitalisation of the important records from a specific era. Previous examples are the records of the revolution of 1848–1849, World War I, and the Weimar Republic. In preparation for the centennial of the year 1933, civilian and military documents of the Nazi administration will be made available online.

I hope the publication inspires and informs those involved in the stewardship of cultural and research collections, highlighting the exciting potential of digital transformation in safeguarding our shared heritage. The results of the projects presented here are encouraging and, simultaneously, reveal the need for sustained funding of the work of cultural heritage institutions.

Introduction

Renaud Adam; François Renaville; and Cécile Oger

Heritage libraries, as custodians, attach great importance to the conservation and preservation of the heritage collections in their care. Ensuring that these precious collections are passed on to future generations sometimes conflicts with the need to make them accessible and presentable to current generations, whether for teaching, education, or research purposes. Digital technologies now enable libraries and museums to enhance and promote cultural and research heritage without risking their valuable and sometimes unique books, works of art, or artefacts.

The question remains how heritage institutions, such as libraries, archives, and museums, can effectively leverage digital technologies to preserve, organise, enhance, and ensure the discoverability and long-term accessibility of their valuable collections. In today's increasingly digital landscape, merely converting analogue materials to digital formats (digitisation) is insufficient. A broader 'digital transformation' is required, encompassing structured processes (digitalisation) that enable new ways of engaging with information and fostering user interaction. Institutions must develop strong strategies to promote the dissemination of their digitised heritage to diverse audiences, as access is of utmost importance.

This book aims to investigate and define effective strategies that enable heritage institutions to fully engage in digital transformation, leveraging it as a tool to preserve, enrich, and share their cultural and scientific collections. It seeks to provide professionals and researchers in the field with insights into practices, innovative methodologies, and successful case studies that demonstrate how digital tools and infrastructures can support long-term preservation, foster public engagement, and improve access for varied user communities, including both academic and general users. This volume is structured into four thematic parts, each addressing a critical aspect of managing and leveraging digital heritage: 1) preserving and digitising cultural and scientific heritage, 2) structuring and connecting heritage data, 3) promoting and showcasing heritage collections, and 4) engaging users and communities.

The first part, focused on preservation and digitisation, examines practical considerations, institutional collaborations, and the nuanced

technicalities of safeguarding cultural and scientific materials. Nicolas Di Méo's study at the University of Strasbourg (France) underscores the synergy between librarians and academics in digitising teaching materials and artefacts. Through the use of Numistral, a shared digital repository, over 850 photographs and 20,000 projection plates were digitised, exemplifying effective collaboration despite funding and temporal constraints. Annika Peurell documents a pilot initiative at Sweden's Royal Institute of Technology (KTH) aimed at digitising research heritage. The project, aligned with KTH's digitalisation agenda (2023–2027), underscores interdepartmental collaboration and the necessity for robust infrastructural and legal frameworks. It reveals the institutional challenges faced by organisations lacking entrenched digitisation traditions. Saskia van Bergen and Maartje van den Heuvel describe their project on the collection of the Dutch photographer Frank Scholten, housed in Leiden University Libraries (The Netherlands), who documented Palestinian life between 1921 and 1923, capturing biblical sites, crafts, landscapes, and ceremonies. After Scholten died in 1942, his vast collection of roughly 14,000 negatives and 13,000 prints remained unorganised. Leiden University Libraries used AI and human effort to make the collection accessible. Image recognition matched negatives with prints, while volunteers, many with ties to Palestine, helped in cataloguing and labelling. Renaud Adam, Laurence Richelle, and Stéphanie Simon outline the University of Liège Library's efforts in Belgium to increase the visibility of its digitised heritage collections through the DONum (*Dépôt d'Objets Numérisés*) project, launched in 2009. Now hosting over 13,000 items, DONum combines preservation with open access, public engagement via blogging, and academic collaboration. It also explores the integration of DONum into ULiège's Alma system and Primo discovery solution, highlighting work on metadata, user experience, and the creation of a dedicated heritage view, *Legito*, to improve discoverability. At the Physics Department Library of the Federal University of Minas Gerais (Brazil), Gislene Rodrigues da Silva explores the preservation of historical scientific instruments. The development of a descriptive metadata model that adapts VRA Core and other standards highlights the interdisciplinary expertise required in cataloguing scientific heritage by integrating technical, historical, and conservation dimensions.

  The second part shifts the discourse to the structuring and interconnection of digital heritage data. Rouven Schabinger and Nikol Stepan introduce the Swiss Connectome project, which employs AI to

harmonise and link metadata across libraries, creating a knowledge graph to enhance discoverability through platforms such as swisscovery. Joris Colla presents ODIS, a historical civil society database in Flanders, Belgium. ODIS offers a hybrid model combining a digital encyclopaedia, research tool, and authority database. By transitioning to a triple-store database model and promoting multilingualism and open access, ODIS illustrates an advanced model of heritage data integration. Despoina Gkogkou's project, Μετάdata, addresses the fragmentation of translated literary texts in Greek periodicals (1870–1974). Employing Google Sheets and Looker Studio for indexing and visualisation, the initiative underscores challenges in data consistency, name transliteration, and source diversity. A notable case from the Paris Interuniversity Library of Health (BIU Santé) involves the Medica Ecosystem. Documented by Laurent Aucher and Olivier Ghuzel, this platform exemplifies sustainable digital library models integrating digitised texts, images, and biographical data. Medica's incorporation into Numerabilis at Université Paris Cité represents a forward-looking approach grounded in linked data and interdisciplinary outreach. Francesca Petricca examines Early European Books (EEB), a collaboration between ProQuest and European libraries. The project illustrates how commercial–academic partnerships can yield inclusive metadata practices and facilitate access to previously unindexed collections, with a particular focus on promoting underrepresented voices in publishing history.

The third section highlights methods of showcasing and promoting heritage collections. Eva Ausēja's contribution outlines the Digital Library of Latvia, which consolidates 3.8 million objects from over 650 partners. Its user-centric design and support for regional digital capacity-building serve as a replicable national model. Laura Moré's *Bertrana de Capçalera* project at the University of Girona Library (Spain) is an example of low-cost, high-impact digitisation. Leveraging existing digital resources and internal staff, the initiative revived interest in the journalistic works of Prudenci and Aurora Bertrana, filling scholarly gaps and fostering research. In Finland, Saga Jacksen analyses the Finna.fi service, which aggregates over 18 million records from libraries and museums. Curated pages such as 'Finna Classroom' and predefined content searches represent strategic methods for increasing engagement among educators and general users. Mimi Seyffert-Wirth's analysis of Stellenbosch University Library's SUNDigital Collections (South Africa) explores the metrics of digital heritage impact. She advocates for a triangulated assessment model, combining usage analytics, citation tracking, and

open metadata practices to ensure broader reach and scholarly relevance. Teresita Scalco's *Petit Tour* project at Università Iuav di Venezia (Italy) exemplifies participatory online exhibitions. With a platform fostering interactivity and inclusion, this initiative reflects a commitment to open heritage that leverages digital tools to democratise access to cultural narratives, especially those of marginalised groups.

The final section considers user engagement and participatory strategies. Marika Sarvilahti's work at Aalto University (Finland) addresses the gap in heritage awareness among students and faculty. Through information literacy integration and creative residencies, the university fosters interdisciplinary engagement with digital heritage resources. Mălina Duță's *Deported to Bărăgan* project illustrates the sociocultural relevance of oral history digitisation at Eugen Todoran Central University Library (Romania). The collection of interviews and archival records detailing deportations under Soviet influence demonstrates the ethical and historical imperative of preserving personal narratives through accessible digital means. In her chapter on the co-creation practices of Finna.fi in Finland, Riita Peltonen demonstrates how a human-centred design approach and collaboration with educators have led to the development of tools such as the 'Material Package Tool'. These tools enable content curation aligned with curricular needs, reflecting a user-oriented approach to digital service design. Finally, Junior Browne explores the digital revival of Caribbean cricket heritage at The University of the West Indies (Barbados). He emphasises the cultural significance of cricket and, through the CLR James Centre initiatives, illustrates the institutional, technical, and policy requisites for sustainable digital heritage in small states. The chapter underscores the potential for innovation and economic development through heritage digitisation.

The volume offers a panoramic view of contemporary digital heritage practices across diverse contexts. By uniting case studies rooted in technological innovation, collaborative ethos, and inclusive access models, it provides a blueprint for future heritage stewardship. Emphasis on open access, enriched metadata, and co-creation reflects a paradigm shift wherein cultural institutions transcend preservation and become active agents of public knowledge and memory production.

This book brings together the proceedings of the Erasmus Staff Training Week held at the University of Liège from 10–14 June 2024 and organised by ULiège Library. The international event, supported by the International Relations Office of the University of Liège, brought together

around 20 professionals from academic, research, and national libraries across Europe, Africa, and the Americas.

Part I

Preserving and Digitising Cultural
and Scientific Heritage

How Can Librarians and Researchers Work Together? Digitising Corpora of Photographs and Projection Plates at the University of Strasbourg

Nicolas Di Méo

The University of Strasbourg has a long history dating back to the 16th century. Its libraries and faculties hold rich heritage collections, including ancient books, herbaria, maps, projection plates, photographs, and casts. In the last quarter of the 19th century, following the defeat of France by Prussia in 1870 and the annexation of the Alsace region by the newly created German Empire, the university was refounded as Kaiser-Wilhelms-Universität, becoming one of the most modern academic institutions in Europe. German authorities wanted to promote scientific knowledge, both to show German excellence and to foster the development of the region, thus rendering the annexation acceptable among the local population. Significant sums of money were invested in the development of the university, allowing the construction of brand-new buildings, the hiring of renowned academics, and the purchase of vast collections of books and objects for teaching and research purposes. Rich teaching apparatuses – *Lehrapparäte* in German – were, therefore, constituted during the German period (1871–1919) but also after the return of Alsace to France at the end of the First World War. French authorities were eager to emulate their German counterparts to prevent any form of nostalgia (Bischoff & Kleinschmager, 2010).[1]

Although some have disappeared, many of the items acquired at the time have been preserved to date and constitute the core of the university's heritage collections. With a few exceptions, ancient books are well accounted for and kept in adapted library storage rooms. Other objects, however, usually remain the faculty's responsibility. Their storage conditions are unequal: some of them have been included in restoration projects and are now well-preserved, such as the corpus of geographical projection plates entrusted to the local public archives (the *Archives d'Alsace*). However, other objects are still kept in damp and dusty premises, often without proper inventories. Nevertheless, increasing numbers of researchers are aware of the scientific interest of these

1. For more information on the history of the Alsace region, see Wahl (2015).

heritage documents that give an insight into how people taught and conducted their research in the past.

Until the beginning of the 21st century, historical works on education, teaching, and research mostly focused on the political or sociological dimensions of the subject. Teachers' and researchers' professional practices were deemed less important and scarcely taken into account, at least in France. Only recently, in the last 15 to 20 years, have such practices started to be closely scrutinised. Both librarians and researchers have rediscovered numerous objects collected in the attics and basements of universities, such as illustrated teaching boards, projection plates, and ancient ceramics (Lagrange, 2017; Bouteloup, 2023). This new wave of interest has been fostered by the development of digital humanities, which has allowed bringing this heritage to a wider audience. In Alsace, the region's history has, on occasion, led to a special emphasis on comparative approaches underlying the differences and similarities between French and German pedagogical techniques.[2]

In this context, since the middle of the 2010s, the Strasbourg University Libraries have conducted several digitisation projects, some of them in close connection with local research teams. In the coming pages, we will present two of these projects (one involving a corpus of photographs and another one involving a corpus of glass projection plates), focusing more specifically on how librarians and researchers have collaborated on them.

The digital repository in which these heritage documents are visible today is called Numistral,[3] and it is common to three higher education institutions (the National and University Library; the University of Strasbourg; and the Université de Haute-Alsace, located in Mulhouse and Colmar) and one public library (The Mulhouse Municipal Library). The first digital heritage repository was created at the University of

2. For instance, the *Revue de la BNU*, published by the *Bibliothèque nationale et universitaire*, located in Strasbourg, will address this question – among others – in its Fall 2025 issue entitled *Ces obscurs objets du savoir: le patrimoine de l'enseignement et de la recherche, étude, mise en valeur, redécouverte*.

3. https://numistral.fr/fr. Numistral is composed of four databases than can be interrogated by a single search engine. This search engine was developed by the French National Library (BnF) as part of its 'Gallica marque blanche' programme. For its own database, the University of Strasbourg uses ContentDM, a software solution developed by OCLC.

Strasbourg in 2006; in 2019, it became a member of Numistral under the guidance of the French Ministry of Higher Education and Research, which encourages universities and other higher education institutions to develop common services. Initially, the University of Strasbourg's digitisation policy focused on ancient books requested by readers or selected by librarians. Gradually, however, a new approach was adopted: librarians and researchers started working together to constitute wider corpora of documents related to specific topics or disciplines, such as archaeology, history of art, or numismatics. Some of these projects benefitted from special funding by the university, which was keen to promote its past and heritage. The collaboration between libraries and research teams was an evident asset in obtaining these funds.

The Digitisation and Scientific Enrichment of Classical Archaeology Photographs

The University of Strasbourg has a rich collection of more than 12,000 archaeology photographs dating back to the second half of the 19th and the beginning of the 20th centuries. This corpus is part of a wider *Lehrapparat* constituted by Adolf Michaelis (1835–1910), who was appointed as the first classical archaeology professor at the newly created Kaiser-Wilhelms-Universität in 1873, and his successors. During his tenure, Michaelis was granted substantial sums of money that allowed him to buy not only photographs but also projection plates, books, pottery, and other objects, including a series of plaster casts reproducing Greek and Roman sculpture masterpieces. Purchases of this kind were not uncommon at the time, but the Strasbourg collection is particularly rich and well-preserved and constitutes the core of the Adolf Michaelis Museum located in the main historical building of the university, the *Palais Universitaire*. The photographs, furthermore, are not especially unique, since they were bought from photographers who produced and sold complete series to universities for teaching and research purposes. However, when the digitisation project started in 2014, it appeared that many of them were not present in other digital libraries and, therefore, were unavailable to a large audience, having often been lost or destroyed over time. Working in close collaboration, librarians and researchers selected 854 items that were digitised by the University Libraries' digitisation workshop.[4] According to researchers, these documents

---

4. https://numistral.fr/fr/photographies-darcheologie-classique

provide interesting information on the history of famous archaeological sites such as Delphi, Corinth, and Pompeii. They show what the sites looked like at different periods and how they evolved. Some of them even have a kind of artistic dimension, such as the view of the aqueduct of Claudius in Rome reproduced with a woman wandering among the ruins (Figure 1). This blend of artistic and scientific value was important in the selection of the corpus.

Figure 1 – Aqueduct of Claudius (Rome, Italy) https://docnum.unistra.fr/digital/collection/coll4/id/475/rec/3.

The goal of the project was not only to bring little-known documents to the attention of researchers but also to make these documents accessible to non-specialists. To do so, digitisation was only a first step. Owing to funding from the Ministry of Research and Higher Education and the university itself, we were able to hire young researchers – master's or doctoral students – and ask them to describe the pictures as precisely as possible. This scientific enrichment took the form of short explanatory texts added to the Dublin Core records of the digital documents (records that were originally created by librarians). Among many other examples is a view of the Acropolis in Athens printed in 1881 but first captured

by the photographer Paul Baron des Granges around 1860 (Figure 2).[5] The Acropolis is markedly different from what we know today, not only because modern buildings are scarcer but also because the aspect of the ruins themselves has changed. As the short text enriching the record states, the Frankish Tower (*Tour franque*) and parts of the wall surrounding the site were destroyed a few years after the picture was taken. This information confirms the dating of the photograph while providing useful indications on how the site was excavated and developed over the last 150 years. Mediaeval remnants such as the Frankish tower were erased in the 1870s to restore the Acropolis in its antique aspect.

Figure 2 – Acropolis in Athens https://docnum.unistra.fr/digital/collection/coll4/id/223/rec/3.

The same can be said of many other photographs, such as those depicting the Temple of Apollo in Delphi, which represent the ruins as

5. For more information on Paul Baron des Granges: https://wiki.scd.unistra.fr/z_externe/valorisation/photographes/granges_baron_paul_des.

they could be seen around 1910.[6] The current state of the monument is considerably different: six columns have been reerected on one of its sides, which shows the progress of restoration work over time. On the contrary, other monuments do not seem to have changed significantly, such as the Temple of Pallas in Corinth (Figure 3). However, the steps leading to the remains of the peristyle have been excavated or rebuilt since the picture was taken 150 years ago.

Figure 3 – Temple of Pallas in Corinth https://docnum.unistra.fr/digital/collection/coll4/id/691/rec/1.

In some cases, pieces of information are missing: sometimes, the photographer remains unidentified, whereas in other instances, the date of the cliché cannot be determined for sure. Nevertheless, even when data are incomplete or uncertain, the pictures provide valuable insights into the history of the sites. The next step will be to make greater use of these documents by uploading them on Wikimedia Commons and using

6. https://docnum.unistra.fr/digital/collection/coll4/search/searchterm/delphes

them to enrich existing Wikipedia pages. This step will be completed by the end of 2025.

The collaboration between researchers and librarians has proved fruitful for several reasons, the deployment of complementary skills being one of them. Librarians have not only digitised documents but also created corresponding metadata. Researchers have helped them determine which metadata are relevant and given them bibliographical advice. Researchers have also recruited competent master's and doctoral students to enrich records. Both librarians and researchers shared a common conception of open access: one of the main goals of the project was to present this little-known research material to the scientific community and the general public. However, the project has had some shortcomings. First, the funding was insufficient to finish the project: though all the pictures have been catalogued, not all of them have been scientifically enriched. The young researchers employed for the task signed temporary contracts that were too short to allow them to finish the job, and the senior researchers did not have time to take over. Although the faculty of history supported the project, it was never considered a top priority, such that personal relationships between librarians and researchers were paramount to moving the work forward. When one of the researchers involved left the university to pursue a career at another institution, it became very challenging to continue at the same pace. Finally, the online distribution of other materials, such as the rich collection of archaeology glass plates held by the faculty, did not take place. The lack of financial means played a part in this situation, but this issue was also because the projection plates had begun to be valorised through other channels, namely by a professional photographer working for the faculty as a permanent employee. In this context, overcoming a feeling of competition between the two projects proved more difficult than expected. Nevertheless, despite these reservations, the work accomplished remains highly satisfactory.

The Digitisation of Art History Projection Plates

The University of Strasbourg has a collection of 20,000 projection plates purchased between 1890 and 1940, both by the German professors of the Kaiser-Wilhelms-Universität and by their French successors. Most of these documents are not unique since they belong to series produced by specialised firms which sold them to universities and other higher education institutions. However, like the archaeology photographs, the

University of Strasbourg's art history glass plates collection is probably one of the richest in France, if not the richest, thanks to the vast sums of money devoted to the constitution of *Lehrapparäte* during the German period.

The digitisation of this corpus was a much larger project than the previous one. It took almost two years, between 2019 and 2021. The COVID-19 pandemic and the successive lockdowns in France at the time slowed the pace, but two employees of the University Libraries' digitisation workshop devoted most of their time to the project. The result is also available on Numistral.[7] The idea of digitising this collection came from two researchers who had worked on the subject. At the outset, there was some deliberation between two strategies, namely whether to digitise the entire collection or to focus solely on a selection of plates. Many documents are reproductions of masterpieces that are well-known and well-documented elsewhere, even if some pictures show them in states that are not necessarily their current ones, especially when they have undergone restoration work since the photographs were taken. Digitising only the rarest items, such as views of local buildings that do not exist anymore or have been altered over time, could have been a solution. However, the researchers argued that the digitisation of the whole collection would allow them to better understand how their predecessors taught art history; which works seemed paramount to them; and which place each specific form of expression – painting, sculpture, and architecture – occupied in their teachings. Moreover, the comparison between projection plates and various documents, such as course programmes, could provide highly useful information.

Thus, the decision was finally taken to digitise all the 20,000 glass plates. Because of the number of documents, librarians only created basic metadata far less developed than for the archaeology photographs, and researchers asked master's students studying art history to complete them. The University Libraries were able to finance two internships, but the other students who worked on the corpus did it as part of the courses they were taking, as their teachers considered the project to be an opportunity to train them in the identification and description of iconographic documents. This pedagogical aspect of the project was quite important and proved successful.

7. https://numistral.fr/fr/plaques-de-projection-de-linstitut-dhistoire-de-lart

Digitisation was accompanied by an improvement in conservation conditions. Before 2019, art history projection plates were stored in a damp and dusty basement in worn-out boxes. The funding provided by the university allowed us to clean them, buy new boxes and pH-neutral paper envelopes, and move them into correct storage rooms. Moreover, the researchers involved organised a conference on the topic of projection plates and published its proceedings (Borlée & Doucet, 2019). Digitisation, therefore, happened alongside scientific and pedagogical achievements.

In this case as well, however, some shortcomings exist. Despite the commitment of researchers and their students, only 3,000 records have been enriched so far. Most items still only include the basic metadata (i.e. title, author, inventory number) originally created by librarians. Once again, the sums of money allocated by the university were relatively generous, especially in the context of controlling or reducing public spending, but they were insufficient to finish the project. The collection of projection plates is now available to the public, which is noteworthy, but not in the way it was imagined at the beginning of the project. Specialists can find interesting pieces of information when consulting them, but non-specialists likely feel slightly lost in this vast quantity of documents.

Conclusion

Based on the experiences described above, it is important to emphasise four key points essential for the success of digitisation projects based on the collaboration between librarians and researchers. The first one is the notion of complementarity, both in terms of competencies and expectations. It may seem obvious, but researchers will not be implicated if digitisation is not useful to their teaching and/or scientific activities. This remark means that corpora, metadata, and other elements must be determined collaboratively. The second point concerns the existence of a common vision of open access: in Strasbourg, for instance, other digitisation projects failed after researchers refused to disseminate primary sources on which they were working, such as corpora of photographs and projection plates, because they wanted to retain a form of exclusivity on these documents, even though this position was contrary to the university's open-access policy. The third point is the question of temporality. Researchers' and librarians' temporalities may easily differ; researchers, who need to publish on several topics to

advance in their careers, may move to other subjects before the projects they initiated are completed. The third point leads to the fourth one. The selection of 'reasonable' corpora is essential. Projects must not be too long because funding may be generous in the beginning but may also rapidly disappear.[8] The French context is likely not an exception: the development of project logic in the last 20 years makes it relatively easy to initiate new actions and considerably difficult, if not impossible, to extend them over the long term.

References

Bischoff, G., & Kleinschmager, R. (2010). *L'Université de Strasbourg – Cinq siècles d'enseignement et de recherche*. La Nuée Bleue.

Borlée, D., & Doucet, H. (Eds.). (2019). *La plaque photographique: un outil pour la fabrication et la diffusion des savoirs (XIXe-XXe siècle)*. Presses Universitaires de Strasbourg.

Bouteloup, M. (2023). *L'antiquarium du Musée Adolf Michaelis à Strasbourg : la céramique*. [Doctoral dissertation. Université de Strasbourg]. https://theses.fr/2023STRAG018

Lagrange, M. (Ed.). (2017). *Université et histoire de l'art : objets de mémoire, 1870-1970*. Presses Universitaires de Rennes.

Wahl, A. (2015). *Une nouvelle histoire de l'Alsace contemporaine*. Éditions du Belvédère.

---

8. Several examples can be cited. A decade ago, for instance, I participated in a programme originally aimed at digitising, summarising, and indexing the 3,000 or so press articles written by French novelist François Mauriac between 1905 and 1970, until his death. This project was funded by the Aquitaine region and the Université Bordeaux Montaigne, as Mauriac spent his childhood and youth in and around Bordeaux. Although the sums allocated to the project were not negligible, they proved insufficient to complete the task. Eventually, the decision was made to limit the project to the period between 1905 and 1945, during which almost 1,000 articles were written. For more information on this specific project, see: https://mauriac-en-ligne.huma-num.fr/about.

Abstract

In recent years, Strasbourg University Libraries have digitised thousands of heritage documents bought by academics and services between 1880 and 1940 both for teaching and research purposes. Among them, two specific corpuses have been gathered within the framework of a close cooperation between librarians and researchers: the first one is composed of 854 archaeology photographs dating back from the end of the 19th and the beginning of the 20th centuries. The second one is composed of roughly 20,000 art history glass projection plates from the same period. This paper discusses what proved effective and what did not, highlighting the challenges encountered and the solutions applied. Librarians' and researchers' expectations are not necessarily the same; their temporalities may also differ; yet common grounds can be found in order to preserve and reinterpret heritage collections.

Keywords

Material Digitisation of Scientific Publications at KTH – Planning for a Pilot Study

Annika Peurell

Digitisation and Digitalisation

Today, 'digital' and 'digitalisation' are commonly used terms that appear in many contexts with varying meanings. At Sweden's Royal Institute of Technology (*Kungliga Tekniska högskolan* – KTH), as well as in society at large, the concept of digitisation is widely used for business development through digital working methods and technical solutions, enabling people to do entirely new things or the same things in entirely new ways.

The term is also used when analogue information resources are converted into a digital format and made accessible. This transformation involves several stages: digitisation (the conversion), digitalisation (the process), and digital transformation (the effect).

Libraries and archives have traditionally used digital technology primarily for managing, creating, and providing access to information about their collections (metadata) but, for various reasons, have rarely been able to convert the printed collections into digital formats. Nevertheless, the expectations for digital and open access to information resources and sources, both past and present, are steadily increasing. Efforts toward advancement are being made both within the sector and by vendors and other companies, such as Google Books. An example in Sweden for cooperation and progress is the Swedish National Library's collaborative project Det Svenska Trycket (DST)[1], a 2020 initiative for digitally accessible printed production.

The Technological Institute, KTH, and its Publishing

KTH, today the largest institution in Sweden for technical education and research, has grown to become an international leading technical university. The origin started almost 200 years ago, with the need for technically knowledgeable persons for the growing Swedish industrial

---

1. https://www.ub.lu.se/en/about-lund-university-library/projects/digitising-swedish-printed-material?q=about/projects/digitizing-swedish-printed-material

sector. It triggered the Technological Institute's activity in central Stockholm in 1827, following a government order issued in 1825. The bylaws stated that the teaching should be 'more popular and practical than scientific.' The Technological Institute's first director was Gustaf Magnus Schwartz (1783–1858), a professor of physics at the Royal Academy of Sciences. In the 1846 reorganisation, the institute was given a focus more comparable to that of an engineering education. The institute had, at the time, three professors. On the 50th anniversary, in 1877, the government changed the name of the institute to the Royal Institute of Technology, KTH. In the new bylaws of that year, KTH was organised into professional schools.

In 1911, a parliamentary decision laid the groundwork for a substantial enlargement of KTH. New school buildings and laboratories were built, and a campus was established in Stockholm. New chairs were added, and by 1926, KTH had 34 professors and 130 other teachers. Moreover, in 1927, KTH was given the right to award doctoral degrees.

KTH, like all other higher education institutions, has a long tradition of publishing research results, operational reports, theses, monographs, periodicals, and lists, from the first publication in 1837 by its director (Schwartz, 1837).

Increased publishing activity was noticeable in the 1920s and onwards due to the investment in the expansion and growth of KTH. Moreover, more researchers published their texts in languages other than Swedish and, therefore, found ways to reach out internationally. When the university's own writing series started in 1947, it further increased publishing in a somewhat broad range of research output. Since 1971, efforts have been made to curb and organise the releases, for example, into many Transactions of the Royal Institute of Technology + A (TRITA) series.

Since 2011, all of KTH's publications have been digitally published in DiVA,[2] an institutional repository for research publications and student theses written at 50 universities and research institutes in Sweden. Earlier publications can be found there as well, and some digitised material has been added, such as Schwartz's publication from 1837. But the vast majority of KTH:s early publishing is still in an analogue form.

---

2. https://www.diva-portal.org/

The early KTH research results are still relevant and an in-demand knowledge asset. However, unlike many other higher education institutions, KTH has no established tradition of digitising analogue publications. Access to older KTH material depends primarily on the remaining analogue copies, and the coverage is somewhat uncertain and scattered. Theses and other research publications are relatively well represented in the KTH library, where they are available for loan or on-site reading. Some printed KTH materials can be found in the archive or at the schools at KTH or, in the worst case, not at all, requiring external searches.

Efforts have been made over the years to provide an updated overview, a task that KTH would need to continue to prioritise with increasing urgency. The Swedish legislation on legal deposit copies covers almost all published documents in Sweden since 1661, so there is a reasonable chance that missing material could be recovered at the Royal Library (*Kungliga Biblioteket*) or other research libraries.

Digitalisation at KTH

Digitisation of previous research results or other relevant analogue information is not always included in the strategies for the digital transformation of organisations. It may be a part of the efforts, but digitisation of analogue information materials needs to be specifically emphasised to be recognised as a relevant resource and requirement for a strong and effective research infrastructure. The focus of an upcoming pilot study will be the need of transformation of printed materials into digital formats. To ensure clarity at KTH, the pilot study will address the concept of digitisation as material digitisation.

At KTH, digitisation is one of the four pillars of the institution's activities, together with sustainability, gender equality, and internationalisation. The vision for a digitalised KTH is as follows: 'A digitised KTH secures creativity, accessibility, and utility for education and research' (KTH, 2022). The strategy includes several strategic goals with associated subsidiary goals.

One of the subsidiary goals (2.4.2) focuses on ensuring and implementing the management of KTH's knowledge assets and will be relevant to the pilot study. This goal is as follows:

The sub-goal is based on the existence of several pilot initiatives and cross-functional collaborations that need to be scaled up and implemented widely to achieve full impact. Developing a common solution for interconnected and interoperable digital research infrastructure presents KTH with a series of decisions regarding strategic direction and funding models for the management, use, and sharing of research data. Investments in digital research infrastructure can also better highlight KTH's research achievements and create better conditions for KTH's research results, projects, and knowledge assets (publications, data, code, etc.) to make an impact on society.

Preservation of KTH Collections

Parallel to the possibilities offered by digital accessibility and its many opportunities, another significant reason for the material digitisation of KTH's older scientific publications is the secure preservation of KTH's accumulated knowledge heritage. For KTH to provide digital access to and present research results, now and in the future, the conditions for a comprehensive material digitisation project need to be explored.

Digitisation Project – Pilot and Proposal

To ensure that KTH can provide access to and ensure the preservation of its published research throughout the entire period of its practice, the KTH Library has proposed a material digitisation project. This project is not only a relevant task to support research infrastructure but also a suitable goal to reach for KTH's 200th anniversary in 2027.

A pilot study was planned to be conducted in 2024 to investigate and summarise the conditions and provide a cost estimate for requesting additional funds for this project (digitisation and additional salary funds for associated efforts). The time required for the pilot study was estimated to be three to four months full-time. A prioritised first step was, as mentioned earlier, to summarise an updated inventory and overview of analogue access to KTH's earlier publications.

Digitisation can be done in many ways. It is a task that requires collaboration between several different competencies, including the library; archive (inventory, selection of supplier, handling, selection, packing, unpacking, file review, cataloguing); information technology (IT; format selection, storage, and access); and legal (clearing any copyright

issues and procurement) departments. Digitisation can provide rewarding exchanges and build competencies for all parties, but a clear goal, communication, structure, and coordination are relevant success factors. Extra resources are usually required, especially in the project's final phase, including reviewing, cataloguing, and providing access after the conversion effort. Furthermore, allocated time for designated persons in the library, archive, IT, and legal departments is needed to provide support and answer questions related to the feasibility study.

In Sweden, the GLAM sector has jointly and nationally worked on overarching priorities and strategies for digitisation work with checklists and support documents that should be followed. A common starting point has been the digital collaboration platform Digisam's 14 guiding principles regarding the areas of governance, production, use, and preservation (Digisam, 2014). Digisam is no longer an active platform, but the principles are still valid.

Several crucial decisions should be made before a digitisation process can begin.

- What should be digitised? (selection of material)
- Why? (purpose)
- For whom? (stakeholders)
- How? (methods/hardware/software)
- Where? (in-house or external performer)
- When? (timeline)

The first four questions are about strategic choices, whereas the latter three concern practical considerations in connection with the actual implementation.

A preliminary consideration is whether digitisation needs to take place partially on-site at KTH (due to the condition of the material) or if everything can be done by an external service provider. A procurement may need to be carried out, but the digitisation centre of the National Archives in Fränsta is a national resource for authorities in Sweden and can be used if preferred.

Digital ordering competence is needed in the project to design precise requirements specifications with the knowledge of software and technology, file formatting, sizing, and metadata. There is much to learn from other successful projects (including mistakes to learn from and avoid) with summarised recommendations to adapt to the particular

conditions the project will face. A prerequisite for the material to be usable is – in addition to open formats and qualitative metadata – clear licensing.

Each digitisation project must handle the issue of secure and long-term storage. Today, we are well aware of the value of digital material but also that digitisation is expensive and resource-intensive. Therefore, it is important to plan for long-term and secure storage so that the digital resources can be used and reused. This process requires high-quality materials and metadata, sustainable formats, and secure systems for the storage of our knowledge assets, as noted in the KTH Digitalisation Strategy 2023–2027's sub-goals.

Conclusion

Material digitisation is not an end in itself, and it is always crucial for each digitisation effort to have a clear purpose and goal, maintain high quality, and plan for broad use and long-term storage. Ensuring well-kept and openly accessible research and metadata from KTH, past and present, through a digitisation project should be seen as a valuable long-term investment, aligning with the demand for increased digitalisation and development.

References

Digisam. (2014). *Vägledande principer för arbetet med digitalt kulturarv*. https://www.diva-portal.org/smash/get/diva2:1773287/ FULLTEXT01.pdf

KTH. (2022). *Strategy for KTH's digitalisation during the period 2023–2027* (No. V-2022-0710). https://www.kth.se/polopoly_fs/ 1.1323634.1710235497!/Strategy-for-KTHs-digitalisation-during-the-period-2023-2027.pdf

Schwartz, G. M. (1837). *Beskrifning på en ny linberednings-machin, uppå hvilken linet kan, med ens, både bråkas, skäktas och borstas*. Carl Deleen. https://kth.diva-portal.org/smash/get/diva2:344773/ FULLTEXT01.pdf

Abstract

The Royal Institute of Technology, KTH, recognises the relevance of its early research results but lacks a tradition of digitising analogue publications, leading to scattered access, primarily through physical copies. While the KTH library holds the most recent theses and research publications, older materials may be incomplete or require external searches.

To address these gaps, the KTH Library is planning for a material digitisation project, aligning with its Digitalisation Strategy (2023–2027), which emphasises creativity, accessibility, and effective management of knowledge assets. A pilot study will evaluate conditions for digitising printed materials, with an initial focus on updating the inventory of analogue publications.

Successful digitisation will require collaboration across libraries, archives, IT, and legal departments. Key decisions will involve selecting materials, defining purposes, identifying stakeholders, and determining logistics. The project will adhere to the guiding principles established by Digisam, emphasising governance, production, and preservation.

Ultimately, the project aims not only to digitise but also to ensure high-quality, accessible research outputs, thereby preserving KTH's knowledge heritage for future generations. This initiative is highly relevant for enhancing KTH's research impact and aligns with the broader demand for increased digitalisation.

Keywords

The Digitisation of the Frank Scholten Collection at the Special Collections of Leiden University Libraries

Combining Innovative Digital Technologies and Physical Action in a Spatial Setting for Increased Findability of a Large Photo Collection

Maartje van den Heuvel and Saskia van Bergen

Photography is becoming increasingly important as a visual resource for research and education. Visual literacy has taught individuals to be critical of the alleged documentary value of a photograph. To interpret photographic imagery effectively, one must first clearly understand the collection and provide accurate initial information about it. Sorting and adding basic information to a photographic collection so that it becomes accessible and its rich content can come alive in the minds of researchers, students, writers, and image editors is a profession in itself. In a time when the combination of AI with photography is still perceived with suspicion, often in the framework of copyrights and authorship, we would like to present a case in which AI and, especially, image recognition are brought into action positively. Due to the large number of images involved, the work described in this article could not have been realised by a single or few persons in real life without such collaboration.[1]

When the Frank Scholten (1881–1942) collection was transferred from The Netherlands Institute for the Near East (NINO) to Leiden University Libraries, the library was confronted with a huge photography collection of ca. 14,000 negatives; 13,000 photographic prints; 65 albums with photographs; and postcards, cut-outs, and other archival materials. The collection was unsorted, uncatalogued, and, because of the vulnerability of the photographic materials, unavailable to the public. Although the contents were of enormous academic importance, the size and disorder

---

1. For more AI practices in the field of visual arts, see Wasielewski (2023) and Stork (2024).

of the collection made it impossible for the standard number of staff to handle. Finally, the collection was physically sorted and made digitally accessible through a fruitful combination of AI technology and human physical labour in the form of workshops with groups of volunteers. This innovative combination had to be developed on the spot.[2]

The Palestinian Years of Frank Scholten

Frank Scholten was the son of a wealthy Amsterdam family.[3] He studied art in Berlin from 1908 until the First World War, when he was forced to return to his hometown. Originally from a Protestant background, his rebellious spirit came to the surface when he converted to Catholicism. This conversion was a true statement in a society where religious segregation was complete. He was also not afraid to show his queer lifestyle in an era dominated by moral standards that included traditional values of family life, which led to him being arrested by the police for behaviour that was considered immoral at the time. Perhaps in search of more freedom outside this restrictive environment, but also to find the landscapes and environments of the Bible, which had become a true passion for him since his conversion, Scholten sailed to the Holy Land of Palestine in 1921 (Figure 1). Frank Scholten had taken up photography

2. We would like to thank everyone who has helped to unlock this collection: Sary Zananiri and Karène Sanchez with their expertise; Willemijn Havenaar and Lara van der Hammen who initially catalogued the collection; Abishek Dutta and Giles Bergel of the Visual Geometry Group, Oxford University, for the tool they built for us using Image Recognition; Picturae and especially project manager Frank Pera; Sander Müskens who coordinated and accompanied the volunteer workshops; Rama Mwinyimbegu for making the collection better searchable with AI; and all the volunteers who realized the sorting with dedication and patience: Melissa Allieri, N.A.I. Aulia Izza, S.R.L. Berntsen, R.N. de Bruijne, B.V. Burgess, Salome Erni, Peter Groenewegen, Vera van Heel, Salma Helmi, Lieks Hettinga, Annetje Huizinga, Marijke de Jong, Kenzy Kamel, Mariëtte Keuken, Timur Khan, Jochem Kleinjan, Gerrit van der Kooij, Bert van Loen, Lia Lyutakova, Sander Müskens, Anna Navumchyk, José Oudejans, Kate Pukhovaia, Nama'a Qudah, Basema Salman-Spijkerman, Mara Elif Schön, Ingrid Schroeder, Pauline Seijffert, Iris de Smalen, Rene Spitz, Christel Stapel-Saridjo, Niko Tetteroo, Tsjikke Vlasmat, Bart Wagemakers, M.C. Walraven, Erno Wientjens, Niek Winters, Alberto Zarraga, and Jowan Zonneveld.
3. For articles on the scope and importance of Scholten's photography, see Kwiecien (2008) and Zananiri (2021).

by then. His artistic interests and training as a visual artist in Berlin, combined with the mindset of a true collector, led him to make, collect and categorise images almost obsessively.

Figure 1 – Frank Scholten in Palestine, photographing himself with his camera among other people in a mirroring window, Palestine (exact location unknown) 1921-1923.

Scholten's initial aim was to create an illustrated Bible based on his journey. He annotated photographs of biblical sites and scenes that reminded him of biblical passages or characters with references to specific biblical quotations. Scholten made these annotations on the back of the photographic prints, on the envelopes in which he packed his negatives, or on the pages of the photo albums that he created. However, he was so fascinated by everything he experienced and saw that he ended up photographing and 'visually collecting' virtually everything, including professions, crafts, landscapes, agricultural methods, folk costumes, and festive ceremonies of Jews, Christians, and Muslims. In addition to his own photographs, his accompanying archives contain countless photographs taken by other photographers or commercial photo studios, postcards, cuttings from books and magazines, and other visual material of images and phenomena Scholten found interesting. His

efforts could be described as encyclopaedic, although during his lifetime he was only able to begin to sort and categorise the material.

The History of the Collection: From Oblivion to Renewed Interest

Because of his friendship with Professor Liagre Böhl, who was one of the directors of NINO, Scholten bequeathed his photographic archive and documentation to this research institute upon his untimely death in 1942.[4] Apart from a few hundred photographs that Frank Scholten used for his book *La Palestine illustrée* (1929; later editions in German [1930], English [1931], and Dutch [1935]), most of the photographs were unknown to the public, and the collection hibernated for more than six decades.

The international project Crossroads (running from 2017–2022) initiated by Leiden University, studied the interrelated history of the Arab–Christian communities in Palestine during the formative years of the Middle East (1920–1950).[5] Frank Scholten's photographs were an important source for the project, as they visualised the region during the fascinating years from 1921 to 1923 when the Ottoman rule was slowly giving way to other influences, marked by social changes and many groups from different religious and cultural backgrounds migrating in and out of the country.

Frank Scholten had a broad interest in and access to all kinds of social circles. Of all the photographers who entered Palestine at that time, Frank Scholten's collection is the least likely to show a political (colonial) agenda. The area is constantly the focus of religious and cultural groups who see it as their roots and homeland, as the current war shows. The photographs give an insight into many places and the way people relate to them in many instrumental, cultural, and religious customs and ceremonies.

4. For a history of the collection, see the Collection description on collectionguides.universiteitleiden.nl, https://collectionguides.universiteitleiden.nl/resources/ubl674.

5. https://crossroadsproject.net/. For publications resulting from this project see e.g. Sanchez Summerer and Zananiri (2021).

Unlocking the Collection With Image Recognition

Photo collections are only navigable and physically findable if what is seen is identified and keyworded correctly and the collection is numbered and physically sorted. When Frank Scholten's collection arrived at the University Library, only the negatives were sorted and categorised (Figure 2). Scholten had placed the negatives in envelopes himself, on which he had written keywords. These keywords were usually just a geographical location, sometimes with a thematic term added: for example, 'Jerusalem Juif' ('Jewish Jerusalem', meaning Jewish heritage and scenes in Jerusalem) or 'Jaffa Musulman' ('Islamic Jaffa', meaning Islamic heritage and scenes in Jaffa). However, there were also thousands of photographic prints (around 13,000, according to the final count of the digitisation machines), and these prints were completely disorganised and loosely stored in the moving boxes in which they had arrived at the library. The large number of prints, combined with the lack of organisation made cataloguing the individual photographic prints an impossible task. The photographic prints likely matched the negatives, but the question remained as to who would be able to match them. It would take years of work to catalogue the prints with only human eyes.

In 2020, we contacted Giles Bergel of the Visual Geometry Group at the University of Oxford for help with this task using image recognition.[6] Bergel had already used image recognition technology extensively in his research on Scottish printed chapbooks (Dutta et al., 2021). For the Scholten photo collection, Bergel and his colleagues created an online tool that automatically matched the digitised negatives and prints (Figure 3). This tool turned out to be important for the digitisation process itself as well. There was no need to sort the photographic prints before digitisation; we could have them scanned by box and numbered by the software randomly (Figure 4). The match with the negatives would be recorded in a concordance afterwards. The file names of the negatives would later become the basis of the inventory numbers of both negatives and photographic prints.

6. Giles Bergel is Senior Researcher in Digital Humanities in the Visual Geometry Group in the Department of Engineering Science at the University of Oxford. For the Visual Geometry Group, see https://www.robots.ox.ac.uk/~vgg/. Giles Bergel's personal website, explaining the image recognition projects he has been working on can be found at: https://www.printing-machine.org/.

Figure 2 – The Frank Scholten negatives in their original packaging: ca. 14.000 nitrate negatives in envelopes with a short caption by the photographer. Photograph ©UB Leiden, 2020.
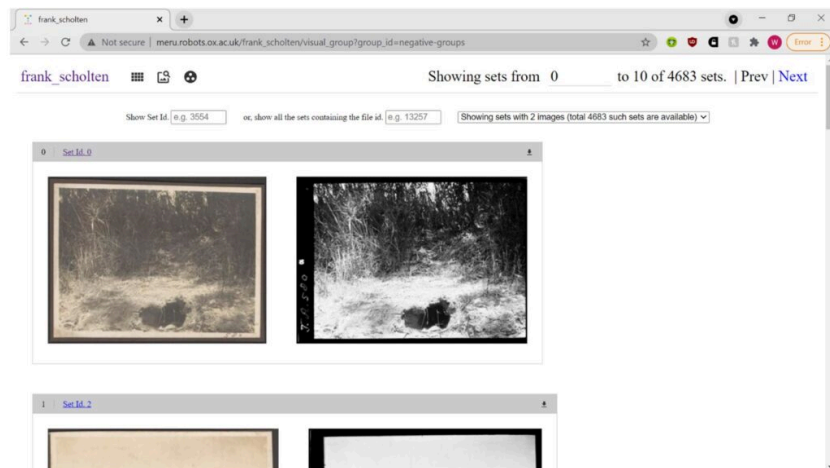

Figure 3 – Screenshot of Oxford University's software, linking the image files of the photographic prints to their matching negatives.

We found that not all 13,000 photographic prints had a matching negative. Ultimately, 31% of the negatives did not have a matching

photographic print, and vice versa: for 24% of the photographic prints, no matching negative could be found.[7] We were already familiar with the phenomenon in photo collections of negatives that did not have a matching print. After all, photographers send photographic prints by post to the editors of magazines or books for which they provide illustrations, or to their friends or family, keeping the negative at home or in their studio. Some negatives are never printed. Photographic prints without a negative are less common. Photographers tend to keep their negative archives with them. We, therefore, did not know whether part of Scholten's negative archive was lost or had gone elsewhere. These last questions remain unanswered to this day.

To our surprise, the Visual Geometry Group's software was capable of more than only matching photographic prints to their exactly matching negatives. The image recognition also grouped negatives with the prints with which they had something in common. Thus, negatives and prints were grouped depicting, for example, the same location, but a different event. Similarly, the same people were grouped, although appearing in separate locations. This capability proved ideal for the cataloguing work. By clustering the prints and negatives, it was possible to work much faster. In a year and a half, two temporary staff members managed to create basic records for the whole collection.

Working With Volunteers

Due to the limitations of the 2019–2021 COVID pandemic, metadata were mainly collected from the digital files of negatives and prints. Until then, no time or effort had been spent on repackaging and sorting the physical collection. Further examination of the prints revealed that in several cases, the photographer had written additional information on the back of the prints. We wanted to capture this information in the metadata as well. Moreover, the physical collection needed even more care:

1. We needed to assign an inventory number to each photographic print for identification. These numbers had to be noted on the verso

---

7. The total numbers were as follows: photographic prints: 12,756; match with a specific negative: 9,736 (76%); part of a larger set: 9,867 (77%); total number of negatives: 13,714; match with one or more prints: 9,513 (69%); part of a larger set: 11,105 (81%); total sets: 7,108 (of which ca. 4,680 consist of one print and one negative).

of each physical photographic print and linked with the digital version (Figure 4a);

2. The information written by Frank Scholten on the backsides of the photographs needed to be included in the metadata records;

3. The photographic prints also needed to be rearranged so that they could be stored in the same order as the negatives (Figure 4b), and this reorganisation would be key for visitors and collection employees to find their way around the collection;

4. Lastly, we wanted to repackage the photographic prints in Melinex transparent pocket sleeves, as doing so would protect them from wear and allow visitors to leaf through them easily at the same time.

Figure 4a – Temporary stacking of the photographic prints after digitisation – the computer added the numbers, the digitisation employee wrote the range of numbers on the label. Photograph ©UB Leiden, 2023.

Figure 4b – Workshop participant with concordance list for the sequence in which the photographic prints had to be picked amd repacked. Photograph ©UB Leiden, 2023.

Since these four actions, too, would imply significant work for the library, we decided to leverage our network. Fortunately, by that point, physical meetings were allowed again. We found volunteers with diverse interests, by publishing an article and announcements in local media and through our own social media channels.

Some volunteers were amateur photographers who had an interest in photography in general and loved to work with historical vintage photography. Others were interested in the specific subject matter. We also worked with volunteers with identities rooted in or related to Palestine. The workshop had Jewish people, people from Arab Palestine families, and also people who had been working in Palestine from NGOs or diplomatic positions. All volunteers worked together on the Scholten photo collection. Finally, we could rely on the library's regular group of alumni and Friends of Leiden University Libraries association members.

A paid coordinator was employed to organise the workshops. He made sure that everything was well arranged and that all volunteers had the facilities, materials, and the right instructions needed for their tasks.

We provided training in the handling of vintage photo collections and supplied all volunteers with the necessary tools, such as gloves, transparent pocket sleeves, and printed labels.

The Workshops

During the first workshop, the volunteers worked in pairs to match the physical and digital information of all the photographic prints. This task was done in several steps.

One volunteer took a photographic print from the stack and checked the image on the site created by the Visual Geometry Group. When a match was found, the volunteer noted the inventory number on the backside of the physical print. At the same time, their companion typed the text written on the back of the print in a spreadsheet, together with the inventory number. Later, this information was added to the metadata records.

The next step was to rearrange the print order to match the negatives' order and to repackage the prints in boxes with transparent sleeves. This task was the big challenge: it required addressing how to deal with thousands of prints in an orderly fashion.

The match between photographic print and negative, made by the Visual Geometry Group's software, turned out to be the solution. This concordance resulted in lists that contained two columns:

- The first column contained the list of photographic prints sorted in the sequence in which the computer had seen the images during the reproduction process.
- The second column contained a list of matching negatives.

The first step was to rearrange the concordance so that the first column was sorted according to the list of negatives. This order was the order given to the collection by photographer Frank Scholten.

Subsequently, we divided the list into 50 rows matching 50 photographic prints. This number corresponded with the material that could fit into one storage box. Thereafter, a print was made for each box. Each volunteer received a box filled with empty pocket sleeves, as well as a printed list. The aim was to collect all the prints destined for the new box.

Figure 5 – Volunteer workshop participants picking photographic prints, according to the sequence indicated on the concordance lists, from the temporary large brown boxes; subsequently storing the photographic prints in melinex pocket sleeves for permanent storage in the right order, as invented by the photographer. Photograph ©UB Leiden, 2023.

In preparation for the workshops, the original boxes with the photographic prints were positioned in a large rectangle, with each box indicating the range of the number of prints it contained. The volunteers were handed one new storage box at a time, together with a printed list of the numbers that needed to be selected from the boxes and the sequence in which they had to be stored in the sleeves. The volunteers all walked around with their own lists and boxes, selecting the prints from the boxes in the rectangle (Figure 5). All these steps were done in silence and with the utmost concentration, because the material was fragile, the numbers and the work precise, and the process prone to easily disruptioned. A mistake in reading or interpreting a number could make a photograph virtually untraceable.

After 17 whole-day workshop sessions, all the work was completed. The photographic prints were repacked in pocket sleeves and albums and labelled with the identifiers of the negatives, and the annotations written on the back by Frank Scholten were transferred to the metadata records

in our catalogue. Approximately 3,000 photographic prints for which AI could not find a matching negative were added to albums with the same geographical location as the subject: photographs of Jaffa were added to the 'Jaffa' albums, and so on. In this way, all the photographic prints were grouped in the clearest and most helpful way for future users.

Meanwhile, we also made the collection available online through our repository *Digital Collections*.[8] Because the collection is free of copyright, we were able to make all the scans available for download as well. This feature attracted worldwide interest. In 2023 and 2024, the collection received around 20,000 visits. The majority of users are from the Netherlands, but the second largest group of users are from the region itself (Israel, Palestine, and Jordan). We also calculated that users spend, on average, a considerably long time on the site (about an hour) and perform, on average, about 40 actions (page views, downloads, internal site searches). These statistics indicate an investigative use.

Visual Search

Despite all the efforts expended on cataloguing the collection, the records still contained only a basic set of metadata. In general, it is difficult to capture the richness of a photograph in a set of keywords. The result will always be incomplete and subjective. Therefore, we wanted to test whether it was possible to improve the searchability of our photo collections using visual search. One of our developers built a proof of concept based on Weaviate and OpenAI. It uses IIIF to create a new user interface for the collection. For example, if a user searches for 'cars', they will get all images with a car in them, even if the keyword 'car' is not in the metadata.

We are aware that the results may be biased. Given the sensitivity of this collection, particularly considering recent developments in the Palestinian–Israeli conflict, we have decided not to make this tool publicly available yet. The first step will be to test and train the application with a selected group of users, a plan for this still has to be established. Another project we have in mind is to invite specialists to provide information on specific aspects of the photographs, such as clothing, professions, and religious ceremonies. In this case, the AI tool

8. https://digitalcollections.universiteitleiden.nl/

can help make selections based on visual information, thus supporting the enrichment of descriptive metadata.

With this showcase, we wanted to demonstrate the following:

1. Innovative techniques are interesting not only for users but also for back-end processes in the library, such as speeding up the cataloguing process.
2. Crowdsourcing has many faces. It does not necessarily have to involve a large group, and the contribution does not have to be digital, but it can include physical activities as well.
3. Technology and human physical effort are interrelated. It is not possible to have one without the other. This collection, in particular, which is so large and involves so many different user groups, shows that there is a significant need for physical interaction as well.
4. Finally, although it is still an open door, digitisation is not limited to scanning and putting the collection online. It is the use of the collection that keeps us engaged, and together with researchers, we are constantly developing new applications to encourage and improve its use. The project has been ongoing for 5 years now, and we are not finished yet.

References

Dutta, A., Bergel, G., & Zisserman, A. (2021). Visual analysis of chapbooks printed in Scotland. In *HIP '21: Proceedings of the 6th international workshop on historical document imaging and processing* (pp. 67-72). ACM. https://doi.org/10.1145/3476887.3476893

Kwiecien, T. (2008). Frank Scholten. In *Geschiedenis van de Nederlandse fotografie in monografieën en thema-artikelen*, in *Depth of Field, 25*(40). https://depthoffield.universiteitleiden.nl/2540f05en/

Scholten, F. (1929). *La Palestine illustrée: Tableau complet de la terre sainte par la photographie, évoquant les souvenirs de la Bible, du Talmud et du Coran, et se rapportant au passé comme au présent*. Budry.

Scholten, F. (1930). *Palästina: Bibel, Talmud, Koran: Eine vollständige Darstellung aller Textstellen in eigenen künstlerischen Aufnahmen aus der Gegenwart und Vergangenheit des Heiligen Landes*. Julius Hoffmann.

Scholten, F., Smith, G. A., & Robinson Lees, G. (1931). *Palestine illustrated: Including references to passages illustrated in the Bible, the Talmud and the Koran*. Longmans.

Scholten, F. (1935). *Palestina: Bijbel, Talmud, Koran: Een volledige illustratie van alle teksten door middel van eigen artistieke foto's uit het heden en verleden van het Heilig Land*. Sijthoff.

Stork, D. G. (2024). Computer vision, ML, and AI in the study of fine art. *Communications of the ACM, 67*(5), 68-75. https://doi.org/10.1145/3633454

Wasielewski, A. (2023). *Computational formalism: Art history and machine learning*. MIT Press. https://doi.org/10.7551/mitpress/14268.001.0001

Zananiri, S. (2021). Documenting the social: Frank Scholten taxonomising identity in British Mandate Palestine. In K. Sanchez-Summerer & S. Zananiri (Eds.), *Imaging and imagining Palestine: Photography, modernity and the biblical lens, 1918-1948* (pp. 266-306). Brill. https://doi.org/10.1163/9789004437944_009

Abstract

Frank Scholten, a Dutch photographer with a deep interest in biblical landscapes, documented life in Palestine between 1921 and 1923. His photographs captured biblical sites, local crafts, landscapes, and a range of religious and cultural ceremonies. Following his death in 1942, his extensive collection—comprising approximately 14,000 negatives and 13,000 photographic prints—remained largely unorganised and inaccessible to the public.

To facilitate public access, Leiden University Libraries undertook a project that combined artificial intelligence (AI) with manual labour. Employing image recognition technologies, the team matched negatives with corresponding prints, thereby streamlining the cataloguing process. To further enrich the metadata, volunteers from diverse backgrounds—including individuals with personal or cultural connections to Palestine—participated in workshops where they helped to catalogue, repackage, and label the prints.

The collection has since been digitised, and in 2023–2024 it gathered interest considerable international interest, particularly from Israel, the United States, the Netherlands, and Jordan. Although the collection has

basic metadata, efforts are underway to enhance its discoverability through the application of AI tools. Given the sensitive nature of the material, these tools are currently being tested in a restricted environment.

The project demonstrates how the combination of technology and physical effort can render large and complex photographic archives accessible to both researchers and the wider public.

Keywords

Image recognition; Digitisation; Crowdsourcing; Photography; Palestine (1921-1923)

Unlocking the Value of Digitised Heritage Collections: Case Studies From ULiège Library

Renaud Adam; Laurence Richelle; and Stéphanie Simon

Heritage libraries have faced significant challenges in terms of their collections' visibility since the great digital conversion. In the context of an overabundance of resources and faced with major players such as Gallica or Google Books, it is necessary for smaller institutions to develop a strong strategy to support the dissemination of their digitised heritage. The need for discoverability of contents, thus, becomes a strategic issue for librarians. As defined by the French Ministry of Culture in 2020, this notion 'in the digital environment refers to its online availability and ability to be identified among a wide range of other content, particularly by someone who is not specifically searching for it' (Ministère de la culture, 2020). The audiovisual sector was first influenced by this concept to enhance the findability of content on the web against major streaming actors (Thoër et al., 2022). It gradually came to encompass all cultural industries (e.g. bookselling, music). Discoverability also became a topic of interest for library managers who integrated it into their strategic planning for the development of their digital libraries or repositories (Bastard & Laborderie, 2023; Macgregor, 2023). This issue has been under consideration by ULiège Library for the last few years. This paper presents some practices that have been implemented by ULiège Library.

DONum: A Project of Digitised Objects Repository

This section traces the history of the DONum project, from its inception as a dedicated platform for digitised heritage objects to its evolution into a comprehensive repository. It outlines the benefits of this project for the collections' curators, offering enhanced visibility and access to digitised collections. Furthermore, it highlights how DONum has grown beyond its initial purpose, becoming an essential tool for mediation and user engagement while continuing to support the academic community's needs for research and discovery.

The DONum project was born in 2009, within the consortium of French-speaking Belgian university libraries (*Bibliothèque*

Interuniversitaire de la Communauté française de Belgique, BICfB). At the time, it was considered an ambitious initiative, seeking to create institutional repositories for digitised objects within each collection-holding institution, along with a shared platform to present all these collections. This ambitious nature meant the project required several years of development. Indeed, within each institution, digitisation policies and projects varied in scope and were at different stages of advancement. Moreover, the heritage collections themselves were of varying scope and nature. In some institutions, such as in Liège, numerous departments, services, and laboratories would be potentially concerned, with heritage collections extending beyond the library's documentary holdings alone. Other university institutions experienced mergers during the same period, altering the scope of institutional projects.

The planned institutional portals were put into production separately, depending on the state of advancement, between 2012 and 2018. At the University of Liège, DONum (running on DSpace) went online in February 2015.[1] A month later, in March 2015, the library also launched the interinstitutional portal, called DONum BICfB, the development of which had been entrusted to it.[2]

ULiège Library preserves collections that were inherited at the time of the University's creation in 1817 and which have grown thanks to research, gifts, bequests, or acquisitions (Raxhon & Granata, 2017; Brassinne, 1924). At present, the University of Liège's collection is ranked among the largest heritage collections in Belgium, after the Royal Library of Belgium and Ghent University. It comprises 6,800 manuscripts (dating from the 9th century to the present), 570 incunabula, between 45,000 and 50,000 rare books, and dozens of archival fonds. While its Library is notable for preserving extremely important heritage collections, the University of Liège also stands out for containing several services that preserve heritage collections of various natures, including documentary, artistic, historical, and scientific collections. These services were federated into the Museum and Cultural Centre in 2021.[3] From the outset, DONum was intended to be open to all partner services with

1. https://donum.uliege.be
2. http://donum.bicfb.be
3. https://www.musees.uliege.be

digitised collections. Moreover, the portal was designed from the start to adapt to the description grid necessary for objects of various natures.

When it was put into production, DONum included just under 1,000 objects from the collections of the library and the *Maison de la Science* Museum. The initial collections were rapidly enriched, and new partners joined the project. The Wittert Museum chose to integrate thematic collections related to its temporary exhibitions from 2015.[4] Palaeontology collections also found their place, following the work of an intern. Subsequently, the portal was joined by the collections of the *Musée d'Art Contemporain en Plein-Air* (MACPA), the contemporary art museum of the University of Liège located on the heights of the city.[5]

DONum quickly demonstrated significant advantages for the library and partner services after it was launched. These advantages remain relevant to date. The first advantage concerns the conservation or preservation of documents and objects. While the University preserves exceptional heritage collections, it is also – primarily – a living research and teaching institution. The collections are not dormant: they are used every year by students, teachers, and researchers. However, these collections are fragile since, aside from their natural deterioration due to time, they suffer from frequent handling and consultations. The digitisation projects carried out within the institution by the various services have already made preserving digital reproductions possible, fixing their state at a given moment, regardless of their future evolution. DONum goes further by making this digital reproduction accessible to a wide audience, particularly the university community. Once accessible in DONum, the original documents can be adequately preserved. The consultation of documents housed in ULiège Library and Wittert Museum can be limited to a few cases of material or codicological studies, thus slowing down the effects of time on their physical state.

While DONum addresses an issue for librarians, it also meets the current needs of the university community and the public. The digital library facilitates access to documents, removing the constraints of physical consultation such as library opening days and hours, limited numbers of copies, and the impossibility of borrowing. On DONum, documents are accessible to an unlimited number of users without time

4. https://www.wittert.uliege.be

5. https://www.museepla.uliege.be

or location constraints. Thus, the work of students and researchers, which often requires flexibility, is simplified.

For all partner services and the institution, DONum presents advantages in terms of valorising collections. Visitors can find a representative example of the richness and diversity of the institution's heritage on a single platform. The collaboration of several services on the same platform allows for cross-promotions, associating collections of various natures in the same communications.

The DONum project is also part of the open access policy of the University of Liège. DONum aligns with other projects launched at the University of Liège, as in other universities in Belgium. With open access as its foundational principle, DONum is a complementary facet to the other portals, namely Open Repository and Bibliography (ORBi), the institutional archive of the University of Liège;[6] *Portail de Publication de Périodiques Scientifiques* (PoPuPS), the portal for diamond open access academic journals and proceedings;[7] and Master Thesis Online (MatheO), the portal for accessing to the University's master's theses.[8] For better and more comfortable access, the digitised files in DONum have been reduced to a lighter format while still allowing real readability. In any case, high-resolution copies are available, under some conditions, from the department or service conserving the physical item.

As of July 2025, the portal hosts more than 13,000 items. The printed books section is the largest, comprising 5,100 books from the 16th century to the present day; this section includes nearly 36% of all objects deposited in DONum. The prints and engravings (about 1,900) section is the second largest, and it includes more than 300 pieces from the 16th century executed by the great masters of the Renaissance, such as Albert Dürer, Lucas Cranach, Pieter Bruegel, and the Wierix brothers from Antwerp. DONum also houses fewer than 1,000 manuscripts. The two oldest manuscripts date from the 9th century, one fragment of the *Vita Karoli Magni* (*Life of Charlemagne*) written by Einhard and a collection of texts by Hieronymus and Bede the Venerable. ULiège Library has almost all its incunabula in DONum, resulting in 552 digitised incunabula. A few dozen incunabula could not be digitised

---

6. https://orbi.uliege.be

7. https://popups.uliege.be

8. https://matheo.uliege.be

for reasons of preservation (e.g. poor condition of the book, damaged binding).

In addition to the classic features for searching inside the portal, two aspects have been developed to improve the visibility of digitised collections. Scientific blogging is the first aspect. These blog posts have been conceived as scientific mediation tools. They support digitisation projects by providing scientific presentations, linking to a selection of digitised books and bibliographical references. The selection of themes relies on three main aspects: actuality, the promotion of a specific collection or an author, and exhibitions organised at the University or in collaboration with partners. The home page of DONum allows access to the various blog posts. Thus far, the authors of the posts have been library staff members.

One of the latest posts celebrates the 300th anniversary of the birth of Immanuel Kant (22 April 1724).[9] The idea behind this post was to provide an entry point into the philosophy of the renowned German philosopher and a guide to his 19th-century works held at the ULiège Library. Another post was written at the end of a project concerning the digitisation of all handwritten chronicles from the early modern period relating to the history of the principality of Liège.[10] The objective was to increase awareness among the patrons of ULiège Library about the richness of manuscripts in this collection. In 2023, ULiège Library decided to publish a post dedicated to the patron saint of the city of Liège, Saint Lambert. Published on 17 September 2023, the day of this saint's feast,[11] this text offered an occasion to explore the historical figure of this bishop assassinated in Liège in the late 7th or early 8th centuries. This martyrdom marks the starting point of the foundation of the city. The construction of his legend was then evoked before returning to the iconography related to him and the surviving practices of worship from the 19th century.

The purpose of the blog posts is to translate scientific subjects into a more accessible and understandable format for users of ULiège Library, whether they are students, researchers, professors, or amateurs. The goal

---

9. *Kant : trois cents ans d'une méthode immortelle*, https://donum.uliege.be/news?id=56
10. *À la rencontre des chroniques liégeoises de l'époque moderne*, https://donum.uliege.be/news?id=55
11. *Un meurtre, une ville, un évêque... l'histoire de saint Lambert*, https://donum.uliege.be/news?id=53

is to use the DONum portal to give the user community access to high-quality knowledge grouped around a specific theme, as well as digitised works related to this subject.

Moreover, in 2015, an idea was born around the possibility of optimising the visibility of heritage collections in open access by associating scientific content of great rigour, accessible free of charge, with the digital objects of the University of Liège. Alongside metadata and digital representation, users have access to a new tab in DONum containing scientific presentations of digitised resources, as it can also be found in an exhibition catalogue (Figure 1). The texts offer biographical information about the author and a description of the book's contents, its eventual significance, and certain aspects of the copy (e.g. ownership mark(s), binding, illumination).

Figure 1 – Scientific presentation of ULiège Library's manuscript 3173 (Anselmus Leodiensis, Gesta Pontificum Leodicensis ecclesiae) on DONum.

These approaches place librarians as knowledge prescribers. They are seen as experts in content production and curation and knowledge mediation and as facilitators of the circulation and sharing of information and knowledge.

However, given the size and the variety of the collections, partnerships were developed with laboratories within the University. The plan was to utilise crowdsourcing to generate scientific content for the DONum portal. ULiège Library contacted the research unit *Transitions*, which gathers PhD students, researchers, and professors working on the Middle Ages and the Early Modern period. This collaboration led to the development of the *Arm@rium Universitatis Leodiensis* in 2017.[12] The digital library of the Middle Ages and the Early Modern period of the University of Liège is a unique tool in Belgium. For the first time, scholars and librarians have been collaborating to propose scientific content associated with digital representations of manuscripts, prints, and early printed books, and the collaboration is still ongoing. However, crowdsourcing has some limitations (Benil, 2022). The most significant problem is the potential absence of willingness of volunteers. The success and sustainability of this project are greatly dependent on the availability, desire, and involvement of these researchers (Di Méo, 2025).

Simplifying Access and Enhancing Discoverability: Integrating DONum Into the Library Catalogue

Beyond ensuring the preservation and digitisation of heritage collections, providing seamless access to these resources is a key mission for ULiège Library. This section explores how the digitised content curated within DONum has been progressively integrated into the Library's discovery tools and catalogue infrastructure. The integration complements the preservation work by enhancing discoverability, linking digital and physical representations, and adapting to evolving user expectations in terms of access and navigation.

In 2013, ULiège Library moved from its traditional Aleph OPAC to a more efficient next-generation solution allowing the integration of external resources: the Primo discovery tool (by Clarivate | Ex Libris). In February 2015, the libraries completed their migration from the integrated library system Aleph to the library management system Alma (also by Clarivate | Ex Libris). The public catalogue stayed operational with Primo BO (Primo Back Office).

---

12. https://www.transitions.uliege.be/cms/c_4051720/fr/transitions-arm-rium-universitatis-leodiensis

To enhance the visibility of digitised heritage collections, and considering that Primo is the primary access point for resource discovery, open access collections from various digital archives of the Belgian French-speaking university libraries were harvested by ULiège's Primo from the so-called DONum BICfB repository from early 2016. Moreover, digitised materials with restricted access from ULiège were also included. Thus, two DONum datasets – one each from ULiège and DONum BICfB – were integrated into the University discovery tool.

This integration is not without its problems of consistency and quality. For ULiège resources, two distinct records appear in a search result – one from the Alma library management system (LMS) for the records related to a physical copy and the other from DONum (DSpace instance) for the records related to a digital representation. Several issues come to light, including different treatments of specific document types such as bound-with volumes, or Sammelbands, in the two interfaces; erratic linking between records; and a relevance ranking that does not always place printed and digitised resources consecutively in search results. Since the early configuration of Primo in 2013, a 'Heritage Collections' facet has been generated based on a specific element in the MARC21 source record. However, only physical documents benefit from this facet, excluding the digitised objects from DSpace, which can limit its effectiveness and relevance (Richelle & Goukens, 2019).

Furthermore, as the LMS has a digital asset management (DAM) component, there are many questions about the possibilities for integrating DONum data and potential interoperability. One issue under consideration concerns the import of DONum ULiège data into Alma, encompassing both metadata and digital representations associated with collections that do not belong to the library, such as artefacts and palaeontology collections. This issue also involves determining whether existing Alma and DONum records should be merged during the import process and identifying the reliable criteria upon which such decisions might be based. Furthermore, it is also necessary to evaluate the appropriateness of utilising Alma's digital component (Alma Digital) for file storage.

Together with the analyses of tools and integration possibilities, consideration must also be given to the computerisation and visibility of manuscripts and archival collections. The few medieval manuscripts

selected under the first PEP's plan[13] of the Wallonia-Brussels Federation have been described in both DONum and the LMS (at that time, Aleph), without any technical integration between the tools. On the occasion of a conference held in Liège in 2017 (Tilkin, 2020), a provisional solution was implemented regarding the management of archive inventories. To highlight the Weissenbruch family of printer archives, an XML editor (Oxygen) has been used for EAD encoding. An XSL transformation then displays the content in a user-friendly format, allowing for tree-like navigation and webpage searching (Richelle & Goukens, 2019).[14]

To ensure coherent integration of the various components of the Weissenbruch collection, including the preservation measures applied to them (such as conservation and digitisation) through the use of dedicated tools (Oxygen, DONum), and to facilitate efficient access and management of the collection, a MARC21 record was created in the LMS Alma. In this record, the archive was described concisely, and an item was created for each folder, box, photo album, or object – everything that could be requested by users. The MARC record serves as the central point leading users to different access paths, namely access to original archive documents via the 'physical items', access to descriptions of books and periodicals stored in other sections of the Library, access to digitised parts stored in DONum as explained by Simon (2020),[15] and access to the detailed archive inventory webpage. At that time (i.e. 2019), only the physical and electronic inventory components of the LMS were in use (Richelle & Goukens, 2019)[16] as the digital component was not yet deployed.

This framework became the starting point for further reflection on the DONum–Alma–Primo integration.

13. Since 2008, the digitisation plan known as *Préservation et Exploitation des Patrimoines* (PEPs) has had two objectives: (1) to preserve the cultural heritage of the Wallonia-Brussels Federation through digitisation campaigns, taking care to safeguard the cultural and heritage collections held in museums, archive centres, libraries and audiovisual institutions, and (2) to enhance this heritage by providing access to the digitised collections via the www.numeriques.be portal.

14. https://app.lib.uliege.be/archives/fonds_weissenbruch.xml

15. https://donum.uliege.be/handle/source/weissenbruch

16. The use of the digital component will come later, with the implementation of Primo VE in 2019.

During 2018–2019, ULiège Library implemented Primo VE, a new cloud-based deployment model designed to optimise the management and delivery of the Primo discovery solution. This implementation presented an opportunity to rethink how DONum was integrated into the discovery tool. Simplifying the user experience to avoid redundancy and confusion in the search results became the priority. Furthermore, a Primo feature remained unused, namely the new Primo VE model managed entirely through the Alma back office, which offers configuration ease that simplifies the implementation of the Collections feature. In Alma, a collection refers to an entity that brings together bibliographic records which share a certain form of relationship. Such a collection may be organised around a particular theme or subject area; for instance, a collection entitled *Bob Dylan*, focused on the renowned singer, might encompass a wide variety of materials including physical resources such as biographies and sheet music, as well as digital audio and video recordings of live performances and studio sessions. It may also include various holdings of songs and albums in multiple formats. Importantly, each collection is associated with its own bibliographic record and may contain items across different resource types, including physical, digital, and electronic formats (Ex Libris, n.d.-a).

The Collection Discovery interface in Primo enables users to browse collections that are defined in Alma. The front-end Primo interface will refer to them as 'Galleries', thereby highlighting the heritage aspect that has been at the core of the project from the outset, since one of the initial considerations surrounding these 'collections' was the possibility of offering a 'catalogue of manuscripts'.

Attention has, therefore, been turned to the structure established in 2017 for the Weissenbruch Collection, which was subsequently applied to other archival collections. New strategic choices are being implemented as enhancing the front-end and the user experience requires improvements in resource management:

- The collective DONum–BICfB instance, which aggregates BICfB institutions' repositories, is no longer harvested as a whole. Instead, a set is published per institution, and separate import profiles allow for a more tailored approach to each repository.

- While the DONum ULiège DSpace instance is still harvested, it is now only used for digitised materials that are not part of the library collections, such as the Wittert Museum collections,[17] MACPA collections,[18] and palaeontology collections.[19] Various import profiles – one per document type – are created in the Primo VE configuration.
- Digitised documents held by libraries, such as books, manuscripts, and cartographic materials, are linked in Alma to the description of the corresponding physical resource in the form of a digital inventory accessible remotely via the DONum repository (no files are stored within the LMS itself). By the time the new Primo was launched in September 2019, about 2,400 DONum records had been manually integrated as a digital inventory in Alma.

Alma Digital has, thus, been used not only to manage access to digitised heritage resources but also to facilitate access to other digitisation projects beyond DONum. One such project is eTFE, which focuses on the digitisation and online dissemination of students' final-year papers and master's theses. As with DONum, access was initially managed through external links to PDFs stored on a local server, integrated into Alma. However, due to contractual and financial constraints, this solution was replaced for the eTFE project by its equivalent in Alma's electronic component (Alma-E). For catalogue users, the result remains the same: the new Alma electronic collection contains all portfolios and records along with a link to the electronic inventory, and access to the digitised dissertations is provided via a link to the remote server on which the PDFs are stored.

Meanwhile, the computerisation of the manuscripts has continued, not within the integrated library system (LMS), as was the case in 2013 for the medieval manuscripts included in the PEP's programme, but using the Oxygen environment and EAD encoding. This work has remained confidential, however, as no public search interface was ever planned.

The challenge now is how to make these descriptions accessible. Some manuscripts are digitised and available on DONum, but the DSpace instance only provides limited metadata and does not allow for linking

17. https://donum.uliege.be/handle/provenance/collartist
18. https://donum.uliege.be/handle/provenance/museepleinair
19. https://donum.uliege.be/handle/provenance/fossils

between records or creating a hierarchical structure. Although this instance provides digitised content, it does not serve as a substitute for the catalogue or the EAD environment, both of which are capable of supporting significantly richer metadata structures. Once again, several options were examined, including the development of a specialised search interface based on the EAD files. However, such a project would have been time-consuming and disproportionate to the number of documents concerned at that stage. The possibility of importing the EAD content into Alma was also considered, but preliminary tests yielded inconclusive results, leading to the swift abandonment of this approach.

The project is, thus, evolving towards a dual encoding of manuscripts, in EAD via the Oxygen environment and in MARC21 within the LMS.[20] In some cases, a third layer is added through DONum, along with a digital inventory in Alma when the item has been digitised. The dual 'physical/digital' inventory structure in Alma also compensates for the lack of a two-level hierarchy in DONum, which had previously hindered the online dissemination of digitised periodical collections. As a result, digitised periodicals have now also been made accessible via Primo. It is also worth noting that certain institutions, such as the Royal Danish Library, have opted to catalogue their collections of manuscripts and private archives in the MARC21 format directly within the Alma system and store detailed digital representations of the finding aids through Alma Digital (Toftgaard, 2024).

The approach adopted in Liège forms part of a broader strategic reflection on the valorisation of heritage collections. The digital representations remain stored in the DSpace instance, and the DONum portal continues to serve as the primary access point for digitised resources alone. However, the discovery tool opens up new possibilities. While the need for proper cataloguing has clearly been addressed through the various solutions implemented, there is also a growing demand for a search interface aligned with researchers' practices, such as provenance-based navigation for manuscript collections.

Heritage Galleries With Primo Collection Discovery

This section returns to the functionality mentioned earlier: the use of Collections in Alma and Primo has allowed rethinking the visibility of

---

20. The encoding in EAD using the Oxygen tool has been maintained to this day.

manuscripts. In this context, adding a digital inventory to a bibliographic record requires associating the record with a Collection. While many digitised resources, despite their heritage value, do not need to be prominently featured (or are highlighted only temporarily as part of an exhibition), others require a differently structured presentation. In addition to the physical/digital association within the catalogue and discovery tool, a representation of these collections as distinct entities needs to be made possible. Thus, the Collection Discovery component will serve as an online inventory mechanism for the manuscript holdings.

A parallel issue arises in the case of early printed books. The University holds 570 incunabula, all catalogued in MARC21 within the library management system and digitised. However, within the broader environment of the discovery tool, such works risk remaining obscured. A more targeted approach, such as categorisation by place of printing,[21] would more effectively meet the needs of specialist users.

To broaden the scope and impact of this functionality, additional types of collections have subsequently been incorporated alongside these two initial sets. These include materials relating to the historical heritage of Liège; archival holdings; noteworthy works in various disciplines such as architecture, botany, and law; and collections of cartographic materials.

Following recent updates deployed by Clarivate | Ex Libris, the Collection Discovery feature has undergone significant enhancements. It now supports searching across all metadata contained within a record, thereby reinforcing the decisions made by the library systems team. From the Collections Lobby, users can search the Galleries component as a whole[22] or explore individual galleries, retrieving indexed data from both the bibliographic record (including non-preferred terms from authority records linked to access points) and the holding record (such as copy-specific notes and codicological details). Moreover, multilingual descriptions have been added to the titles of collections, and the majority of records now display a thumbnail image.

Significant changes have been made to the initial framework of the Galleries, including the introduction of new collections and the reorganisation of existing ones. However, their use remains confined to

21. A country–city–printer hierarchy was considered initially but quickly abandoned as it resulted in too many clicks for the user.
22. https://explore.lib.uliege.be/discovery/collectionDiscovery?vid=32ULG_INST:ULIEGE

a subset of the heritage materials (Figure 2). Neither have all documents been digitised nor are all documents amenable to digitisation; moreover, not all digital items have been incorporated into the defined collections. This selective approach underscores the fact that the Galleries are not intended to serve as a mere alternative interface to the catalogue but rather as a distinct curatorial framework.
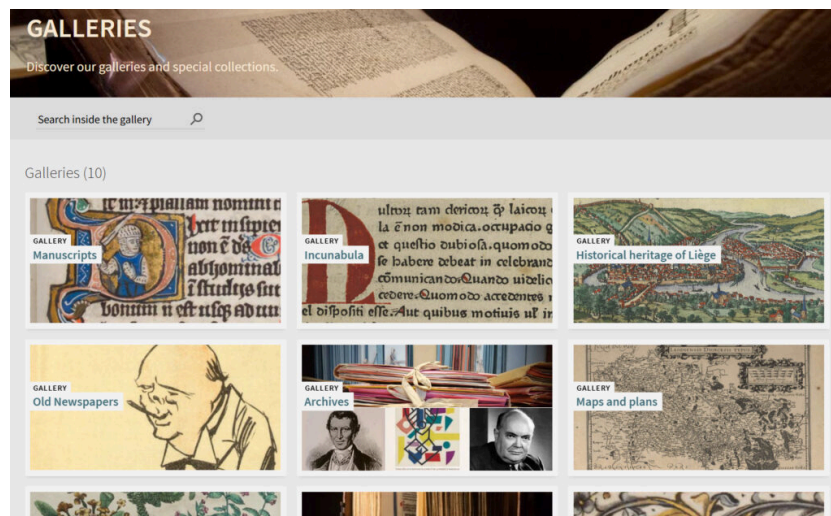
Figure 2 – The heritage Galleries.

Legito: An Independent Primo View

Despite the completion of the Collection Discovery component, a critical need persisted for a dedicated search interface specifically designed for manuscript materials – one that would support granular levels of indexing and provide facets aligned with the distinctive characteristics of this resource type. At that juncture, the proposal to implement a parallel Primo VE view, later called Legito, operating independently from the main ULiège Library production view, was considered a simple and effective solution. It was, therefore, not deemed necessary to seek out a new tool dedicated exclusively to manuscripts and archives that would offer greater functionality than the existing XML editor. The decision was made to encompass not only manuscripts and archives but also all printed material classified as heritage: incunabula and publications printed before 1831, as well as rare editions published thereafter. The focus remained strictly on institutional holdings, whether

digitised or not, thereby excluding electronic resources and the Central Discovery Index, 'a central, unified index, for scholarly and academic material worldwide' (Ex Libris, n.d.-b), which constitute the core of the discovery tool.

The structure of the search interface, therefore, required a re-evaluation in light of the specific characteristics of this 'heritage' corpus. This process entailed, first, a careful assessment of user needs, followed by a critical analysis of the default configuration settings to determine which elements should be excluded, adapted, or retained.

A primary divergence from the main production view was the reintroduction of search scopes at the simple search level. Whereas the main view is based on a blended search scope, the heritage-focused interface foregrounds the three principal categories of materials it comprises – printed works, manuscripts, and archival documents – thus aligning the search logic more closely with the conceptual organisation of the collection.

The first facet that is displayed is related to the genre or form of the document. This genre/form is based on the RAMEAU controlled vocabulary[23] and allows filtering by document forms, such as periodicals, maps, or brochures, as well as by genre, including categories such as 'mazarinades' and popular songs. It also includes other typologies to serve specific local needs, for example, incunabula and broadsides.

This facet replaces the traditional top-level facet in Primo VE views, which has been repositioned to the bottom. The top-level facet serves to isolate online resources, that is, those with a digital representation within DONum.[24] As of mid-October 2024, this facet retrieves 6,015 results, corresponding to 6,015 digitised works. Subsequently, a series of tailored facets is provided, reflecting both the nature of the documents and the specific needs articulated by users. These facets include provenance, printer, country and city of printing or creation, illuminator, and

23. RAMEAU (*Répertoire d'autorité-matière encyclopédique et alphabétique unifié*) is a French-language subject authority system used in libraries for indexing. It is comparable to the Library of Congress Subject Headings (LCSH) but adapted to francophone cultural and documentary contexts.

24. Mostly from DONum: archive fonds, which do not necessarily have associated digital representations, or only partially, have their inventory accessible online, either via the publication of the EAD file, or via publication in ORBi by the authors of the inventory.

illustrative content. Equivalent limits are also integrated into the advanced search form, which offers search filters for printers, illuminators, and provenances.

This configuration extends beyond the default Primo VE setup. Although it seems rich and contextual, it is constrained by the inherent limitations of the system. Notably, the extensive array of name forms linked through authority records is lost once the default configuration is modified. For example, a search for 'Plantijn' within the 'Printer, Publisher' index returns no results, even though it is a variant form in the authority record 'Plantin, Christophe',[25] which is used in the bibliographic record to identify the printer.

These necessary adaptations implemented to finalise the project have positively impacted data quality. Numerous records have been reviewed, and their metadata has been enriched and consolidated. Some documents recorded as undated in the catalogue can, thus, be more precisely identified and successfully integrated into the heritage scope. Furthermore, the project has led to the establishment of a clear and consistent cataloguing policy for heritage collections.

In addition, the Gallery facet has been retained in its original form from the main Primo view. The 'Find It @' feature, which allows extending the search to external catalogues or databases, was adapted for this scope: users can broaden their search to the local scanned paper records database (called *Scribe*) or redirect their search to external bibliographic resources such as the Incunabula Short Title Catalogue (ISTC) or the Universal Short Title Catalogue (USTC).

In June 2020, the Legito catalogue was launched with about 36,000 records.[26] By the end of 2024, this number had grown to nearly 38,000, comprising close to 1,300 manuscript records; 36,400 descriptions of printed documents, of which 34,550 relate to works printed before 1831; and 29 archival collections. Of all these, 955 manuscripts and 5,035 printed works have been digitised.

The future of this tool, however, remains uncertain. The new version of the Primo front-end, called Next Discovery Experience (Primo NDE), may, in the medium term, provide opportunities to enhance our user

---

25. Heading for 'Plantin, Christophe (1520?-1589 ; imprimeur-libraire)' in IdRef, https://www.idref.fr/03447675X.

26. https://explore.lib.uliege.be/discovery/search?vid=32ULG_INST:Legito

services. Conversely, it may necessitate a reassessment of certain strategic or technical choices made during the development of the Legito project.

DONum–Alma–Primo: Towards True Integration?

Following the various efforts undertaken to enhance and streamline the user experience, the question of achieving genuine integration between the different tools now arises. Currently, metadata in DONum is manually entered by copy-pasting data from the Alma LMS or the record displayed in the discovery tool. This process introduces inconsistencies: when a MARC record is updated in Alma, the changes are not necessarily propagated in the DSpace instance. The only persistent identifier linking the systems is the barcode assigned to the physical document. However, this identifier proves insufficient in certain cases, particularly with bound-with volumes, where only one barcode is used in the LMS.

A preliminary analysis of the situation reveals the need for integration at the metadata level. This integration involves injecting the system identifier from the LMS into DONum, establishing an export profile or regularly publishing Alma data, and developing a robust mapping between Alma and DSpace. Moreover, this integration must be bidirectional: not only should the digital representation be registered within Alma through the use of APIs but also the holdings data, reflecting ongoing preservation activities, should likewise be updated in real time to ensure consistency and completeness across platforms.

Although the lack of integration between DONum and the LMS has already been noted, we also regret the lack of connection between the two Primo views – the main one for all ULiège Library resources, based on a complete discovery experience, and another one limited to physical heritage collections, whether digitised or not. It is worth considering whether a renewed evaluation, prompted by the development of the tools themselves, might help to resolve some of the current limitations and shortcomings.

A further concern lies in the delineation of the collections' scope, particularly in the criteria used to define it. This delineation is currently determined either by the resource's date of printing or creation or through the manual insertion of a local MARC field. In the latter case, a lack of consistency between the content in DONum and Legito is regularly observed: some digitised documents dating from after 1830, which might reasonably be expected to fall within the heritage collections, are missing

from Legito. This inconsistency must also be addressed in any future development or refinement of the associated tools.

As noted previously, the current limitations in search functionalities also warrant further scrutiny. It will, therefore, be necessary to assess the relevance of such a specific approach and explore alternative strategies for showcasing the richness and diversity of our heritage holdings.

Conclusion

The policy of ULiège Library to increase the discoverability of its digital heritage collections operates across multiple layers. While DONum was conceived as the principal platform for the dissemination and promotion of the University's digitised holdings, institutional efforts have extended well beyond this initial framework. It is unrealistic to assume that all visitors, whether students, researchers, teachers, or members of the general public, are familiar with DONum or will intuitively navigate to it to explore or search the collections. In the contemporary digital environment, institutions must adopt a multifaceted approach to ensure a seamless and intelligible access pathway to their collections, tailored to the varied needs and contexts of different user groups.

The navigational fluidity is achieved by implementing coherent and systematic interlinkages between tools and initiatives, as well as by paying meticulous attention to metadata and referencing practices. Such efforts enable users, regardless of their prior knowledge of DONum or the University of Liège, to discover these resources intentionally rather than serendipitously. Along this access pathway, the provision of contextual and interpretative content serves to deepen users' engagement and understanding of the collections. From this perspective, all the initiatives discussed in this chapter are intended to function in a complementary and mutually reinforcing manner.

These initiatives, though distinct in their objectives and target audiences, converge towards the same goal of making ULiège's heritage collections accessible and meaningful to a diverse range of users, thereby enriching the Library's mission to preserve and disseminate cultural heritage.

References

Bastard, I., & Laborderie, A. (2023). La découvrabilité des collections numériques patrimoniales sous l'angle des usages de Gallica. *Bulletin des bibliothèques de France*. https://bbf.enssib.fr/matieres-a-penser/la-decouvrabilite-des-collections-numeriques-patrimoniales-sous-l-angle-des-usages-de-gallica_71295

Benil, J. (2022). Crowdsourcing in libraries in the digital age. *Library Philosophy and Practice*, Article 7350. https://digitalcommons.unl.edu/libphilprac/7350/

Brassinne, J. (1924). Bibliothèque de l'Université de Liège. In O. Gilbart (Ed.), *Liège, capitale de la Wallonie. Ouvrage publié à l'occasion du 48ᵉ congrès de l'A.F.A.S.* (pp. 289-291). Thone. https://hdl.handle.net/2268/268918

Di Méo, N. (2025). How can librarians and researchers work together? Digitising corpora of photographs and projection plates at the University of Strasbourg. In F. Renaville, R. Adam, & C. Oger (Eds.), *Opening up our heritage: Challenges and opportunities in digitising and promoting cultural and research collections*. Presses Universitaires de Liège, ULiège Library. https://doi.org/10.25518/978-2-87019-330-3.03

Ex Libris. (n.d.-a). *Managing collections*. Retrieved April 4, 2025, from https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/040Resource_Management/050Inventory/050Managing_Collections

Ex Libris. (n.d.-b). *An overview of CDI*. Retrieved April 4, 2025, from https://knowledge.exlibrisgroup.com/Primo/Content_Corner/Central_Discovery_Index/Documentation_and_Training/Documentation_and_Training_(English)/CDI_-_The_Central_Discovery_Index/010An_Overview_of_the_Ex_Libris_Central_Discovery_Index_(CDI)

Macgregor, G. (2023). Digital repositories and discoverability: Definitions and typology. In L. Woolcott & A. Shiri (Eds.), *Discoverability in digital repositories: Systems, perspectives, and user studies* (pp. 11-31). Routledge. https://doi.org/10.4324/9781003216438

Ministère de la culture. (2020, November 29). Découvrabilité en ligne des contenus culturels francophones. https://www.culture.gouv.fr/

thematiques/europe-et-international/Publications/Decouvrabilite-en-ligne-des-contenus-culturels-francophones

Raxhon, P., & Granata, V. (2017). *Mémoire et prospective. Université de Liège (1817-2017)*. Presses Universitaires de Liège.

Richelle, L., & Goukens, M. (2019, January). *Gestion et référencement des manuscrits et fonds anciens à l'ULiège* [Paper presentation]. Erasmus Staff Training Week 2019 : Le SGB au service de la modernisation de la bibliothèque, Liège, Belgium. https://hdl.handle.net/2268/321093

Simon, S. (2020). Le fonds Weissenbruch, une histoire de l'imprimé rejoint la sphère numérique : nouveaux outils, nouvelles méthodes, nouvelles recherches ? In F. Tilkin (Ed.), *Trois siècles d'histoire du livre et de la pensée à travers le Fonds Weissenbruch. Du Journal encyclopédique aux humanités numériques* (pp. 223-237). Archives générales du Royaume. https://hdl.handle.net/2268/257285

Thoër, C., Boisvert, S., & Niemeyer, K. (2022). La télévision à l'ère des plateformes. *Questions de communications*, (41), 315-338. https://doi.org/10.4000/questionsdecommunication.29183

Tilkin, F. (Ed.). (2020). *Trois siècles d'histoire du livre et de la pensée à travers le Fonds Weissenbruch : Du Journal encyclopédique aux humanités numériques : Colloque organisé par ULiège Library, le Groupe d'étude du dixhuitième siècle et des révolutions (ULiège), les Archives de l'État en Belgique et la Commission royale des monuments, sites et fouilles de Wallonie (Liège, 22-23 novembre 2017)*. Archives générales du Royaume.

Toftgaard, A. (2024, September 11). *Cataloguing manuscripts and private archives in Alma*. [Paper presentation]. IGeLU 2024 Conference and Developers Day, Copenhagen, Denmark. https://igelu.org/wp-content/uploads/2024/10/1662-107288-%E2%80%93-Cataloguing-manuscripts-and-private-archives-in-Alma.pdf

Abstract

This paper examines the strategies developed by the University of Liège (ULiège) Library to enhance the discoverability and value of its digitised heritage collections. In a landscape dominated by large-scale digitisation platforms, smaller institutions face the challenge of ensuring the visibility and accessibility of their cultural assets. The DONum project (*Dépot*

d'Objets Numérisés), launched in 2009, exemplifies ULiège Library's response to these challenges. Initially conceived as a digitised objects repository within a consortium of Francophone Belgian university libraries, DONum has evolved into a comprehensive and inclusive platform hosting over 13,000 digitised items. This paper explores how DONum not only facilitates conservation and public access but also integrates open access principles, scientific mediation through blogging, and crowdsourced content via academic partnerships such as Arm@rium Universitatis Leodiensis. The study further addresses the technical and strategic complexities involved in integrating DONum with ULiège's library management system (Alma) and discovery interface (Primo), including the consistency of the metadata, enhancements of the user interface, and development of a dedicated Primo view, Legito, for heritage materials. These integrations aim to streamline user experience, improve searchability, and maintain bibliographic coherence across platforms.

Keywords

Digitised heritage collections; DONum project; Alma library management system; Primo discovery solution; Integration; Cultural portal; Digital library

Description of Scientific and Historical Physics Instruments

Gislene Rodrigues da Silva

Increasingly, universities and research institutes have turned their attention to preserving their institutional memory and scientific–cultural heritage. In this context, university libraries play a strategic role that goes beyond storing and conserving books; they also engage in mediating, providing access to, and preserving various informational resources, including physical and digital documents and historical scientific objects.

Among these resources, teaching and research instruments stand out as representations of the material culture of science, reflecting pedagogical and investigative practices from different periods. The Professor Manoel Lopes de Siqueira Library, a graduate studies library within the Department of Physics at the Federal University of Minas Gerais (UFMG), recognised this relevance and developed an initiative for the identification, preservation, and exhibition of historical scientific objects used in the department's laboratories and teaching activities. Comprising approximately 50 items, such as temperature controllers, spectrometers, magnifying glasses, and variable resistors, this collection includes pieces dating from the 1940s to the 1990s, which are now considered obsolete due to scientific and technological advancements.

Although they are no longer used in experimental and educational activities, these objects constitute valuable sources for research in the history of science, physics education, and the preservation of academic heritage. Their disappearance could represent an irreparable loss to the memory of scientific and educational practices. The structured documentation of these objects through description and indexing processes is a fundamental strategy to ensure they are safeguarded and to communicate their value and history to future generations (Silva et al., 2016).

In this context, the library faces several challenges regarding this type of collection. The first concerns organisation and description, as there is a lack of specific standards in the literature that address scientific instruments. These objects do not belong to the group of informational resources with traditional bibliographic description formats and, thus,

require cataloguing with specific fields. Another issue is the absence of controlled vocabularies since the description requires technical terms specific to physics and the history of science. Furthermore, many instruments have incomplete documentation with unknown origins or functions, which makes cataloguing difficult.

The second challenge relates to preservation and conservation, as the collection is composed of various materials, many of which are fragile and require specific care. Natural degradation over time is also a factor, as the objects suffer from natural wear and tear. Furthermore, climate and humidity play a role since the library lacks a climate-controlled environment and is located in a tropical climate with high temperature variation and humidity; these conditions accelerate the deterioration process of the instruments.

The third challenge is related to management. Few specialised staff members, such as conservators and museologists, are available for these kinds of instruments. Finally, funding is absent, with scarce resources for inventory, restoration, and outreach activities.

Considering that librarianship has historically focused its efforts on the representation of textual resources, this article presents a proposal for a descriptive record form adapted for historical scientific objects, developed by the Library of the Department of Physics at UFMG. The initiative is based on the analysis of experiences from other institutions with similar collections and on the guidelines found in the scientific literature on metadata and cultural heritage items' descriptions. Although the structure of the form is based on the VRA Core standard and the descriptive models used by Harvard and the National Museum of Natural Sciences (*Museo Nacional de Ciencias Naturales* – MNCN), this article discusses the reasons behind these choices and the limitations encountered. Additionally, it explores the possibility of adapting or combining these models with other standards that are more specific to the scientific context. This article aims to support other institutions with similar collections in replicating and adapting the form to their contexts.

Literature Review

Information and communication technologies have transformed various sectors of society, including libraries, which have been able to make their catalogues and collections available online. However, for this to happen, it is necessary to use standards for the description of information

resources. Among these standards, metadata plays a key role in enabling the creation, organisation, description, identification, and access to information resources (Ferreira et al., 2018). The use of metadata is grounded in the traditional activity of cataloguing in libraries, aiming to describe informational resources to make them unique among other existing materials and provide various ways of access so that the user can retrieve them in an informational system environment, whether conventional or digital, as noted by Formenton et al. (2018).

Among the functions of metadata, the following can be highlighted (Iannela & Waugh, 1997): presenting the meaning of data, allowing the data to be located, identifying if the data meets the need, preventing certain inappropriate uses, retrieving and accessing copies of the data, assisting in the interpretation of the data, identifying the conditions of use, presenting information on the history and trajectory of the data, highlighting the author or owner of the data, showing connections to other resources, and controlling and managing the data.

Among the types of metadata, five categories can be highlighted (Senso & de la Rosa Piñero, 2003):

1. Administrative: Administrative metadata is used for the management and administration of information resources, such as information acquisition and version control.
2. Descriptive: This type of metadata is used to represent informational resources, such as catalogue records and user annotations.
3. Preservation: Preservation metadata focuses on preserving informational resources. Examples include metadata that indicates the conditions for using physical resources and the actions taken to preserve physical or digital versions of a resource.
4. Technical: Technical metadata is related to how the systems or metadata behave. Examples include resource format and hardware and software documentation.
5. Usage: This type of metadata is related to the level and type of use made of the resources. Examples include information about resource versions and content reuse.

Currently, there are various metadata standards. Examples include Dublin Core, EAD, METS, MODS, PREMIS, and VRA Core. A metadata standard can be defined as a set of specifications for describing informational content. These standards are considered formal structures,

also known as metadata schemes, which are sets of defined elements aimed at describing a specific type of informational resource. From this perspective, a set of metadata elements consists of two fundamental aspects. The first aspect, semantics, refers to the meanings and definitions of the elements and their possible refinements. The second aspect is content, which refers to the guidelines on what values should be assigned to these elements and how this assignment should be done. Therefore, for each element defined in a standard, guidelines are established on how content should be created or recorded, such as by identifying the main title of a resource and date and time formats and establishing what values can be used, whether through controlled vocabularies or data extraction directly from the document (Formenton et al., 2018).

Dublin Core is a metadata standard that, in its simple version, consists of 15 elements aimed at facilitating the discovery of electronic resources. Originally, this standard was designed for the description of web resources by their creators; however, over time, it has attracted the attention of formal communities such as museums and libraries (Weibel, 2005). The 15 elements of the simple version are described as follows by Weibel (2005):

1. Title: The name given to the resource by the creator or publisher.
2. Creator: The person(s) or organisation(s) primarily responsible for creating the intellectual content of the resource.
3. Subject: The topic of the resource, namely keywords or phrases that describe the subject or content of the resource, including controlled vocabularies or classification schemes.
4. Description: A textual description of the content of the resource, including abstracts for document-like objects or content descriptions for visual resources.
5. Publisher: The entity responsible for making the resource available in its present form, such as a publisher, university department, or corporate entity.
6. Contributor: Person(s) or organisation(s) who made significant intellectual contributions to the resource but whose contribution is secondary to those in the creator element (e.g. editors, transcribers, and illustrators).
7. Date: The date the resource was made available in its present form.
8. Type: The category of the resource, such as homepage, novel, poem, working paper, technical report, essay, or dictionary. It is expected that the type element will be chosen from an enumerated

list of types.

9. Format: The data representation of the resource, such as text/html, ASCII, Postscript file, executable application, or JPEG image.
10. Identifier: A string or number used to uniquely identify the resource. Examples include URLs and URNs (when implemented). Other globally unique identifiers, such as ISBNs, are also candidates for this element.
11. Source: The work, either print or electronic, from which this resource is derived, if applicable.
12. Language: The language(s) of the intellectual content of the resource.
13. Relation: Relationship to other resources. This element is intended to express relationships among resources that have formal relationships with others but exist as discrete resources themselves.
14. Coverage: The spatial and temporal characteristic of the described resource.
15. Rights: A link to a copyright notice, a right-management statement, or a service that would provide such information dynamically.

The qualified version of Dublin Core includes three additional elements, namely audience, provenance, and rights holders (Formenton et al., 2018).

The Encoded Archival Description (EAD) schema was developed in 1993 through a project by the University of California, Berkeley (Formenton & Gracioso, 2022). It is an XML-based standard used to encode archival finding aids. Currently, the EAD is maintained by the Technical Subcommittee for Encoded Archival Standards of the Society of American Archivists, in collaboration with the US Library of Congress (SAA Technical Subcommittee for Encoded Archival Standards, 2023). The EAD is currently in version EAD3 and contains various elements and attributes organised into sections that maintain the structure of archival description. This schema allows for contextualised descriptions of resources, helping users categorise and locate the information (Barbedo et al., 2007).

The METS standard was developed from a project called Making of America II (MOA2), which resulted in a metadata encoding system for textual and image materials. This system used XML to establish a standard for organising descriptive, administrative, and structural metadata. METS allows for the management of digital objects in repositories and the transfer of data between institutions or users (Formenton et al., 2018).

The Metadata Object Description Schema (MODS) was launched in 2002 by the Library of Congress. It is an XML-based bibliographic metadata standard intended for digital library objects. This schema uses textual elements and is, therefore, more accessible (Formenton et al., 2018). Currently, MODS is in version 3.8 and can be used for various purposes, especially in libraries (Library of Congress, 2022). From the perspective of digital preservation, three relevant elements include source information, which provides the provenance of the digital object; related item, which aims to analyse connections to other resources; and access conditions, which records usage restrictions or permissions. These fields help ensure the authenticity, integrity, and traceability of digital objects (Formenton et al., 2018).

This study considers scientific instruments as three-dimensional images, and to prepare the description sheet, it uses the standards applied for image description. Among these standards is the VRA Core, a data standard used to describe works of visual culture. This metadata standard facilitates a common language among those who manage artistic assets and establishes a common foundation for those who observe art (Martynovich, 2024). The standard is hosted by the Network Development and MARC Standards Office of the Library of Congress in partnership with the Visual Resources Association (Visual Resources Association, n.d.). The VRA Core can be viewed as an extension of the Dublin Core but with a focus on image resources, particularly works of art. This standard distinguishes between original works (e.g. paintings, sculptures, and architectural works) and reproductions of artworks (e.g. slides and digital photographs). The latest version of VRA Core is 4.0 and is internationally recognised as the only metadata standard created specifically to describe images and cultural objects (Ferreira & Santos, 2013; Mandal, 2018).

In VRA Core, three different types of description are presented: Work, Image, and Collection. The 'Work' category covers events or objects of cultural production, for example, buildings, vases, paintings, and performances. The 'Image' category refers to the visual representation of the object or event, such as a digital image of a work of art or a photograph of a building. The 'Collection' category allows the cataloguing of groups of information resources, including images. In the context of VRA Core, 'elements' correspond to metadata and can be compared to fields in a database. 'Sub-elements' are elements that have a hierarchical relationship with the main elements. Finally, 'attributes'

qualify or establish relationships between the metadata of different elements or sub-elements (Ferreira et al., 2018).

VRA Core 4.0 is expressed in XML, which allows it to be used in different software. Additionally, it supports the use of attributes and the hierarchical structuring of metadata (Ferreira & Santos, 2013). These elements are detailed in Table 1.

Table 1 – Main elements of the VRA Core. Source: Martynovich, 2024.

VRA Core 4.0 Element	Description
Title	Title given to the work
Agent	Individual, group, or corporate body that has contributed to the design, creation, production, etc. of the work; terms that describe the work
Description	Free-text note about the work that gives additional information not in other categories
Style period	Defined style, historical period, school, or movement whose characteristics are represented in the work
Date	Date associated with the work
Work type	Specific type of work, collection, or image being described in the record
Material	The substance of which the work is composed (e.g. oil paint, bronze, or graphite)
Rights	Information about the copyright status of the work
Source	Reference to the source of information recorded about the work
Textref	Terms describing the relationship between the work and a related work; a unique reference to the resource
Cultural context	Name of the culture, people, or country with which the work has been associated
Location	Geographic location or repository whose boundaries include the work
Measurements	Dimensions of the work

State edition	Identifying number or name assigned to the edition of a work that exists in more than one format

Concerning historical scientific objects, an example of an institution with a collection is Harvard University. This institution makes the collection available online to provide greater access to these objects and records. The latest generation includes the electronic component called Waywiser, which allows online visitors to browse the collection and search for information about the items (Harvard University, n.d.). The collection began with the initiative of David Pingree Wheatland, who observed that the instruments discarded on the premises of the university's Physics Department were objects he had seen in photographs from his collection of rare books. Over time, Wheatland formed this collection of historical objects that have great scientific relevance (Harvard University, n.d.). The descriptive record from Harvard for scientific objects originated from the work developed by university museums and academic libraries at Harvard University. The main objective was to create a standardised description for this type of informational resource, enabling these materials to be preserved and made accessible. The record was developed out of the need to provide detailed descriptions of historical scientific instruments belonging to the collections of the Collection of Historical Scientific Instruments (CHSI) at Harvard University (Harvard University, n.d.). Regarding the description of the collection, research conducted in the university's online catalogue revealed that the collection uses the description fields presented in Table 2.

Table 2 – Elements used in the Harvard collection of historical scientific objects. Source: Prepared by the author.

Havard Collection of Historical Scientific Objects	Description
Date	Work manufacturing date
Inventory number	Work inventory number
Classification	Work name
Subject	Subject to which the object refers
Maker	Who created the work

Cultural region	Cultural region of the work
Place of origin	Location of origin of the work
City of use	City that used the work
Dimensions	Dimensions of the work
Material	Work material
Bibliography	Bibliography on the work
Description	Work description
In collection(s)	Collection the object belongs to
Signed	Signature present on the work
Inscribed	Inscription present on the work
Function	Function of the work
Historical attributes	Historical information about the work
Primary sources	Primary sources on the work
Published references	References used in the object research

Another example of an institution that developed its own cataloguing system is the MNCN in Madrid. The MNCN has a collection of historical scientific instruments consisting of various types of objects dating back to the 18th century, which were a part of the Real Gabinete de Historia Natural. This museum adopted a cataloguing system adapted to the collection, and the description comprises 27 fields that provide information about the identification of the item, namely number, name, location, provenance, current state of conservation, and future maintenance needs. Moreover, this description allows for the management of restorations and the loan service for exhibitions or other institutional needs. The knowledge of the pieces is also extended to the incorporation of bibliographic data, both specific and general for each item, and the corresponding archival references (Osuna et al., 2022). Below, in Table 3, the museum's description fields are presented.

Table 3 – Elements used in the MNCN collection of historical scientific objects. Source: Prepared by the author.

MNCN Collection	Description
Number in the catalogue	Scientific instrument code in the institution's catalogue
Denomination	Name of the scientific instrument
Family	General typology of the instrument in a hierarchical classification aimed at grouping instruments with the same characteristics or functions
Provenance	City, country, or region where the instrument was manufactured
Acquisition method	Origin and acquisition history of the scientific instrument
Conservation	State of conservation of the scientific instrument
Identification	
Manufacture date	Manufacture date of the scientific instrument
Constructor	Creator – the person who conceived the scientific instrument
Serial number	Serial number on the scientific instrument
Materials	Materials used in the manufacture of the scientific instrument
Dimensions in cm	
Height	Height of the scientific instrument
Width	Width of the scientific instrument
Depth	Depth of the scientific instrument
Additional information	
Inscriptions	Marks, texts, numbers, signatures, or any other written elements
Description	Detailed presentation of the object
Accessories	Additional or complementary items that accompany

	the scientific instrument
Other catalogue number	Inventory numbers or identifiers associated with the scientific instrument
Notes	Record of additional information, observations, or important comments

An important initiative in the management and organisation of scientific instruments was the development of the Thesaurus of Scientific Instruments in the Portuguese Language, which was carried out between 2006 and 2013 by a network of institutions from Portugal and Brazil. This initiative was coordinated by the National Museum of Natural History and Science, part of the University of Lisbon, and by the Museum of Astronomy and Related Sciences (MAST) in Rio de Janeiro, affiliated with the Interuniversity Centre for the History of Science and Technology (Centro Interuniversitário de História das Ciências e da Tecnologia, n.d.). However, the official website of the thesaurus is no longer available for consultation.

Methodology

This section describes the methodological procedures adopted for the development of the descriptive record of the historical scientific instrument collection of the Library of the Department of Physics at UFMG. The research follows a qualitative, applied approach with a descriptive objective, focusing on the organisation and representation of information on scientific objects in the context of a library that houses a diverse collection.

The methodology was structured into five main stages: (1) review of the scientific literature on existing metadata models; (2) analysis of descriptive models used in different institutional and disciplinary contexts; (3) selection of the most suitable descriptive elements for the characteristics and needs of the collection in question; (4) development of a descriptive record proposal adapted to the library's collection; and (5) application of the descriptive record to instruments in the library.

For the initial stage, three referential models with recognised applications in the description of cultural, scientific, and artistic objects were selected: the VRA Core, which is widely used for describing visual works and objects of historical value; the descriptive record of the

Department of the History of Science at Harvard University, which is specifically focused on scientific instruments; and the taxonomic record of the MNCN, which offers a detailed structure for the classification of natural and scientific objects.

The choice of these models was justified by their relevance in handling collections similar to that of the Physics Library, their diverse approaches (visual, scientific, and museological), and the richness of their descriptive elements. The comparison between these standards made it possible to identify convergent and divergent categories with complementary functions, enabling a critical analysis of the most appropriate fields for the reality of the library's collection.

Table 4 presents a comparative analysis of the three models, highlighting elements with direct correspondence or functional similarities. Based on this analysis, the most relevant fields were selected for the construction of the final descriptive record, aiming to ensure representativeness, standardisation, and usability of the information by library users and the scientific community.

Table 4 – Comparison between similar elements in the VRA Core, the Harvard Historical Science Objects Collection, and the MNCN collection. Source: Prepared by the author.

VRA Core	Harvard	MNCN	Comparative Analysis
Title: Title given to the work	Classification: Name of the instrument	Denomination: Name of the scientific instrument	Both are used to identify the object, but VRA Core uses 'Title', whereas Harvard uses 'Classification'. Moreover, in the context of the MNCN, the field used for identifying the object is 'Denomination'.
Agent: Individual, group, or corporate body that has contributed to the design, creation, production, etc. of the	Maker: The person who created the instrument	Constructor: Creator – the person who conceived the scientific instrument	Both standards use this field to refer to the creator or manufacturer of the object, but VRA Core uses 'Agent', whereas Harvard uses 'Maker'. Similarly, in the context of MNCN, the field used to refer to the creator or manufacturer is 'Constructor'.

work; terms that describe the work			
Description: Free-text note about the work that gives additional information not in other categories	Description: Instrument description	Description: Detailed presentation of the object	Both elements provide a detailed description of the object and serve similar functions. Similarly, in the context of MNCN, the field used for the description is also 'Description', but it may emphasise a more detailed presentation of the object.
Style period: defined style, historical period, school, or movement whose characteristics are represented in the work	Cultural Region: Cultural region of the instrument	Not applicable	VRA Core emphasises style and historical period, while Harvard focuses on the cultural region associated with the object.
Date: Date associated with the work	Date: Date of instrument fabrication	Manufacture date: Date of creation	Both standards provide the relevant date for the object. In the context of MNCN, the field used is 'Manufacture date', emphasising the creation of the object. The description of the Harvard collection also includes a date, but it refers to the instrument's manufacturing context.
Work type: Identifies the specific type of work, collection, or image being described in the record	Function: Instrument function	Family: Typological group with shared features	The 'Work type' field in VRA Core can encompass both the 'Type' and 'Function' of the object, whereas Harvard uses 'Function' to describe the utility of the object. In the context of MNCN, the field used is 'Family', which refers to the typological group with shared features.

Material: The substance of which the work is composed (e.g. oil paint, bronze, or graphite)	Material: Instrument material	Materials: Materials used in manufacturing	Both standards describe the material the object is made of. In the context of MNCN, the field used is 'Materials', which refers to those materials used in the manufacturing of the object.
Rights: Information about the copyright status of the work	Bibliography: Bibliography about the instrument	Notes: Additional information	While both VRA Core and the Harvard classification provide fields that contribute to contextualising the object, 'Rights' in VRA Core refers specifically to the copyright status or legal permissions associated with the object, whereas 'Bibliography' in the Harvard model offers academic references or sources that relate to the object's historical or scientific significance. Similarly, in the context of MNCN, the field used is 'Notes', which allows for the inclusion of additional information about the object.
Source: Refers to the source of information recorded about the work	Primary sources: Primary sources about the subject	Not applicable	Both standards address sources of information, with 'Source' in VRA Core referring more generally to 'Primary Sources', which indicate the sources used to research the object.
Textref: Terms describing the relationship between the work and another related work; a unique reference to the resource.	Inscribed: Inscription present on the object.	Inscriptions: Marks, signatures, labels	'Textref' in VRA Core identifies the relationship between the described work and another related work, functioning as a reference to contextual or derivative connections. On the other hand, 'Inscribed' in the Harvard model refers specifically to physical

			inscriptions found on the object itself, such as labels, engravings, or handwritten notes. Similarly, in the context of MNCN, the field used is 'Inscriptions', which refers to marks, signatures, and labels present on the object.
Cultural context: The name of the culture, people, or country with which the work has been associated	Cultural region: Cultural region of the object	Not applicable	Both standards describe the cultural context. In the VRA Core, 'Cultural context' includes cultural and historical associations. 'Cultural Region' refers to the region of the object.
Location: Geographic location or repository whose boundaries include the work	City of use: The city that used the object	Provenance: Manufacturing place	'Location' in VRA Core refers to the location or repository, while 'City of use' in Harvard is more specific to the city where the object was used. Similarly, in the context of MNCN, the field used is 'Provenance', which refers to the place where the object was manufactured or originally created.
Measurements: Dimensions of the work	Dimensions: Dimensions of the object	Dimensions: Height, width, depth	Both standards provide the physical measurements of the object. Similarly, in the context of MNCN, the field used is 'Dimensions', specifying the height, width, and depth of the object.
State edition: The identifying number or name assigned to the edition of a work that exists in more	Signed: Signature present on the object	Inscriptions: Marks, texts, numbers, signatures, or any other written elements	'State edition' in VRA Core refers to the specific version or edition of a work, which is especially relevant when a work exists in multiple forms or has undergone changes over time. In

than one form			contrast, 'Signed' in the Harvard model indicates the presence of a signature physically inscribed on the object, usually by the creator or manufacturer. Similarly, in the context of MNCN, the field used is 'Inscriptions', which encompasses all marks, texts, numbers, signatures, or any other written elements on the object.
Technique: Production processes, techniques and methods incorporated in the work fabrication	Historical attributes: Historical information about the object	Not applicable	The 'Technique' field in VRA Core refers specifically to the production processes, materials, and methods used in the creation or fabrication of the object. On the other hand, 'Historical Attributes' in the Harvard model encompasses broader contextual information, including the historical background, provenance, and usage of the object.
Work, collection, or image: A record is described as a work, a collection or an image	In collection(s): Collection to which the object belongs	Other catalogue number	'Work, collection, or image' refers to the record type, while 'In collection(s)' specifies the object collection. 'Other catalogue number' provides an additional identifier for the object within its collection.

Table 4 shows that some elements presented across the three models differ in terminology and conceptual focus. The comparison between the VRA Core, Harvard Historical Objects, and MNCN systems proved relevant and necessary. The three instruments present distinct approaches: the VRA emphasises stylistic aspects, as it is linked to images and works of art; the Harvard model has a functional and historical perspective; and the MNCN model has a taxonomic approach. Despite these differences, they all share the common goal of documenting,

preserving, and contextualising scientific and historical objects. The comparative analysis facilitated identifying the elements present in each model from a perspective of convergences and gaps between the standards, which had to be adapted to the needs of the collection housed in the physics library.

After comparing the standards, the fields that could be used by the Library of the Physics Department at UFMG were identified. The three standards offer relevant and complementary elements for cataloguing and managing informational resources. Each of the selected fields provides a description aligned with the library's needs, allowing for the organisation, preservation, and access to the collection. Table 5 presents the fields selected and created by the library based on the three chosen models.

Table 5 – Proposed description model for the Physics Library at UFMG. Source: Prepared by the author.

Metadata	Content
Number in the catalogue	The unique identification of the item within the institution; facilitates internal tracking
Title / Classification	Identifies the name of the object
Agent	Creator of the object
Maker	Manufacturer of the object
Description	Describes the object in general terms
Subject	Identifies the area to which the object belongs
Date	Displays the production date of the object for historical studies
Work type / Function	Describes the function of the object
Material	Identifies the materials used, important for conservation and technical analysis
Rights / Bibliography	Identifies references used for queries
Location / City of use	Indicates the location where the object is stored and the laboratory where it was used
Lead researcher	Identifies the researcher who used the equipment

Measurements / Dimensions / Weight	Displays the physical measurements of the object and weight
Accessories	Items that accompany the main object (e.g. cables, lenses, cases); essential for complex objects
Acquisition method	Allows tracking of how the item entered the collection (donation, purchase, exchange); relevant for asset management
Conservation	Indicates the current physical condition; essential for preventive conservation and curatorship
Work, collection or image / In collection(s)	Identifies which collection the object belongs to
Inscriptions	Texts, signatures, marks, or numbers on the object – useful for historical or technical study
Keywords	For keywords that give an overview or are linked to the object
Notes	Free space for additional observations that do not fit into formal fields

For the development of the description model adopted in the Physics Library at UFMG, criteria that encompassed both traditional bibliographic organisation and the specificities of the scientific and instrumental objects in the collection were considered. The choice of fields was made from the perspective of the need for a complete and functional representation of the items, ensuring their identification, historical, technical, and material contextualisation and enabling strategies for preservation and information retrieval.

The field 'Number in the catalogue' was included for its importance in the unique identification of each item within the institution, allowing effective asset control and internal tracking. 'Title/Classification' serves the basic function of naming and classifying the object, facilitating its location and consultation. The fields 'Agent' and 'Maker' record, respectively, the intellectual creator and the manufacturer of the object, contributing to the attribution of authorship and the contextualisation of technical production.

The 'Description' field provides a general description of the object, while 'Subject' situates it within a thematic area, contributing to the

organisation of the collection. The 'Date' field is relevant for historical studies and technological evolution analysis. The 'Work type/Function' field clarifies the original function of the object, essential for its understanding in educational or research contexts.

Considering material aspects, 'Material' and 'Measurements/ Dimensions' fields are fundamental for both the conservation and planning of storage and display. The library is located on the fourth floor, and the weight of a scientific object must be known to ensure the safety and structural integrity of the building. The 'Rights/Bibliography' records sources of consultation and any legal restrictions on use or reproduction. 'Location/City of use' identifies where the object was used or is stored, providing context for its institutional use.

'Lead Researcher' highlights the connection of the object to specific researchers, useful for the history and identification of academic or experimental trajectories. 'Accessories' allows for the recording of complementary parts, common in scientific instruments. 'Acquisition method' reveals how the item was incorporated into the collection, which can include information regarding the researcher or laboratory that donated it to the library. Moreover, 'Conservation' documents the item's current physical state, which is essential data for curation and preservation.

The association of the object to a larger set or collection is covered by the 'Work, collection, or image/In collection(s)' field. 'Inscriptions' allows for the recording of marks, texts, or signatures present on the object, elements that often carry valuable information about its origin or use. 'Keywords' was included to facilitate thematic indexing and retrieval in digital systems. To describe the keywords, a controlled vocabulary used by the UFMG Library System is applied. Finally, the 'Notes' field provides a free space for additional observations, ensuring descriptive flexibility and the inclusion of information that does not fit into formal fields.

This set of fields, therefore, seeks to meet both the demands of an efficient informational system and the care required by the technical and historical nature of the Physics Library's collection at UFMG, integrating heritage, academic, museological, and library sciences aspects.

Results

This section presents the results of applying the model for describing scientific and historical objects in the Physics Library. As a sample, the repeating theodolite (Figure 1) and the microdensitometer for astronomical plates (Figure 2) were selected and described (Tables 6 and 7).

Figure 1 – Repeating Theodolite. Credits: Lídia Maria de Andrade.

Table 6 – Application of the description model to an object from the UFMG Physics Library. Source: Prepared by the author.

Metadata	Content
Number in the catalogue	Code of the UFMG Library System 112802530; university asset number 9856045
Title / Classification	Repeating theodolite
Agent	Jonathan Sisson (19__) and Ignácio Porro (1935)
Maker	P. Gautier

Description	As the name suggests, the repeating theodolite was designed to facilitate the application of the method for measuring angles by repetition. The body of the theodolite rotates around two independent axes, one fixed and the other movable (double axis). The movable circle can be attached to the fixed one using pressure screws. Its horizontal limb can be locked in any position, allowing the measurement of single, double, and triple angles, and so on, due to the possibility of rotating the theodolite horizontally and, thus, marking the angle corresponding to this rotation. The device can also rotate with the limb locked, without marking any angle.
Subject	Astronomy, astrophysics, physics, geodesy, engineering, topography
Date	Date not identified
Work type / Function	Optical instrument used to measure angles, both horizontal and vertical, in direct and indirect measurements of distances
Material	Brass (external parts), steel (external components), and glass (lenses)
Rights / Bibliography	Universidade Federal do Rio de Janeiro. (2010). *Coleção de instrumentos científicos do Observatório do Valongo*. UFRJ. Museu de Astronomia e Ciências Afins. (n. d.). *Teodolito*. http://site.mast.br/multimidia_instrumentos/teodolito_instrumento.html
Location / City of use	Astronomy Laboratory/UFMG; Biblioteca do Departamento de Física/UFMG
Lead researcher	Used by Prof. Renato Las Casas in the Astronomy laboratory of the Department of Physics (UFMG)
Measurements / Dimensions / Weight	Height: 0.30 m; length: 0.32 m; width: 0.23 m; weight: 5 kg
Accessories	Comes with a lens that detaches from the structure of the repeating theodolite
Acquisition method	Donation made by the Astronomy Laboratory of the Physics Department at UFMG; equipment donated by Prof. Renato Las Casas
Conservation	Good condition, although the paint is chipped and

|	one of the lenses has detached from the structure
Work, collection or image / In collection(s)	Collection of scientific and historical objects from the Department of Physics at UFMG – Series: Astronomy
Inscriptions	No inscriptions
Keywords	Theodolite, repeater, measuring instrument, geodesy, topography, horizontal angles, vertical angles, astronomy, navigation, geographic survey, precision, optics, civil engineering, cartography, alidade, graduated circle, triangulation, spirit level, scientific instrument, 19th century (based on the controlled vocabulary used by the UFMG Library System)
Notes	The repeating theodolite was a crucial instrument for astronomical and geodetic measurements during the 19th and early 20th centuries. It was widely used in topographic surveys and navigation, especially in the context of early modern astronomy and geodesy. The instrument was part of the teaching and research tools of the Astronomy Laboratory at UFMG, contributing to scientific studies conducted by Prof. Renato Las Casas and others. Currently, the object is used in guided tours at the library, where its significance in the field of physics is explained. Furthermore, visitors have the opportunity to view other objects through the theodolite's lens, providing a practical and interactive experience.
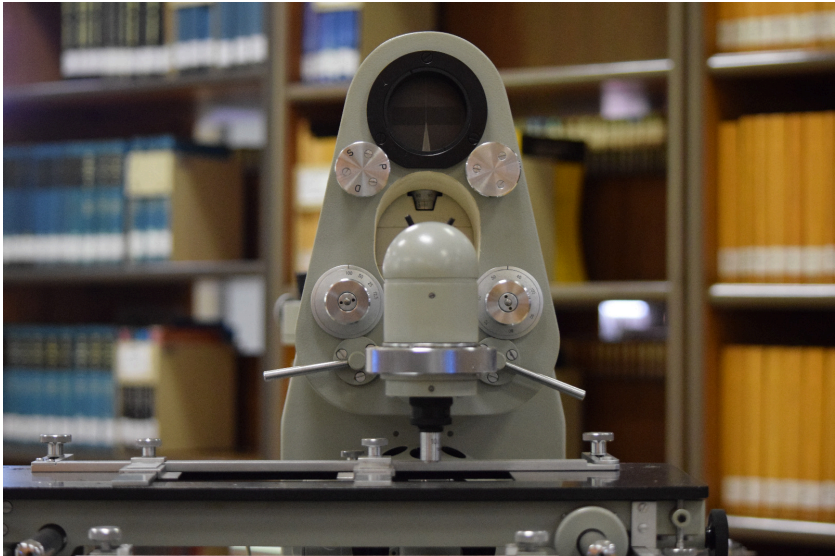
Figure 2 – Microdensitometer for astronomical plates. Credits: Lídia Maria de Andrade.

Table 7 – Application of the description model to an object from the UFMG Physics Library. Source: Prepared by the author.

Metadata	Content
Number in the catalogue	Code of the UFMG Library System: 112802531; university asset number: 9813012
Title / Classification	Microdensitometer for astronomical plates
Agent	Harlan True Stetson's contribution in 1911
Maker	Carl Zeiss.
Description	The microdensitometer for astronomical plates is an instrument that allows precise analysis of the optical density of photographic plates used to record images.
Subject	Astronomy
Date	20th century
Work type / Function	Ascorecord plate reader, sidereal plate comparator, blink comparator, and microdensitometer for astronomical plates

Material	Mostly comprised of metal; also has a lens
Rights / Bibliography	Universidade Federal do Rio de Janeiro. (2010). *Coleção de instrumentos científicos do Observatório do Valongo*. UFRJ. Brazil Astronomy. (n.d.). *Fotografia*. Retrieved April 14, 2025, from https://brazilastronomy.wordpress.com/fotografia/
Location / City of use	Astronomy Laboratory/UFMG; Biblioteca do Departamento de Física/UFMG
Lead researcher	Used by Prof. Renato Las Casas in the Astronomy laboratory of the Department of Physics (UFMG)
Measurements / Dimensions / Weight	Height: 0.52 m; length: 0.42 m; weight: 50 kg
Accessories	Does not have any accessories
Acquisition method	Donation made by the Astronomy Laboratory of the Physics Department at UFMG
Conservation	Good condition, but does not work and is obsolete
Work, collection or image / In collection(s)	Collection of scientific and historical objects from the Department of Physics at UFMG – Series: Astronomy
Inscriptions	No inscriptions
Keywords	Astronomical photography, photometry (astrographic plates)
Notes	The instrument is used in research in the field of Astronomy at UFMG. Currently, the instrument is in the library as a piece that is part of the Scientific and Historical Physics Instrument collection.

During the development of the descriptive record for the historical scientific instruments of the Physics Department Library at UFMG, it was possible to research and identify different metadata standards across various contexts. Throughout this experience, it became clear that although the literature presents models with distinct approaches – such as artistic and bibliographic – in practice, institutions often use customised models adapted from existing ones. Significant convergences were identified in creating this record and through bibliographic research and consultation with institutions holding similar types of collections, which

can be explored complementarily in each model used. Adapting the categories to the reality of the collection required a critical perspective on the specificities of the holdings, valuing the technical aspects of the objects and their historical and scientific value and the trajectory of the experiment from the perspective of its past use and current presence in the library. Moreover, the process reinforced the relevance of standardised practices in information organisation to ensure the preservation, accessibility, and dissemination of scientific heritage.

Another important insight gained during the preparation of the descriptive record was the recognition of the relevance of interdisciplinarity. Describing the instruments required knowledge of physics, astronomy, museology, and library science, highlighting the need for collaboration between different fields to preserve and contextualise scientific objects.

Finally, the practical application of the model confirmed its potential as an educational tool, as the description of the instruments, including explanations of their function and history, supports the scientific outreach already taking place in the library through guided tours and via social media, connecting the past and present of research.

In summary, this study reinforced the idea that detailed and accessible documentation of historical instruments not only preserves their memory but also enhances their usefulness for teaching, research, and outreach.

Conclusion

This study confirmed the effectiveness of the descriptive model developed for historical scientific objects in the Physics Department Library at the Federal University of Minas Gerais (UFMG). The model was based on a comparative analysis of three metadata standards – VRA Core, the Harvard model, and the MNCN system – and integrated elements from each one to address the specific historical, informational, and material characteristics of the collection.

Applied to objects such as the repeating theodolite and the microdensitometer, the proposed model enabled detailed and contextualised documentation, capturing technical specifications, historical significance, provenance, and educational function. This level of description enhances the organisation, preservation, and dissemination of institutional memory and scientific heritage.

Furthermore, the model is valuable for enhancing information interoperability and retrieval, promoting standardisation in the cataloguing of non-bibliographic materials. It supports the broader objective of integrating scientific cultural heritage into the library and archival systems, offering the potential for reuse in digital repositories, online exhibitions, and educational outreach. In this regard, the inclusion of elements such as controlled vocabularies, acquisition history, conservation status, and researcher attribution enriched the model's descriptive framework and aligned with best practices in digital curation and museology.

The development process underscored the necessity of interdisciplinary collaboration, drawing on knowledge from library and information science, museology, physics, and the history of science. It also highlighted the institutional challenges that affect the sustainability of such initiatives, including limited resources and the lack of specialist personnel for conservation and heritage management.

In light of these outcomes, the model can serve as a reference for other institutions managing similar collections. Future research should focus on refining and applying the model to broader collections, testing its adaptability across different scientific domains and institutional contexts. Moreover, there is value in exploring its integration into metadata standards, fostering a more unified approach to the preservation and visibility of scientific and academic heritage.

Ultimately, this work affirms that a robust and context-sensitive descriptive framework is essential for the long-term safeguarding, accessibility, and appreciation of historical scientific instruments. This framework not only preserves the material legacy of scientific endeavour but also reinforces the role of libraries as stewards of cultural and scientific heritage.

References

Barbedo, F., Corujo, L., Castro, R., Faria, L., Ramalho, J. C., & Ferreira, M. (2007). *RODA: Repositório de objectos digitais autênticos*. In 9.º Congresso Nacional de Bibliotecários, Arquivistas e Documentalistas, Ponta Delgada, Portugal. *Bibliotecas e arquivos: informação para a cidadania, o desenvolvimento e a inovação: actas* [CD-ROM]. Associação Portuguesa de Bibliotecários, Arquivistas e

Documentalistas. https://repositorium.sdum.uminho.pt/handle/1822/6330

Centro Interuniversitário de História das Ciências e da Tecnologia. (n.d.). *Thesaurus de instrumentos científicos em língua portuguesa*. Retrieved April 14, 2025, from https://ciuhct.org/investigacao/thesaurus-de-instrumentos-cientificos-em-lingua-portuguesa

Ferreira, S. L., Macambyra, M. M., & Lima, V. M. A. (2018). Imagens interoperáveis: uso do VRA Core e da estrutura IIF na construção de bibliotecas digitais. *Informação & Tecnologia*, *5*(1), 4–17. https://doi.org/10.22478/ufpb.2358-3908.2018v5n1.38194

Ferreira, S. L., & Santos, M. dos. (2013). *Elementos da descrição de imagens de arte em ambiente eletrônico: considerações sobre o Padrão VRA Core 4.0*. Communication presented at the 9th Encontro Internacional de Catalogadores, Rio de Janeiro, Brazil. https://www.eca.usp.br/acervo/textos/002706812.pdf

Formenton, D., Castro, F. F. de, Gracioso, L. de S., Furnival, A. C. M., & Simões, M. da G. de M. (2018). Los estándares de metadatos como recursos tecnológicos para la garantía de la preservación digital. *Biblios Journal of Librarianship and Information Science*, (68), 82–95. https://doi.org/10.5195/biblios.2017.414

Formenton, D., & Gracioso, L. de S. (2022). Padrões de metadados no arquivamento da Web: recursos tecnológicos para a garantia da preservação digital de websites arquivados. *RDBCI: Revista Digital de Biblioteconomia e Ciência da Informação*, *20*, e022001. https://doi.org/10.20396/rdbci.v20i00.8666263

Harvard University. (n.d.). *Collection of historical scientific instruments*. https://chsi.harvard.edu

Iannella, R., & Waugh, A. (1997). *Metadata: Enabling the Internet*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=1d525a53d9c34dca5ae029516eb21aaa8b4979c4

Library of Congress. (2022). *MODS version 3 user guidelines*. Retrieved April 14, 2025, from https://www.loc.gov/standards/mods/userguide/index.html

Mandal, S. (2018). Development of an Integrated VRA Core Framework for Libraries. *Library Philosophy and Practice*, Article 1890. https://digitalcommons.unl.edu/libphilprac/1890/

Martynovich, S. (2024). Toward an extended metadata standard for digital art. *Journal of Documentation*, *80*(2), 469–486. https://doi.org/10.1108/JD-07-2023-0126

Osuna Arias, M. C., Onrubia Chinarro, M., & Martín Albaladejo, C. (2022). *Catálogo de la colección de instrumentos científicos históricos*. Museo Nacional de Ciencias Naturales – CSIC. https://hdl.handle.net/10261/261135

Senso, J. A., & de la Rosa Piñero, A. (2003). El concepto de metadato: Algo más que descripción de recursos electrónicos. *Ciência da Informação*, *32*(2), 95–106. https://doi.org/10.1590/S0100-19652003000200011

Silva, S. M., da Silva, G. R., & Nunes, D. V. (2016). *Formação e gestão de coleção de instrumentos científicos do Departamento de Física – Instituto de Ciências Exatas da Universidade Federal de Minas Gerais / UFMG*. Paper presented at the 19th National Seminar of University Libraries (19º Seminário Nacional de Bibliotecas Universitárias), Brazil. Universidade Federal de Minas Gerais. http://hdl.handle.net/1843/44472

SAA Technical Subcommittee for Encoded Archival Standards. (2023). *Encoded archival description tag library. Version EAD3 1.1.2*. Society of American Archivists. https://www.loc.gov/ead/EAD3taglib/EAD3-TL-eng.pdf

Visual Resources Association. (n.d.). VRA Core: *A data standard for the description of images and works of art and culture. Library of Congress*. Retrieved April 14, 2025, from https://www.loc.gov/standards/vracore/

Weibel, S. (2005). The Dublin Core: A simple content description model for electronic resources. *Bulletin of the American Society for Information Science and Technology*, *24*(1), 9–11. https://doi.org/10.1002/bult.70

Abstract

This article aims to present a description model for historical physics objects, which was developed for the library of the Physics Department at the Federal University of Minas Gerais (Universidade Federal de Minas Gerais – UFMG), Brazil. The research adopted a qualitative approach with an applied nature and a descriptive objective, focusing on the organisation and representation of information related to scientific

objects in the context of a library with a diverse collection. The methodology involved a comparative analysis of three description models: the VRA Core, used to describe visual resources related to art; the description standard developed by the historical scientific objects collection at Harvard University; and the descriptive record from the *Museo Nacional de Ciencias Naturales* (MNCN) in Madrid, Spain. This study included a detailed analysis of the metadata fields present in the three models, identifying the relevant information from each one. Based on this analysis, the research proposed the adaptation of these models to meet the specific needs of the historical physics objects at UFMG, which reflect the department's teaching and research, thereby preserving its institutional memory. As a result, a hybrid description model was developed, combining elements from the VRA Core, which emphasises visual description, with those from the Harvard and MNCN models, which highlight the functionality and historical context of the instruments. The research also involved applying the model to an object from the library's collection. The findings show that its application contributes to a more comprehensive and contextualised description, supporting the preservation and retrieval of the informational object within an information system and assisting with guided tours and the dissemination of the collection through the library's social media channels. Furthermore, the model can serve as a reference for other libraries or information centres in the organisation and accessibility of scientific objects.

Keywords

Historical physics instruments; Memory preservation; Descriptive record; Metadata; Information representation; Universidade Federal de Minas Gerais

Part II

Structuring and Connecting
Heritage Data

Cultural Heritage Data @ SLSP: The Cases of the Connectome Project and the Swiss National Library

Rouven Schabinger and Nikol Stepan

SLSP and the Swiss Data Landscape

Swiss Library Service Platform (SLSP) was founded in 2017 by 15 higher education institutions and libraries in Switzerland.[1] SLSP aimed to consolidate the datasets of the six existing library consortia in Switzerland into a national platform, operate a centrally managed library system, and offer centrally managed services for libraries. Today, SLSP drives transformation for trustworthy information in Switzerland with around 500 libraries as part of the network, grouped in 31 so-called institution zones in Alma. In addition to traditional academic libraries, this network also includes the special case of patrimonial libraries – for instance, cantonal libraries.

Heritage institutions face different challenges when it comes to publishing open data. Since libraries often hold material such as archival records or images in addition to classic digitised texts, these boundaries are becoming increasingly blurred, and general questions arise around licensing, metadata, and APIs (Roued-Cunliffe, 2020, Chapter 3). Compared with the situation described in another study (Estermann, 2014), the dissemination of this data in Switzerland has made great progress in the last 10 years. In particular, data that is collected in libraries can nowadays be exposed in various ways. Some of the cultural data of Switzerland is exposed via repositories.[2] Furthermore, there is already a wide range of cultural and research data available in the common discovery platform swisscovery.[3] This data includes digital objects (over one terabyte) in the cloud library system Alma (Alma Digital), as well as external sources searchable via Primo VE. A large

1. https://slsp.ch
2. Search results for repositories in Switzerland: https://www.re3data.org/search?query=&countries[]=CHE
3. https://swisscovery.slsp.ch

portion of digital objects is preferably stored outside of Alma due to missing long-term storage options and control in Alma Digital.

Over two million records from over 60 institutional repositories, such as e-periodica,[4] are searchable in swisscovery through harvesting among around 40 million records of the libraries' holdings in total. Data can also be made available via portals or aggregators, including the Central Discovery Index (CDI), a large index for scholarly material worldwide provided by Clarivate | Ex Libris, and Europeana, for example. Another approach is to recognise that institutions in Switzerland also register their data via DOI agencies such as DataCite.[5] This registration makes them part of the persistent identifier (PID) graph and offers added value through the linkage of different entities, e.g. creators, institutions and events.

To do justice to this dynamic data landscape with which SLSP is dealing, several projects, such as a joint project called Connectome with Switch and another project with the Swiss National Library are presented below.

The Case of the Connectome Project

Open Data Navigator: Aggregating Swiss Data Sources

Switch operates the national research and education network of Switzerland. It is a member of GÉANT, a pan-European data network,[6] and collaborates with the European Open Science Cloud (EOSC). Switch is a strategic partner of SLSP and operates many services that SLSP utilises, such as cloud services (e.g. storage and computing), digital identity (edu-ID), and registry (.ch and .li).

A few years ago, Switch launched a project called Connectome preceded by several labs, for instance, one that addressed the handling of research data in social sciences and humanities (Hauf et al., 2021). This project is supported by Swissuniversities[7]. Connectome's objective is to 'promote reuse of open data from heterogeneous areas' and 'support [the] development of open data practices' (Switch, n.d.). To achieve this aim, it harmonises and links metadata through artificial intelligence from various Swiss sources into a knowledge graph. This data can come from

4. https://www.e-periodica.ch

5. https://commons.datacite.org

6. https://geant.org

7. https://www.swissuniversities.ch/en

administrations, archives, non-governmental organisations, galleries, libraries, museums, and other open data aggregators. Connectome's goal is for data to be findable, accessible, interoperable, and reusable, following the FAIR principles.

The aggregated data is presented to the public in two forms:

- Open Data Navigator: https://opendatanavigator.switch.ch/
- Switch Open Data API: https://opendatanavigator.switch.ch/api/graphql

Switch developed the Open Data Navigator, which acts as a national open data aggregator. The discovery experience is enhanced by recommendation systems based on artificial intelligence (language models) and semantic relationships among collected resources.
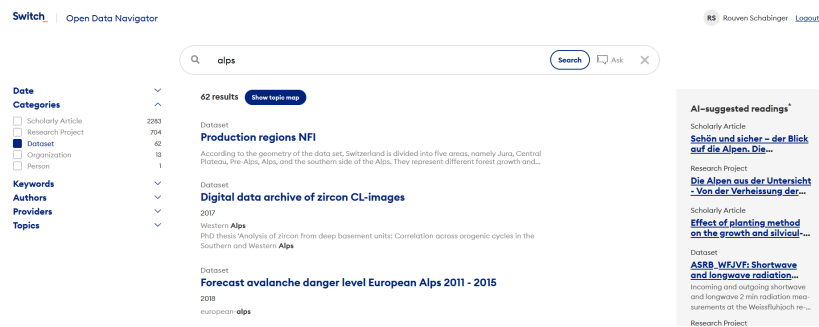
Figure 1 – Example Search in the Open Data Navigator.

The data can be filtered by facets, e.g. data types, keywords, or providers (Figure 1). There is also the option of displaying a topic map, which provides an additional visual introduction. Further sources are suggested on the right-hand side by using a k-nearest neighbour search for the query terms. The detailed view of a record contains the aggregated metadata and a link directly to the data or a landing page of the provider.[8]

---

8. A similar case from another Erasmus Staff Training Week participant exists with the platform ODIS, which also tries to bring together different resources from heritage institutions, although it has a more precise focus, namely the history and heritage of civil society in Flanders (Colla, 2025).

Connectome Meets Swisscovery: Finding Synergies

Connectome and swisscovery are two platforms that offer Switzerland access to literature and data. The question emerges as to what synergies arise between the two. The following abstract scenarios are conceivable:

- Connectome harvests swisscovery
- swisscovery integrates Connectome
- (artificially intelligent) linkage between swisscovery ⟷ Connectome
- A new portal

A connection with the research platform swisscovery can offer added value but also raises various questions: Which user stories should be considered for this approach? What does the technical integration look like, e.g. through GraphQL? What dependencies are there with Primo VE from Clarivate | Ex Libris?

A project was launched between SLSP and Switch to investigate these questions further as a proof of concept with the following mission statement:

> Key synergy is the guidance of swisscovery end-users to relevant resources related to their search criteria in the Swiss research landscape by means of visualisation and providing contextual information.

The project started in April 2024 and will last until the end of 2025, comprising roughly 200 hours of work. The project team consists of data and discovery experts from both institutions. In detail, the experts will try to familiarise ourselves with the end-user community. Building on this, a solution that adds value and is feasible will be specified. This solution will then be implemented as a prototype, evaluated, and documented. Currently, Phase I is underway, and the progress report consists of two areas that will be approached through several workshops.

The first part addresses data structure clarification and explores technical possibilities between the two platforms (Table 1).

The data structures and access points are very different, but a direct or indirect linkage between the records is possible, covering many entities, including DOI (datasets), ORCID (persons), ROR (organisations), URI, and GND (persons and keywords).

Table 1 – Comparison of swisscovery and Connectome.

swisscovery	Connectome
MARC21 XML/Dublin Core	Schema.org + RESCS (Research Commons) SHACL shapes
OAI/SRU/API	GraphQL API
Mainly library data/textual data	Broad data which is mapped
Fine granularity	Coarse granularity
Complex workflows/topology	Complex workflows/topology
Data hosting and harvesting	Data harvesting

As a basis for all the following measures, it is highly important to establish a joint user community. SLSP has, independently of this project, already developed personas in an Agile project management workshop facilitated by a lecturer in digital business management. These personas were further shaped through collective discussions and insights. Two of them demonstrate a strong connection to research-related activities, which is the expected target group of Connectome. Furthermore, personas that do not use swisscovery are crucial for understanding motivations and research conduct locations (Figure 2). They will help find strategies to enhance swisscovery's appeal in research data options.

For the project, the abstract SLSP personas will be extended with practical user stories: A student/researcher wants to find and access resources/datasets. As Connectome also offers information on people and projects, the need to network with other researchers is likewise addressed. The interest in 'grey' data and open educational resources (OER) is treated as special cases.

To recruit participants covering several domains, a call was published on several platforms. The user workshops would use mixed methods such as focus groups, design thinking, and usability walk-throughs, as well as an open approach.
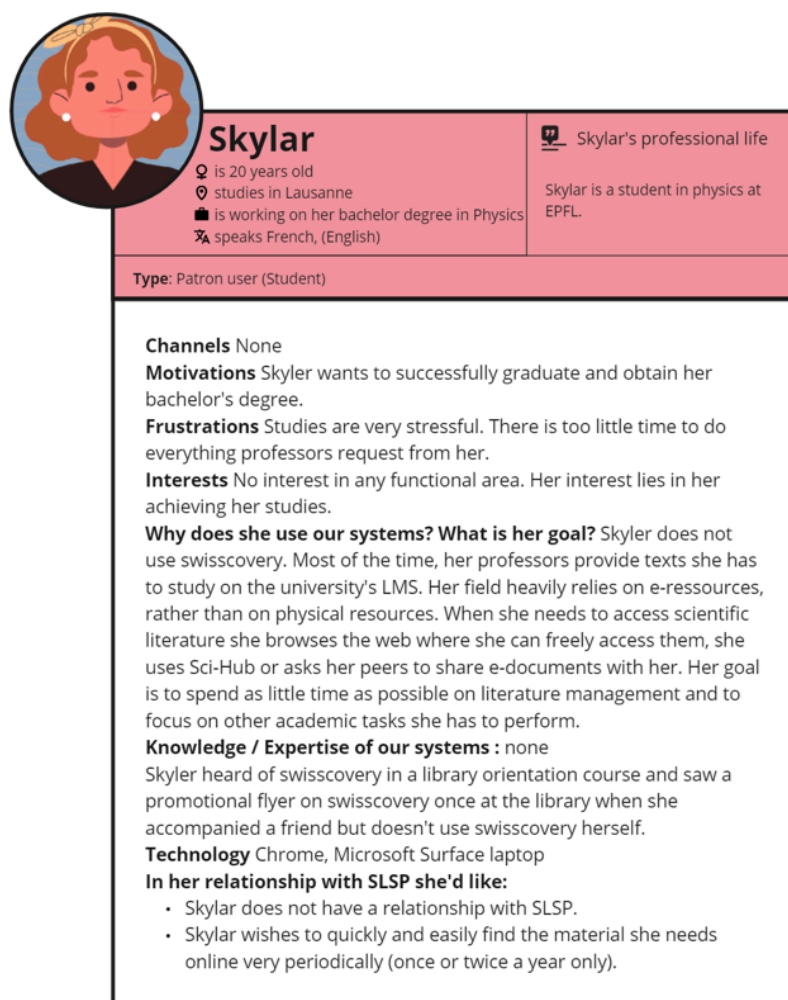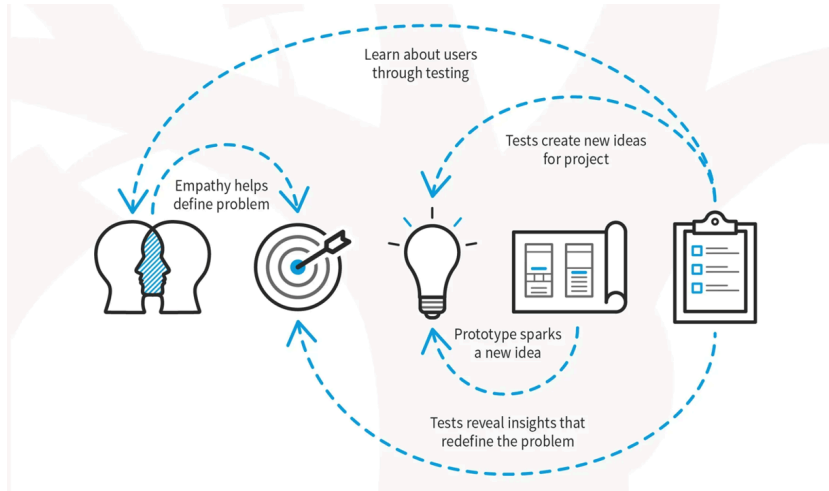
Figure 2 – Persona 'Skylar'.

Figure 3 – Workflow for user workshops.

The idea was to have a series of workshops. A hypothesis (1) would be created in the first one, and an evaluation would be presented in the last one (2) as shown in Figure 3. The first workshop has already taken place, focusing on understanding and prototyping research data discovery needs in swisscovery. Several researchers with cross-disciplinary backgrounds (computer science, health science, and finance and law) participated in the workshop. Common tasks to find research data were detected, covering topics such as raw data versus secondary data, data impact, full-text access, data granularity, and reference management. Afterwards, empathy mapping was performed to highlight critical points in the discovery process. All the workshops will result in the creation of initial conceptual wireframes and designs in harmony with the acceptance criteria of a discovery prototype.

Future Challenges

The project itself faces several challenges. Regarding the data perspective, the 'Swissness of data' can create problems since researchers are usually more interested in an international focus. Furthermore, there is a difference between standardised data aggregation and standardised data curation. SLSP has an established community with which it can organise data curation within a framework (e.g. international cataloguing regulations). However, Switch harvests data and can merge it in a standardised way but has little influence on how the providers offer the

data. Finally, there is an overlap between Connectome and swisscovery in the provision of textual data, which raises questions about entity matching and whether the duplication of work can be avoided. Furthermore, there is also a difference in the business model. Connectome is already a few years old but still has the character of a flexible project, whereas swisscovery is the established main service of SLSP and its community and is, therefore, more firmly anchored. Although both institutions operate in an academic environment, the specific wishes of the shareholders may differ, which can be reflected in different visions for the project.

Much depends on the specific design of a user interface for a web service. For swisscovery to be able to offer its users a multifaceted service (e.g. resource sharing), the interface is already heavily filled with information, and there is a risk of overloading with the further integration of resources such as Connectome. Conversely, the integration of bibliographic data in Connectome can lead to such data being lost alongside project information and datasets, resulting in too much data scattering. Usually, the scope is important for information retrieval; in other words, every data type may need its special discovery platform. Finally, external dependencies can also pose a risk to the project. Specifically, swisscovery is based on the Primo VE system from the provider Ex Libris. A next-generation discovery experience is currently being developed for this system which will be reflected in a new UI, and SLSP is dependent on this development.[9] As the project runs for some time, it can lead to further unexpected changes, e.g. disruptions through technological leaps in artificial intelligence.

The Case of the Swiss National Library

Within the libraries of Switzerland, the Swiss National Library occupies a prominent position, as its legal mandate places high demands and has numerous requirements. Due to these special circumstances, the library has not yet been integrated into the SLSP network. The library's collections include a vast array of materials, covering a wide range of subjects, which reflect the cultural, historical, and academic diversity of Switzerland. The first incorporating steps have been taken since the end of 2023, and the holdings of over 500 academic libraries from

9. https://knowledge.exlibrisgroup.com/Primo/Product_Materials/
001_Next_Discovery_Experience_(NDE)

swisscovery and the Swiss National Library have been searchable in a new search portal, Recherche Patrimoniale. This advancement has been made possible with SLSP's service SLSP Bibliographies which uses its framework to create special views that only provide bibliographic information.

SLSP Bibliographies: Meeting the Needs of Exposing Heritage Collections

Through a service called SLSP Bibliographies, swisscovery not only aggregates and displays cultural data but also offers specialised views. It is designed to showcase bibliographical references and specific collections without direct access to services; instead, it redirects users to swisscovery or other search platforms. The feature is particularly useful for creating themed collections or views focused on specific regions or topics. This service defines not only the more flexible configuration options but also certain limitations such as the duty to hide fulfilment-related UI elements, as these views should not compete with the regular local views of the swisscovery network which need to follow many pre-defined standard settings by SLSP. These standards are handled via SLSP's Master Template, where all discovery configuration parameters and differentiated, mandatory, and optional settings are documented as an orientation for all swisscovery libraries. In addition, a common usage of display fields in Primo is defined in the Master Template. For the bibliographic views, some flexibility is granted on the view level configuration, such as free choice of labels used for the specific view, facets of choice, brief record and full record displays, and many other configurations, while the parameters on the institution level need to stay untouched. Figure 4 provides a snippet from the SLSP discovery services definition, where the regular local views and the SLSP Bibliographies' views are handled differently in terms of allowed configurations.

Configuration description (for SLSP standard configuration see Master Template)	IZ view			Local view			Bibliography view	
View level configuration	**Basic Service**	**Optional Service**	**Comments**	**Basic Service**	**Optional Service**	**Comments**	**Service**	**Comments**
Facet number of values displayed	✗	✓		✗	✓		✓	
Sort	✗	✗		✗	✗		✓	
Dedup and Frbr	✗	✗	Exceptions to be check	✗	✗	Exceptions to be check	✓	
Resource type filters bar	✗	✗	Exceptions to be check	✗	✗		✓	
Brief Record Display								
Fields	✗	✗		✗	✗		✓	No changes of the content o
Record actions	✗	✓	Email, Citation, Print and Export RIS cannot be removed Export to Mendeley, on request only. The IZ is responsible for	✗	✓	Email, Citation, Print and Export RIS cannot be removed Export to Mendeley, on request only. The IZ is responsible for	✓	
Full Record Services								
Details (Full record display)	✗	✗	For exceptions, see Local fields concept (LINK).	✗	✗	See Local fields concept (LINK). Optional possibility	✓	No changes of the content of the field
Links, searchWithinJournal, quickAccess, getit_link1, recommendations, tags, browseshelf, citationTrailAndTimesCited, moreFromTheSame, rapidoOffer	✗	✗	RAPIDO For exceptions, see also Local fields concept and customization tab	✗	✗	RAPIDO See also Local fields concept and customization tab (LINK)	✓	Fulfillment forms and delivery options must not be displayed in the bib. view. See also Local fields concept and customization

Figure 4 – Snippet from the SLSP definitions for the discovery configuration and UI customisation.

Examples of SLSP Bibliographies include views created and managed by the *Bibliothèque cantonale et universitaire de Fribourg* for the cantonal bibliography and ETH Zurich for international collections, such as the Thomas Mann International search portal. The first example of the *Bibliographie fribourgeoise* view,[10] showing the bibliography of the canton Fribourg, lists printed and audiovisual documents with a Fribourg theme, as well as literary, musical, and artistic publications by Fribourg authors. The research portal TMI Research of the Thomas Mann International network provides access to extensive archives from various institutions, including Buddenbrook House/Heinrich und Thomas Mann Centre in Lübeck, Monacensia im Hildebrandhaus in Munich, Thomas Mann Archives of the ETH in Zurich, and Thomas Mann House in Los Angeles.[11] It offers resources such as manuscripts, letters, photographs, and personal libraries of Thomas Mann and his family, with many materials digitised and searchable online. Access includes specialised databases, photo archives, and a comprehensive collection of works related to Thomas Mann's life and influence. The data from the various sources was harvested to ETH and separated from the regular inventory as most of these resources do not provide direct access to the sources, unlike to the rest of the resources found in swisscovery. This view served as a pilot for SLSP to establish the SLSP Bibliographies service through

10. https://slsp-bcufr.primo.exlibrisgroup.com/discovery/search?vid=41SLSP_BCUFR:BFR
11. https://search.thomasmanninternational.com

close exchange with ETH, but also with Ex Libris to accelerate certain developments which were crucial for the configuration. Another example is the *Recherche Patrimoniale*,[12] a project between the Swiss National Library and SLSP (Figure 5).
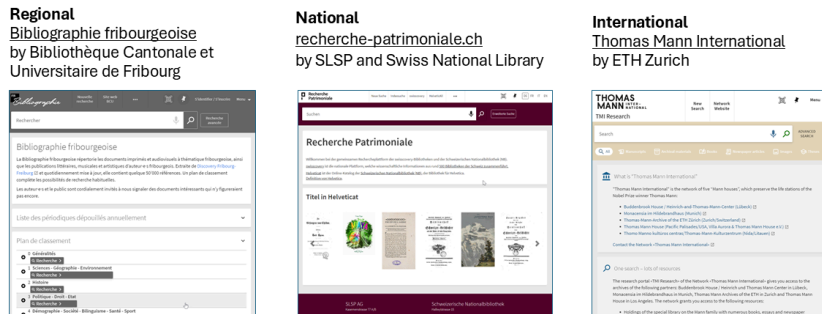
Regional
<u>Bibliographie fribourgeoise</u>
by Bibliothèque Cantonale et
Universitaire de Fribourg

National
<u>recherche-patrimoniale.ch</u>
by SLSP and Swiss National Library

International
<u>Thomas Mann International</u>
by ETH Zurich

Figure 5 – Examples of views created within the framework of the SLSP Bibliographies service.

Swiss National Library and Recherche Patrimoniale: A Collaborative Effort

The Swiss National Library and SLSP collaborated to create the *Recherche Patrimoniale* platform, which offers the public easy and extensive access to the participating libraries' collections. SLSP manages the operation of *Recherche Patrimoniale*, ensuring that SLSP standards are applied to both data processing and presentation (Swiss National Library, 2024). Although the Swiss National Library is not integrated into the SLSP network, the collections from both institutions have been made accessible through the *Recherche Patrimoniale* portal, uniting resources across two different Alma environments by harvesting the National Library's data via OAI-PMH into the Alma instance of the SLSP Network Zone. Like in ETH's example above, this data has been excluded from the regular swisscovery search scopes to avoid mixing titles into the results where no direct access to the resources is possible for the swisscovery users. The titles are, therefore, only searchable in the dedicated view in the SLSP network zone. This specification means that the search portal redirects end-users from this view to the original search platforms swisscovery and Helveticat, as shown in Figure 6.

---

12. https://www.recherche-patrimoniale.ch
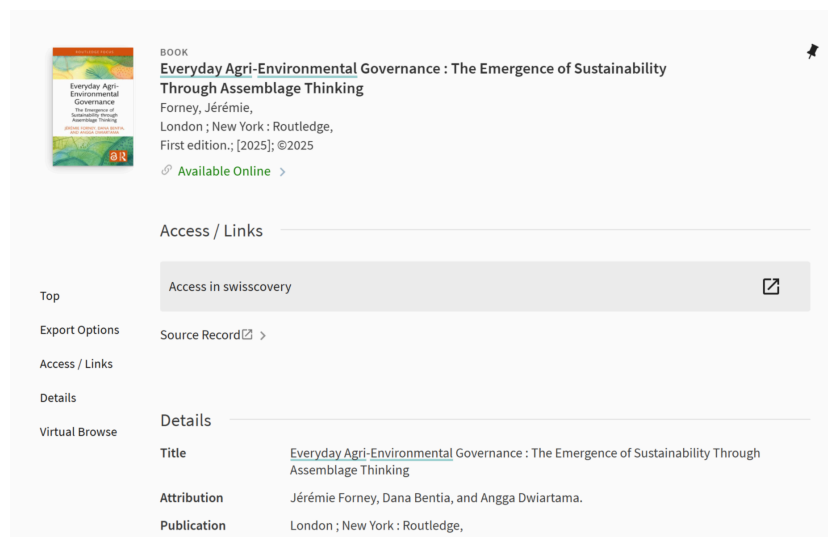
Figure 6 – Example of a full record display in Recherche Patrimoniale with re-directing link.

Future Challenges

The SLSP Bibliographies concept faces organisational challenges, including varying requirements and knowledge levels across libraries, highlighting the need for thorough requirements elicitation. Technically, there are limitations in excluding external data from regular searches, with only three data sources being allowed for exclusion and no post-login data exclusion in the network zone view swisscovery. The ability to configure only at the view level further restricts, for instance, settings related to multilingualism for a specific view or the creation of an additional search index. Moreover, operating within a complex and large network introduces performance issues when local search indexes are added. Another challenge is ensuring that digital objects which are stored in Alma can be shared across the network without inadvertently affecting other institutions' local search scopes in their local Primo views. Another possibility could be to refrain from using digital storage in Alma but to use the solution of the configuration of remote repositories in Alma.

Looking ahead, there are opportunities for further collaboration, both within Switzerland and internationally. The *Recherche Patrimoniale* and the Thomas Mann International view could serve as models for future initiatives that bring together even more patrimonial libraries and cultural

institutions within the SLSP framework. These future collaborations will require careful planning, resources, and a clear understanding of each institution's unique needs and legal requirements. Also, the technical limitation regarding the separation of certain titles deriving from external data sources, as described above, needs to be assessed.

When considering fully integrating patrimonial libraries, such as the Swiss National Library, into the swisscovery network and not only bringing them together in a joint discovery platform in the future, several critical aspects must be evaluated. Patrimonial libraries, unlike public and academic libraries, are legally required to preserve and make available certain collections, which can include bibliographical metadata that forms part of the cultural patrimony. In the swisscovery network, catalogue data can be modified by all participating libraries, raising concerns about data sovereignty and the integrity of these collections. Additionally, the integration of APIs and interfaces with external data sources needs careful planning to ensure compatibility and security. User data management also presents challenges as swisscovery users are connected via Switch edu-ID and managed centrally, but cantonal libraries include a broader user base, such as pupils and elderly individuals, necessitating tailored solutions. Finally, legal aspects, including terms of use, must be clarified, as several cantonal libraries operate under different terms than those harmonised across the SLSP network. Addressing these issues will be crucial for a successful and sustainable collaboration.

Conclusion and Outlook

This contribution aims to provide an overview of the data available in swisscovery and its handling by SLSP and to deliver insights into the current state of the Connectome project and the National Library case studies. Although both projects have different focuses, they have a major commonality, namely discovery. One challenge is to ensure that the user is not overwhelmed by the information being offered while at the same time maximising the use of resources. As Bertino (2024) points out, intelligent suggestion systems can offer help here, even if they harbour risks (e.g. confirmation bias and popularity bias). A current example is the Research Assistant from Ex Libris. This AI-powered tool enhances users' search experience in swisscovery by allowing natural language queries and providing summarised answers based on a comprehensive index of over five billion scholarly records from various publishers,

aggregators, and repositories. The tool uses large language models to generate reliable responses, with sources displayed for easy verification and further exploration.

To improve the user-friendliness of swisscovery, SLSP commissioned the Swiss Institute for Information Science (SII) at the University of Applied Sciences of the Grisons to conduct an independent usability study in 2013.[13] The findings of this research will be continually utilised to enhance swisscovery. They can also be used for neighbouring initiatives that have discovery components (i.e. patrimonial view and Connectome).

Ongoing collaboration between major Swiss players is crucial to keep pace with the evolving data infrastructure, and networking with loose networks such as OpenGLAM can also be beneficial.[14] Additionally, generating impact and reaching target groups for digital objects requires innovative approaches, such as leveraging visual platforms such as Instagram or TikTok, as Marika Sarvilahti's contribution demonstrates (2025).

In summary, swisscovery's efforts to preserve and make accessible Switzerland's cultural heritage are crucial for supporting research and education. Through services such as SLSP Bibliographies and projects including Connectome and *Recherche Patrimoniale*, SLSP, the organisation behind swisscovery, continues to enhance access to the country's rich cultural data, benefiting researchers, scholars, and the public. In the future, ongoing collaborations, thoughtful customisations, and strategic outreach will be key to addressing upcoming challenges and ensuring the continued success of swisscovery.

References

Bertino, A. (2024). Serendipität und Open Data. Richtlinien für die Implementierung von Empfehlungssystemen auf Entdeckungsplattformen. *Bibliothek Forschung und Praxis*, *48*(2). https://doi.org/10.1515/bfp-2023-0059

Colla, J. (2025). ODIS: The contextual disclosure of heritage collections through a joint database on the history of civil society. In F. Renaville, R. Adam, & C. Oger (Eds.), *Opening up our heritage: Challenges*

---

13. Internal document within the SLSP community.

14. https://glam.opendata.ch

and opportunities in digitising and promoting cultural and research collections. Presses Universitaires de Liège, ULiège Library. https://doi.org/10.25518/978-2-87019-330-3.09

Estermann, B. (2014). Diffusion of open data and crowdsourcing among heritage institutions: Results of a pilot survey in Switzerland. *Journal of Theoretical and Applied Electronic Commerce Research*, *9*(3), 15–31. https://doi.org/10.4067/S0718-18762014000300003

Hauf, N., Fürholz, A., Klaas, V. C., Morger, J., Šimukovič, E., & Jaekel, M. (2021). *Data reuse in the social sciences and humanities: Project report of the SWITCH innovation lab "Repositories & Data Quality"*. ZHAW Zurich University of Applied Sciences. https://doi.org/10.21256/ZHAW-2404

Roued-Cunliffe, H. (2020). *Open heritage data: An introduction to research, publishing and programming with open data in the heritage sector*. Facet Publishing. https://doi.org/10.29085/9781783303618

Sarvilahti, M. (2025). Strategies for promoting the use of digital cultural heritage collections with student and researcher engagement. In F. Renaville, R. Adam, & C. Oger (Eds.), *Opening up our heritage: Challenges and opportunities in digitising and promoting cultural and research collections*. Presses Universitaires de Liège, ULiège Library. https://doi.org/10.25518/978-2-87019-330-3.18

Swiss National Library. (2024). *Annual report 2023*. https://www.nb.admin.ch/dam/snl/en/dokumente/nb_als_flag-einheit/jahresbericht/jb-2023-nb.pdf.download.pdf/jb-2023-nb.pdf

Switch. (n.d.). *Innovation*. https://www.switch.ch/en/about/innovation

Abstract

The Swiss Library Service Platform (SLSP) was established in 2017 to consolidate and centralise library data and services across Switzerland. This article examines two projects that illustrate SLSP's role in managing and disseminating cultural heritage data: the Connectome project and the collaboration with the Swiss National Library. The Connectome project, in partnership with Switch, aims to promote open data practices by linking diverse metadata into a knowledge graph, enhancing discoverability through artificial intelligence-driven recommendations. The collaboration with the Swiss National Library focuses on integrating the library's vast collections into the swisscovery platform, creating a

unified search experience. Both projects underscore the challenges and opportunities in managing cultural data, particularly in terms of data integration, user experience, and discovery. The article especially highlights the importance of usability in these initiatives, as SLSP strives to ensure that users can effectively navigate and access Switzerland's rich cultural heritage without being overwhelmed. Thoughtful customisation, ongoing collaboration, and enhancements are crucial for overcoming future challenges and maximising the impact of these discovery platforms.

Keywords

ODIS: The Contextual Disclosure of Heritage Collections Through a Joint Database on the History of Civil Society

Joris Colla

ODIS: An Introduction

At the dawn of the new millennium, four major private cultural archives in the Flemish region of Belgium were looking for a system to store, interconnect, and disclose contextual data sets on their heritage collections, which consist primarily of archival, library, and audiovisual materials. These organisations – ADVN, archive of national movements in Antwerp; Amsab-Institute of Social History (Amsab-ISG) in Ghent; KADOC-KU Leuven, Documentation and Research Centre on Religion, Culture, and Society in Leuven; and Liberas, Heritage Centre for the History of the Freedom Ideal in Ghent (the former Liberal Archive) – joined forces. In 2000–2003, funded by a grant from the Max Wildiers Fund of the Research Foundation Flanders (FWO), the organisations were able to develop ODIS, a contextual online database where heritage organisations and researchers compile, build, and share knowledge on the history and heritage of civil society in Flanders, within its Belgian and international context (Heyrman & Weber, 2007; ODIS, n.d.-b).

After the launch of the ODIS database, other heritage and research organisations and projects joined the partnership, making ODIS one of the most widely used historical research instruments in Flanders and Brussels.[1] As ODIS does not receive recurrent structural funding, its maintenance is made possible by the annual operational usage fees paid by the members of the partnership. In 2006, the management of the database was entrusted to a nonprofit association under Belgian law (asbl/vzw).[2] The universities of Antwerp (UA), Brussels (VUB), Ghent

---

1. A complete overview of the ODIS partners, with links to their websites, is available on the ODIS website (ODIS, n.d.-a).

2. The bylaws of the nonprofit organisation Onderzoekssteunpunt en Databank Intermediaire Structuren in Vlaanderen (19de–20ste eeuw) were published in the Belgian Official Gazette (*Belgisch Staatsblad/Moniteur belge*), 13 November 2006,

(UGent), and Leuven (KU Leuven) are represented in its general assembly. The day-to-day coordination of ODIS is ensured by KADOC, which is an interfaculty centre of the Human Sciences Group of KU Leuven (University of Leuven), while LIBIS-KU Leuven is the main technical service provider.

From 2009 to 2014, a research infrastructure grant from the Hercules Foundation of the Flemish authorities enabled the development of a new ODIS database. The data model was expanded with new modules for the description of buildings, families, and events. At the same time, bilingualism (Dutch and English) was implemented, significantly increasing the database's usability (De Maeyer, 2015). Since 2022, ODIS has been undergoing another renewal process, which we will explore more in detail in the final section of this paper.

Stimulating cross-fertilisation has always been a major goal of ODIS. As the database is used by a large network of partners, its content addresses many thematic fields at the international, national, regional, and local levels. Data sets on various social domains are interconnected, including social organisations, politics, art and culture, media, church and religion, education, care, migration, and local civil society. Furthermore, as both heritage and research organisations are involved, ODIS has a bridging function between the custodians of cultural heritage collections (mainly archivists and heritage librarians) and researchers. It offers them a joint platform where the contextual disclosure of heritage is a lever for innovative, interdisciplinary research into the history of civil society (Angelaki et al., 2019).

In January 2025, the database contained 318,026 records. They include comprehensive data sets on organisations, persons, families, buildings, and events, as well as records with basic information on the documentary heritage of civil society in the form of archives and publications (mainly periodicals). Almost half of the records (153,970; 48.4%) were published in the ODIS public catalogue (OPAC). They are available under a Creative Commons license (CC BY-NC-SA 4.0), encouraging their reuse in other noncommercial initiatives and projects. In 2024, the OPAC

884.703.544. Their most recent update was published on 8 January 2024 (Onderzoekssteunpunt en Databank Intermediaire Structuren, 2024).

was visited 108,173 times by 72,720 unique visitors, resulting in 577,810 page views.[3]

The Multifunctional Use of ODIS

The question arises as to how the members of the ODIS partnership make use of the database. Foremost, ODIS offers the members a safe and stable environment to store, supplement, update, and correlate contextual data sets and repertories. Data entry is done in two ways: manually and automatically. In 2023, about 75 people manually entered data. They included staff from the partner organisations, as well as a pool of volunteers. Manual data entry is mainly based on sources kept in the collections of the partners. Well-structured data sets that are available in digital form (e.g. an Excel file or an Access database) can be loaded into the database by the ODIS help desk, making time-consuming manual data entry unnecessary. These data conversions often involve data sets that were created in the context of research or heritage projects. By incorporating them into ODIS, they will be permanently preserved after the project ends, protecting them from dispersion and oblivion.

Second, ODIS is used to validate data – this means subjecting data to quality checks – and publish them on the World Wide Web, via the ODIS OPAC and specific OPACs on the websites of partners and projects. The partners and their data inputters autonomously decide which records are ripe for publication. However, care must be taken to protect personal data, following the European General Data Protection Regulation (GDPR) and the ensuing Belgian legislation. ODIS contains a lot of data that the GDPR considers as 'special categories of personal data', such as data on 'political opinions, religious or philosophical beliefs, or trade union membership' (Art. 9 GDPR). The general principle within the ODIS partnership is that records about living persons are never published unless the persons concerned grant permission or the records contain only information of a public nature.

End users of ODIS (outside or within the partner organisations) can approach the available data sets multifunctionally (Colla & Heyrman, 2019; Heyrman, 2025). First, ODIS functions as a digital *encyclopaedia* where people can look up validated basic and/or background

---

3. More information on the content and use of ODIS can be found in the ODIS annual reports, available in Dutch on the ODIS website (ODIS, n.d.-c).

information on organisations, persons, families, buildings, and events. The partners' reading room services also make intensive use of the database in that way. They often answer content-related questions by referring readers to ODIS records. Sometimes, the consultation of the database even replaces the consultation of physical heritage. An example are the ODIS records on the members of religious orders and congregations, which incorporate information from the membership registers and/or personal files in the archives of those institutes, often kept in KADOC.[4] Researchers looking for basic information on the individuals involved no longer have to come to the reading room to explore the archives.

ODIS can also be approached as a *heuristic instrument*. It is a joint gateway to source materials, offering basic information on (periodical) publications and archives, with (deep) links to primary catalogues and digital repositories. Many ODIS partners use the system to offer end users a repertory of the periodicals and archives in their own collection. However, the database is also suitable for the development of thematic source guides, which are not limited to the heritage collections of the partners. Examples are the *Repertory of the Belgian Rural Press* made up by the Interfaculty Centre for Agrarian History (KU Leuven) or the archival records that are part of the *Survey Map of the Migratory Civil Society and its Cultural Heritage in Flanders, 1830–1990*, a project carried out by Amsab-ISG and KADOC (CAG, 2021; Migrantenerfgoed, 2014).

Third, ODIS is used as an *authority database*. Links to ODIS records are included in the primary catalogues and digital repositories of the members of the ODIS partnership but sometimes also of external organisations. Establishing such links provides information seekers with validated background data on, for example, the author of a book, the organisation that published a particular brochure, or the building that is the subject of an article. Because of the collaborative nature of ODIS, partners do not need to collect those background data separately in their own systems and can benefit from each others' data sets. A good example of the use of ODIS as an authority database are the links to records on the historical development of parish structures included in the

---

4. These records are part of the *Biographical Repertory of the Clergy and Members of Religious Institutes in Belgium, 1750–Present*, developed in ODIS by KADOC and its partners.

digital repository Teneo, where KADOC's digital/digitised collection of local parish journals is made available for consultation (Limo, n.d.).

Finally, ODIS also functions as a *digital humanities research tool*, enabling its partners and end users to analyse data sets using advanced search tools based on systematic data input done via thesauri and vocabularies (see further). The extensive biographical data sets in ODIS, for example, are well-suited for prosopographic research. When one has, for instance, a complete repertory of members of a particular organisation, one can easily query those data using a combination of various parameters, such as place of birth and death, education, occupations, honorary decorations, language skills, or political mandates. Often, data sets resulting from a research project are loaded into ODIS after the completion of the project to ensure their preservation and the reproducibility of the research conducted. However, some researchers use ODIS from the beginning of their project as a tool for data storage and analysis. An appropriate example is the research on book history at the Research Group Early Modern History of KU Leuven, where ODIS was the central research tool for the PhD projects *Impressa Catholica Camercacensia (ICC)*; *Impressae. Women Printers in Early Modern Antwerp, Leuven and Douai*; and *Manuale Lovaniense* (Cammaerts, 2024; KU Leuven, 2023; Soetaert, 2019; Wyffels, 2021).

Key Features of the Database

The ODIS Data Model

The ODIS data model consists of seven interlinked main entities/ modules in which organisations, persons, families, buildings, events, archives, and publications are described. Furthermore, an auxiliary module for the description of repositories is available. It is linked to the repository module of Archiefbank, the database of Archiefpunt, a cultural heritage organisation that aims to raise awareness for private archives in Flanders and Brussels (Archiefpunt, n.d.).
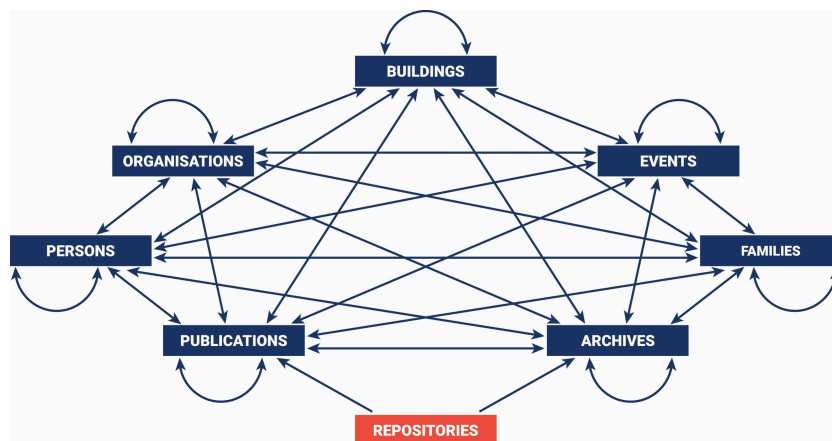
Figure 1 – Entity-relationship diagram of the ODIS database.

The structure of the ODIS modules is based on international standards wherever possible: ISAAR (CPF) for organisations, persons, and families; the DOCOMOMO Guidelines for buildings; ISAD(G) for archives; ISBD for publications; and ISDIAH for repositories (DOCOMOMO International, n.d.; International Council on Archives 2024a, 2024b, 2024c; IFLA, 2011). All modules share a parallel structure. Each of them features authority entries for identification data (e.g. names, titles, dates, and places of birth and death). Furthermore, data inputters can use both free text fields and repeatable fields/field groups. In the latter category, data are systematically inputted based on controlled thesauri and vocabularies, enabling advanced search queries. Finally, ODIS features relational field groups, a particular type of repeatable field group. These groups ensure the interconnection between the ODIS modules and enable the creation of clear, unambiguous links between records. By doing so, data are placed in a broader context and contextual information clusters are built, which – with some research effort – paint a picture of civil society and its key players in Flanders/Belgium. As only some authority entries are mandatory, the ODIS partners can decide how to build their data sets and which fields and field groups to prioritise in light of their objectives. As already mentioned above, the partners also independently determine if and when they would like to publish their data sets in the OPAC.
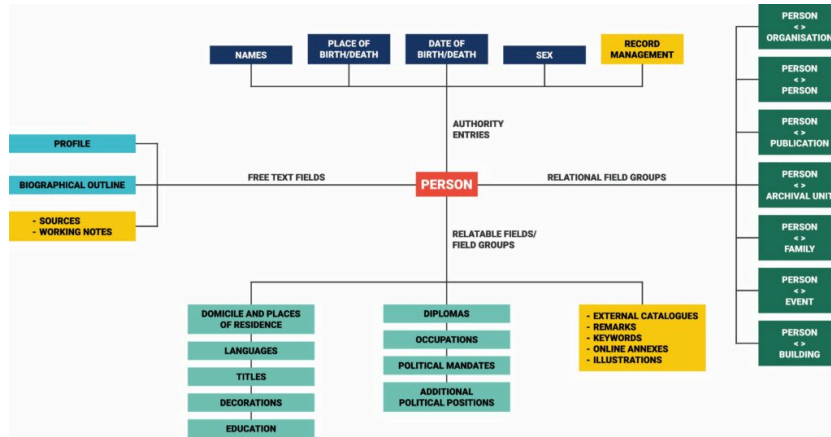
Figure 2 – The structure of a biographical record in the ODIS database.

Multilingualism and Multicontextuality

A main goal of the ODIS Renewal Project 2009–2014 was the internationalisation of the database. In that respect, there are two pillars. The first one is *multilingualism*. Since 2013, ODIS has been available in both Dutch and English, and each record has a Dutch and an English version. Data inputters choose which language they want to use. As the Dutch and the English versions of a record only share some language-independent authority entries, both versions can be developed independently. Translation projects aimed at closing the gaps between the Dutch and English versions of records have already yielded great results. In parallel, strategies for the automatic exchange of more data between the language versions of a record are currently being investigated. In the future, we also hope to add additional language versions, moving from bilingualism to true multilingualism.
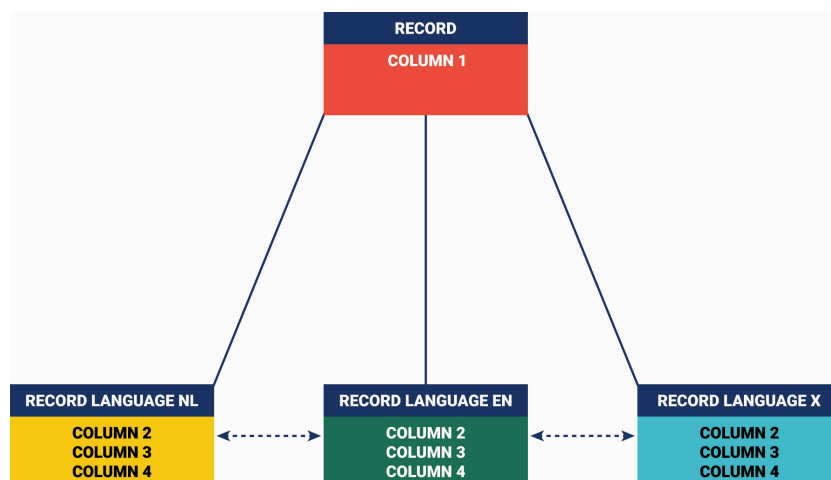
Figure 3 – Relation between the language versions of an ODIS record.

The second pillar is the so-called *multicontextuality* of the database. It means that some thesauri, which initially had a Flemish/Belgian scope, were broadened to other contexts/countries. Therefore, the thesaurus of legal forms in the organisational module and the thesauri of decorations, levels of education, political positions, political bodies, and political competences in the biographical module contain terms from 10 European contexts. The geographical thesaurus – which is hierarchically structured and based on present-day administrative geography but with historical terms also included – encompasses Europe as a whole, supplemented with some specific place names outside Europe. The multilingualism and multicontextuality of ODIS make it possible to put Flemish/Belgian data in an international perspective and allow the storage and publication of data from other European contexts, for instance within the framework of international networks and projects.

Interconnectivity

ODIS positions itself as an information node in a broad network of online data collections. Its interconnectivity takes shape in the many links to and from the database. Both ODIS partners and other institutions and projects, such as the Royal Library of Belgium (KBR) or Wikipedia, include links to ODIS records in their catalogues, databases, and digital repositories. The persistent URL of each record can easily be used for that purpose, but several catalogues of the partners also dispose of made-to-measure plug-ins that facilitate linking to ODIS. In the opposite direction,

many links to external databases and catalogues are included in ODIS records. These links can be included ad hoc, but sometimes links are systematically established between ODIS and an external database. ODIS is also equipped with a database linking tool, which makes it possible to incorporate deep links to several library catalogues. Further, synchronisation procedures exist between ODIS and the archival catalogues of its partners, while the database itself is a provider of archival data for the above-mentioned Archiefbank. In collaboration with meemoo (Flemish Institute for Archives), the connection between ODIS and Wikidata is currently being strengthened on a project-by-project basis. In 2023, the authority data of about 31,000 biographical ODIS records were loaded into Wikidata; reciprocal links were added in both databases.

From ODIS 2.0 to ODIS 3.0

Striving for versatility, ODIS seeks to address and even anticipate the needs of its diverse partners and users, particularly in the domains of data visualisation, data analysis, and linked data use. Several features of the current database are somewhat outdated and no longer provide the expected functionalities. Therefore, nearly 10 years after the launch of ODIS 2.0 (2013), another comprehensive renewal of ODIS – which was recognised as a KU Leuven Core Facility in 2021 (KADOC-KU Leuven, 2024; KU Leuven, 2024) – became necessary. Propelled by a research infrastructure grant from FWO and benefiting from the technical collaboration with LIBIS, the database has embarked on a transformative journey from 2022 onwards.[5] The core ambition of the ODIS Renewal Project 2022–2027 is the development of a new ODIS 3.0 database (backend) and user interface (frontend).

Regarding the database, the decision was made to switch from a relational Oracle database to a triple-store database developed in Virtuoso. This transition is a challenging procedure. It involves organising all fields and objects that form the ODIS data model in a Google Sheets spreadsheet. This organisation is done module by module because each module poses a specific set of challenges. The spreadsheet is then used to generate SHACL files. These files are, in turn, used to raise both the

---

5. Research Foundation Flanders, I011122N. The supervisors of the ODIS Renewal Project 2022–2027 are Prof. Dr Kim Christiaens (KADOC-KU Leuven), Dr Peter Heyrman (KADOC-KU Leuven), and Jo Rademakers (LIBIS-KU Leuven).

architecture of the triple-store database and a JSON API, which will allow interoperability between the database, the new frontend, and third-party users (Aernouts & Celik, n.d.; Celik, 2024; JSON:API, n.d.; W3C, 2017). The process provides the opportunity to reassess the current metadata model and update certain fields. As mentioned above, the model used in the current ODIS database comprises elements of ISAAR(CPF), ISAD(G), and ISDIAH. These standards have been merged by the International Council on Archives (ICA) into the new description standard Records in Contexts (RiC).[6] Compliance with RiC and with the Open Standards for Linking Organisations (OSLO)[7] of the Flemish authorities is an important aspect of the model's redesign (International Council on Archives, 2024d; Vlaanderen, n.d.).

The new ODIS user interface will dispose of an interconnectivity and discovery layer, offering more and better connections with other catalogues, research instruments, platforms, and linked open data resources. It will be the cornerstone of a durable open access policy, based on the findable, accessible, interoperable, reusable (FAIR) principles (GO FAIR initiative, 2022). The interface will also facilitate the semantic enrichment of the ODIS content through interconnections with complementary data sets.

Further, the interface will be equipped with innovative tools to query, analyse, and visualise data sets, allowing ODIS users to respond to the challenges of present-day digital humanities research. The website will not only have a new layout but also an integrated geographical tool. This tool will make it possible to visualise all the geographical terms in a particular record on a map and spatially represent the results of advanced search queries with a geographical parameter. In that context, OpenStreetMap (OSM) is being used to refine and extend the existing geographical thesaurus (OpenStreetMap, 2024). At the time of writing, the old geodata are being mapped to the OSM model, and ways to

6. The International Council on Archives (ICA) launched its first drafts of a conceptual model and ontology for Records in Contexts in 2016 and most recently published versions 1.0 in 2023.

7. The Flemish authorities have been rolling out linked open data standards for several fields and have been in the process of developing a standard for cultural heritage since 2020. Their aim is to help facilitate data exchange within the heritage sector in Flanders, for example between archives and museums, but also to connect with international players.

incorporate the OSM data, either by ingesting and regularly updating them or through a live call, are being researched.

Network visualisation is also high on the agenda. Inspired by, for instance, the GND Explorer, a tool to search and represent the Integrated German Authority File (GND) managed by the German National Library, a network representation will be incorporated in ODIS records (GND-Explorer, n.d.). Users will be able to open the network of one record and, from there, further explore the multitude of relationships interconnecting records, potentially discovering network clusters at a higher level. In the academic year 2023–2024, an MSc Digital Humanities student at KU Leuven (supervised by Prof. Dr Katrien Verbert) worked on this topic. In her master's thesis, she produced a first draft of what a network visualisation of ODIS data could look like (Jin, n.d., 2024). Her research was already very promising, and her use of Gephi to represent a select data set yielded some exciting results. Her findings will serve as a starting point for developing the visualisation tool in the frontend.

In addition to the technical developments outlined above, the ODIS Renewal Project 2022–2027 also seeks to update the mission and goals of ODIS, foster data input and quality care, implement a revamped communication strategy, and strengthen participation. The latter means, among other things, that ODIS is increasingly profiling itself as a device for citizen science. Currently, people who consult the database already pass on information by mailing the ODIS help desk. In the new public interface, each record will have a contact form, which will make it easier to submit additions, comments, and suggestions. Spreadsheet templates for supplying information will also be provided.

An interesting test case in citizen science is the crowdsourcing project *Chapels in Flanders* (*Kapelletjes in Vlaanderen* in Dutch). Between 1998 and 2007, two volunteers created an inventory with basic data on and pictures of nearly 13,700 chapels in Flanders. In 2022–2023, these data and pictures were loaded into ODIS and subsequently forwarded to the new Omeka S website *Kapelletjes in Vlaanderen*, developed by LIBIS on behalf of PARCUM (Museum and Expertise Centre for Religious Art and Culture) and KADOC and in collaboration with the National Geographic Institute of Belgium (NGI-IGN). The website offers all interested individuals the opportunity to complete the data sets on chapels, building on the texts already present. It is also possible to register new chapels and place them on the map. After a quality check, the information appears online. The collected data will eventually flow back to ODIS, where

they will strengthen the contextual information clusters on local religious heritage (KADOC-KU Leuven & PARCUM, 2023).

Conclusion

Since its development in 2000–2003, ODIS has been used by a broad network of heritage and research organisations in Flanders and Brussels to compile, build, and share knowledge on the heritage and history of civil society. The functionalities of the device align with the mission of cultural heritage organisations such as archives and heritage libraries: to make historical sources and their context accessible and interpretable. ODIS is based on a cooperative model that creates bridges between heritage organisations and between the fields of heritage and research. It proves that cooperation is not only cost-saving and efficient but also generates significant added value.

The design and technical environment of ODIS have undergone changes over the years, with new functionalities being added. In 2022, a new transformation project was launched based on a research infrastructure grant from FWO. At the core of this project is the development of a new triple-store database and public interface. This aim stems from a desire to develop new ways to query, analyse, and visualise data sets and create an interoperability and discovery layer, strengthening the interconnectivity of ODIS. The journey to the new ODIS environment is an adventurous one. We are currently halfway through the process and on schedule to complete the project on time. We are convinced that the new features, tools, and functionalities will stimulate the innovative contextual disclosure of heritage collections and be a lever for impact-driven research initiatives, spanning boundaries and connecting various disciplines. We also hope that the investment programme will encourage organisations to join the ODIS partnership and incorporate their own data series, further strengthening the multifunctional potential of the database.

Acknowledgements

References

Aernouts, B., & Celik, M. (n.d.). *ODIS ontologie*. LIBIS. Retrieved October 28, 2024, from https://odis.q.libis.be/_doc/doc/index-nl.html

Angelaki, G., Badzmierowska, K., Brown, D., Chiquet, V., Colla, J., Finlay-McAlester, J., Grabowska, K., Hannesschläger, V., Harrower, N., Howat-Maxted, F., Ilvanidou, M., Kordyzon, W., Król, M., Losada Gómez, A. G., Maryl, M., Reinsone, S., Suslova, N., Sweetnam, M., Śliwowski, K., & Werla, M. (2019). *How to facilitate cooperation between humanities researchers and cultural heritage institutions. Guidelines*. Digital Humanities Centre at the Institute of Literary Research of the Polish Academy of Sciences. https://doi.org/10.5281/zenodo.2587481

Archiefpunt. (n.d.). *Home*. Retrieved October 29, 2024, from https://archiefpunt.be

CAG. (2021). *Repertorium van de Belgische landbouwpers*. Retrieved October 28, 2024, from https://cagnet.be/page/repertorium

Cammaerts, D. (2024). *Manuale Lovaniense: een sociaaleconomische en typografische studie van het gedrukte handboek aan de vroegmoderne Leuvense universiteit (1474–1650)*. [Unpublished doctoral dissertation, KU Leuven].

Celik, M. (2024, July 3). *GitHub – mehmetc/solis: Turn a SHACL file into an API*. GitHub. Retrieved October 7, 2024, from https://github.com/mehmetc/solis

Colla, J., & Heyrman, P. (2019). Het middenveld en zijn erfgoed in context: het veelzijdig gebruik van de onlinedatabank ODIS (2000–2017). In D. Leyder & N. Istasse (Eds.), *Ten dienste van de gebruiker. Over de zoekinstrumenten ontwikkeld door archivarissen en bibliothecarissen. Akten van het colloquium van 8 december 2017* (pp. 99–111). Archief- en Bibliotheekwezen in België.

De Maeyer, J. (2015). *ODIS: Database intermediary structures flanders (AKUL043). Final Report, June 2015*. https://www.odis.be/hercules/docs/FinalReport_AKUL043_ODIS.pdf

DOCOMOMO International. (n.d.). *Docomomo International – Architecture Archive*. Retrieved October 29, 2024, from https://docomomo.com

GND-Explorer. (n.d.). *Homepage*. Retrieved October 28, 2024, from https://explore.gnd.network/en

GO FAIR initiative. (2022, January 21). *FAIR principles – GO FAIR*. Retrieved October 4, 2024, from https://www.go-fair.org/fair-principles

Heyrman, P., & Weber, D. (2007). Intermediaire structuren in Vlaanderen: ODIS. In *Het Max Wildiersfonds geëvalueerd: archief en wetenschappelijk onderzoek* (pp. 73–80). Vlaamse Vereniging voor Bibliotheek-, Archief- en Documentatiewezen.

Heyrman, P. (2025). Online tools and instruments supporting the study of transnational elites: the functionalities of the contextual database ODIS. In A. Ciampani & T. Kroll (Eds.), *Transnational encounters? European elites, international associations and national states (1882–1914)* (pp. 117-128). De Gruyter Oldenbourg. https://doi.org/10.1515/9783111680590-009

IFLA. (2011). *International standard bibliographic description consolidated edition 2011*. https://www.ifla.org/wp-content/uploads/2019/05/assets/cataloguing/isbd/isbd-cons_20110321.pdf

International Council on Archives. (2024, January 31). *ISAAR (CPF): International standard archival authority record for corporate bodies, persons and families, 2nd edition*. Retrieved October 4, 2024, from https://www.ica.org/resource/isaar-cpf-international-standard-archival-authority-record-for-corporate-bodies-persons-and-families-2nd-edition

International Council on Archives. (2024, February 15). *ISAD(G): General international standard archival description – Second edition*. Retrieved October 4, 2024, from https://www.ica.org/resource/isadg-general-international-standard-archival-description-second-edition

International Council on Archives. (2024, January 31). *ISDIAH: International standard for describing institutions with archival holdings*. Retrieved October 4, 2024, from https://www.ica.org/resource/isdiah-international-standard-for-describing-institutions-with-archival-holdings

International Council on Archives. (2024, June 25). *Records in contexts – Ontology*. Retrieved October 7, 2024, from https://www.ica.org/resource/records-in-contexts-ontology

Jin, Y. (n.d.). *GitHub – Yiyao0515: ODIS – Network visualization*.

GitHub. Retrieved October 28, 2024, from https://yiyao0515.github.io/ODIS-Network-Visualization

Jin, Y. (2024). *The network visualization approach for the ODIS database* [MA thesis, KU Leuven].

JSON:API. (n.d.). *JSON:API — A specification for building APIs in JSON*. Retrieved October 28, 2024, from https://jsonapi.org

KADOC-KU Leuven & PARCUM. (2023). *Home – Kapelletjes in Vlaanderen*. Retrieved October 28, 2024, from https://www.kapelletjes.be

KADOC-KU Leuven. (2024, March 13). *KADOC – ODIS: KU Leuven core facility on religion, culture and society*. Documentatie- en Onderzoekscentrum voor Religie, Cultuur en Samenleving. Retrieved October 28, 2024, from https://kadoc.kuleuven.be/english/3_research/31_ourresearch/ODIS/index

KU Leuven. (2023, December 13). *Book history – Early modern history*. Retrieved October 28, 2024, from https://www.arts.kuleuven.be/nieuwetijd/english/book-history

KU Leuven. (2024, October 29). *KU Leuven core facilities*. Retrieved October 29, 2024, from https://research.kuleuven.be/en/research-areas/core-facilities

Limo. (n.d.). *Parochiebladen / Kerk en leven*. Retrieved October 28, 2024, from https://kadoc.limo.libis.be/discovery/collectionDiscovery?vid=32KUL_KADOC:KADOC&collectionId=8158340000001480&lang=nl

Migrantenerfgoed. (2014, May 8). *Home*. Retrieved October 28, 2024, from https://www.migrantenerfgoed.be

ODIS. (n.d.-a). *About ODIS*. Retrieved October 21, 2024, from https://www.odis.be/hercules/_en_overODIS.php

ODIS. (n.d.-b). *Home*. Retrieved October 21, 2024, from https://www.odis.be

ODIS. (n.d.-c). *Over ODIS*. Retrieved October 22, 2024, from https://www.odis.be/hercules/_nl_overODIS.php

Onderzoekssteunpunt en Databank Intermediaire Structuren in Vlaanderen. (2024, January 8). Gecoördineerde statuten van de VZW

ODIS. *Belgisch Staatsblad / Moniteur belge*, Annexe n⁰ 24004971. https://www.ejustice.just.fgov.be/tsv_pdf/2024/01/08/24004971.pdf

OpenStreetMap. (n.d.). *Welcome to OpenStreetMap*. Retrieved October 29, 2024, from https://www.openstreetmap.org

Soetaert, A. (2019*). De katholieke drukpers in de kerkprovincie Kamerijk: contacten, mobiliteit & transfers in een grensgebied (1559–1659)*. Peeters Publishers.

Vlaanderen. (n.d.). *OSLO*. Retrieved October 29, 2024, from https://www.vlaanderen.be/digitaal-vlaanderen/onze-diensten-en-platformen/oslo

W3C. (2017, July 20). *Shapes constraint language (SHACL)*. Retrieved October 28, 2024, from https://www.w3.org/TR/shacl

Wyffels, H. (2021). *Women and work in early modern printing houses. Family firms in Antwerp, Douai and Leuven (1500–1700)*. [Unpublished doctoral dissertation, KU Leuven].

Abstract

Established in 2000–2003, ODIS is a joint database on the history of civil society used by a broad network of heritage and research organisations in Flanders and Brussels. This paper provides a general introduction to ODIS and highlights how the members of the ODIS partnership deploy the system for the contextual disclosure of heritage by storing, supplementing, validating, and publishing data sets on organisations, persons, families, buildings, and events, as well as by providing basic information on documentary heritage. End users can approach ODIS as an encyclopaedia, a heuristic device, an authority database, and a digital humanities research tool. In the following section, we consider some key features of ODIS: its data model, its multilingual and multicontextual character, and its interconnectivity.

The final section is devoted to the current in-depth renewal of ODIS (2022–2027), which is being executed owing to a research infrastructure grant from the Research Foundation Flanders (FWO). At the core of the project is the development of a new triple-store database and user interface. The device will offer new ways to query, analyse, and visualise data sets, allowing ODIS to respond to the challenges of digital humanities effectively. The development of an interoperability and discovery layer will foster interconnectivity, and this layer is the

cornerstone of a durable open access policy. The new system will also be profiled as a tool for citizen science. In that respect, the crowdsourcing project *Chapels in Flanders* (using an Omeka S website related to ODIS) is an interesting test case.

Keywords

Citizen science; Civil society; Contextual disclosure of heritage; Digital humanities; Heritage and research database; Linked open data

Μετάdata: A Database for Translations of Literary Texts in Greek Periodicals

Despoina Gkogkou

The complex nature of translation, as a hermeneutic, culture-dependent gesture, has been extensively studied by Translation Studies scholars as well as by scholars in many adjacent fields of science and art.[1] The reflection has embraced various turns as the recently 'post-translation studies' which is defined by Siri Nergaard and Stefano Arduini as 'a sort of new era […], where translation is viewed as fundamentally transdisciplinary, mobile, and open-ended' (2011, p. 8), and is further explored by Gentzler (2017).

Following the scientific and cultural developments, translation and post-translation studies seek constantly to explore more in depth all possible dimensions of translation's dynamics, opening in new, under-represented in the past research areas, and work on an interdisciplinary basis with many other fields of study. This is the case of translations published in periodicals and anthologies, whose study is of interest for both Translation and Periodical Studies, which seem recently to burgeon (Van Remoortel et al., 2016). Our project aims to contribute to this debate with data from the Modern Greek field and this paper will tend to briefly describe it.

In Greece, noteworthy work has been done since the 1990s concerning periodicals but also anthologies. Apart from papers, monographs, and dissertations in the field, several research projects are helping us map the area and reveal its fruitfulness. From the many projects that focused on the Greek periodicals of the 19th and 20th centuries, we must mention the notable ones that have helped pave the way. One of the most

---

1. For a general overview of the Translation Studies, see the first issue of the journal Translation, available in open access through the platform of Milano University Press here https://riviste.unimi.it/index.php/translation/issue/view/1814. Other useful tools: *Routledge Encyclopedia of Translation Studies*, edited by Mona Baker and Gabriela Saldanha (Routledge, 2019), *A World Atlas of Translation*, edited by Yves Gambier and Ubaldo Stecconi (John Benjamins, 2019), and the 5 volume *Handbook of Translation Studies*, edited by Yves Gambier and Luc van Doorslaer (John Benjamins, 2010-2021).

significant projects was the Literary and Art Periodicals (1901–1940), under the scientific supervision of Professor Ch. L. Karaoglou from the Aristotle University of Thessaloniki. The project started in 1994, and its outcomes were published in four volumes, from 1996 until 2007, listing important publications and indexing their collaborators. Another important landmark capitalising on the trove held by the Greek libraries was the digital collections Kosmopolis and Pleias.[2] The project was implemented by the Library and Information Centre of the University of Patras, under the scientific supervision of the Department of Philology and in collaboration with the holders of the primary sources, namely the Library of the Hellenic Parliament and the Hellenic Literary and Historical Archive (ΕΛΙΑ).[3] This listing remains indicative and does not do justice to the numerous others developed by many Greek libraries and other institutions over the years.

Literary translations in the periodicals are a compelling area of study for various researchers who try to reach 'deeper into an interdisciplinary field that considers how culture, translation, and media theory conceptualise textual, contextual, and paratextual dynamics, as well as how sociological approaches to translation and publishing history can help us understand the journal as a network of social practice' (Fólica, Roig-Sanz, & Caristia, 2020, p. 2). Since it is widely accepted that translation has played a major role 'in the crystallization of national cultures' (Even-Zohar, 1990, p. 45) studying the Greek publishing history can help us better understand the country's literary history too.

In this regard, monumental bibliography research, such as the electronic catalogue Greek Bibliography of the 19th Century,[4] a database that relies heavily on work from various Greek scholars,[5] and the two-volume bibliographic work by K. G. Kasinis, who has indexed the Greek translations of foreign literature published between 1801 and 1950,

---

2. https://kosmopolis.library.upatras.gr and https://pleias.library.upatras.gr

3. *Daniilis*, the third digital collection, with material from the Municipal Library of Patras and with local interest, followed the previous two.

4. http://oldwww.benaki.gr/bibliology/en/19.htm

5. Its foundations lie in the works of Dimitrios Ghinis and Valerios Mexas (1939–1957), *Greek Bibliography 1800–1863* (Academy of Athens), and of Philippos Iliou and Popi Polemi (2006), *Greek Bibliography 1864–1900* (Philippos Iliou Bibliology Workshop / ELIA). It should be noted, however, that these bibliographies cover all published books, not just translations.

are a valuable tool for research. However, these works only cover one area, that of book publishing. The large number of literary works in periodicals is only partially indexed, and one must browse through and combine many different sources to obtain meaningful results. The only database that synthesises the research work in the field and is currently accessible is the Translations of Literature to Modern Greek: The Translation Production of the Eastern Mediterranean Hellenism During the Period 1880–1930.[6] This database not only combines translations printed in books and periodicals alike but also harvests material exclusively from the publishing scene of Hellenism in Asia Minor, Cyprus, and Egypt.

The Idea Behind **Μετάdata**

The University of Patras has a profound interest in Greek periodicals. In addition to the digital collections that the Library and Information Centre administers, a large collection of periodicals exists in the physical format (partly due to donations). Moreover, the Department of Philology has incorporated periodical studies into its curricula and founded EATT,[7] the Laboratory of Modern Greek Philology, which aims to use literary archives and the press for studying literature.[8]

The need for a tool that combines all the scattered data about the standalone translations of literary texts (ie that were not published in a book) was evident. **Μετάdata**[9] – a wordplay on the prefix $μετά$, after the Greek word for 'translation' ($μετάφραση$) – aspires to become the portal to all the translated literature published in Greek magazines, newspapers, and anthologies, from 1801 until 1974.[10] The dates are not arbitrary:

---

6. https://www.greek-language.gr/greekLang/literature/bibliographies/to_greek/ index.html. Although there is an introductory note in English, access to the content is only available through the Greek version.

7. https://eatt.philology.upatras.gr

8. At present, 17 theses and dissertations revolve around specific periodicals and include comprehensive indexes of them, all in open access through the institutional repository *Nemertes*.

9. https://library.upatras.gr/digital/metadata/#database. At the moment, the visualisation labels are only available in Greek.

10. We have excluded translations from Latin and intralingual translations from Ancient Greek.

1801 marks the beginning of a period during which Greek publishing progressively flourished and the Greek press began to emerge. The first Greek periodical, *Hermes o Logios* [*Ερμής ο Λόγιος*], appeared in 1811, followed by the first long-running Greek newspaper, *Hellenikos Telegraphos* [*Ελληνικός Τηλέγραφος*], in 1812, which lasted for 24 years. It is worth highlighting that both periodicals were published in Vienna, a major centre of the Greek diaspora prior to the establishment of the Greek state in 1830. Furthermore, the choice of the early 1800s ensures that the project aligns with the major bibliographic work of Philippos Iliou and the records compiled by K. G. Kasinis, which constitute fundamental documentation tools for the study of Greek book production from the 19th century onwards. The year 1974 is also a significant landmark in the history of modern Greece (the transition to democratic rule called *Metapolitefsi* [*Μεταπολίτευση*]), with implications for the country's cultural formations.

 As we were fully aware that this task was gigantic and almost unattainable, we had to set another limit for the time being. Given the personnel resources available at the moment, the decision not to study the primary sources was inevitable. Therefore, the indexing follows the work already done by Greek scholars and postgraduate students, which has already been reviewed and published. The general rule is to adhere to the original study, but we have made minor non-invasive corrections or additions after consulting with the primary sources for validation.

Structuring the Datasets

 The indexing of periodicals can be quite problematic, especially of those published more than a century ago or of the popular ones with more opaque editorial practices. During our research on the popular magazine *Bouketo*, we were misled several times, particularly by popular weeklies and other Greek pulp magazines (Gkogkou, 2023, pp. 68–69). Translated material is even more problematic due to the distance between the source text and the published article, which may contain numerous iterations, most commonly through intermediary translations. Another puzzling case is the phenomenon of pseudotranslations, which refer to 'texts which have been presented as translations with no corresponding source texts in other languages ever having existed – hence no factual 'transfer operations' and translation relationships'

(Toury, 1995, p. 40).[11] Apart from questionable translations, there are many other challenges, from the inability to identify the author or the original work to the lack of sufficient information about the translating process and its agents. Nevertheless, since our goal is to record precisely and accurately, but not to study intensively, whatever is labelled as a 'translation' is included. These works include adaptations presented as such despite being controversial (Bassnett, 2011), mediated translations, self-translations, and pseudotranslations.

The Sources

In plain terms, our database is a synthesis of indexes. Without the volume of research conducted by Greek scholars in the field, our eagerness may have been challenged by the difficult task of collecting, classifying, listing and documenting, evaluating, verifying, and identifying a huge amount of data. We are fortunate that the interest shown by Greek academia has been immense, providing a sizable corpus of quality work. We found that the literature mapping of the existing indexes was not very difficult: the titular standardisation (usually the word 'index' is present, along with the periodical's name and dates of circulation) facilitates retrieval through institutional repositories (many doctoral dissertations and master theses on extensive studies of specific periodicals include indexes) and library catalogues. Moreover, bibliographic endeavours (such as the Neohellenistis digital collection)[12] and the inclusion of the study of periodicals in the University of Patras's Department of Philology curriculum since 2008 proved useful.

By relying on already published and proofread work, we could not only eliminate the required time to find the translations by parsing the pages but also avoid possible errors, at least for works that incorporated

---

11. The complex significance of the translation process demands a thorough and separate study. However, we should mention that, so far, our research has been able to confirm a handful instances of pseudotranslations, casting some light on the reasons behind the phenomenon. Apart from being used for introducing literary novelties, such as the Greek crime fiction in the first half of the 20th century through pulp magazines, the case of Michalis A. Michailidis (1900–1988) in *Bouketo* reveals another factor: renumeration for translations was lower than that for an original text, and Greek publishers were willing to pay only renowned authors for originals, leading Michailidis to submit his own short stories as French translations (Gkogkou, 2023, pp. 67–68).
12. https://anemi.lib.uoc.gr/hierarchy/collection/010/index.tkl

years of workmanship and dove into the Greek press.[13] Not everything was perfect, however; certain easily identified mistakes were silently corrected, and minor alterations (mainly, additions) were made based on each re-indexer's discretion.

Defining the Necessary Fields

According to standard practice in periodical indexing, it is essential to include all the necessary information for the publication's identification. Following indexing in chronological order by issue, it is common practice among Greek indexers to include the following fields when working on a single periodical:[14]

- volume and/or issue number;
- date of issue;
- title(s) – subtitles or other paratextual elements such as column titles may be included;
- name of the author(s);
- short description of the subject or the translation or other relevant information (this is also an editing work);
- page number(s) – the page range for the article;
- genre; and
- information about instalments (indication about the starting and ending of a serial). The most common way to indicate this information is with the symbol → after the record for the first instalment and ← after the last.

Specifically for translations, the following fields are included:

- name of the translator(s);
- language or literary tradition; and
- title of original work (a task that, at times, requires in-depth research, especially for poetic texts or short stories).

13. Several archival works have not been published and were kindly offered by scholars doing research on a specific magazine or newspaper. Even though their inclusion moves away from the limits set, they are a valuable addition and fall within the general aim of recording. Those contributions are indicated on the sources list.

14. We owe most of the systematic work done on the field to Charalampos L. Karaoglou. The methodology, followed by many, is presented in his book for the journal *Ο Διόνυσος* [*Dionysos*] (1901–1902).

Minimising Data to Meet Our Needs

By carefully examining the available descriptive data and considering the purpose of our work (a stepping stone for more thorough research), we concluded that it was not viable to keep all the fields. In a large-scale indexing project like Μετάdata, high specificity and extensiveness might be confusing and impractical. As long as we were generally referring to original and exhaustive works, we decided that it would be reasonable, if not convenient, to avoid certain fields. One of these fields was pages. Even in the cases where the index is not (yet) published, the rest of the information suffices for only browsing through a few pages. Another field we excluded was genre, an admittedly 'problematic and unstable' concept that 'still awaits its Linnaeus' (Duff, 1999, p. 1, 17). Genres change over time, and hybridity in literature published in the press can blur boundaries. The subjectivity on this matter can also be found among the indexers, who must adjust to their source material and the perceptions of certain eras. The third field was the paratext. We retained information relevant to the act of translation, except when referring to mediation, although indirect translation has a long tradition in the reception of foreign literature in Greece, with translations from French gradually increasing over the Italian in the 18th century, as Kasinis (2006) has shown.[15] Undoubtedly, mediation in translation is a cultural phenomenon with a complex and intriguing character (Toury, 1995), and our decision was dictated merely by the incongruous information gathered and the inconsistency with which periodicals mention their source texts.

One other differentiation concerned the names: we dismissed the names of authors and translators as typed in the periodical, and we only used controlled vocabularies to ensure the consistency and uniformity of the database. For those unfamiliar with the peculiarity of the Greek alphabet, we must outline some points about depicting foreign names in Greek. Most of the time, foreign names are transliterated in the Greek alphabet by editors or translators. At times, transliteration reflects a decision based on pronunciation, for example, when the French poet Charles Baudelaire was transcribed as *Σαρλ Μπωντλέρ*; or a decision based on the spelling (*Τσαρλς Μπωδελαίρ*); or even a more radical choice to translate the given name as its equivalent Greek Κάρολος.

---

15. In his bibliography, unlike *Μετάdata*'s policy, Kasinis categorises translated works according to the source language, and not the original language.

Another common practice in the past was the Hellenisation of names, resulting in fairly odd correspondences, including Chateaubriand being translated as *Σατωβριάνδος* and Goethe as *Γοήθιος*. This information may have been interesting to historical orthography, but it would have also overloaded our data. Therefore, to have an accurate and unique record, we used authority records from either VIAF or BnF[16] for the authors (and translators) that we could identify.

We also partly retained the indication about serials. The mark follows each title only once, for the first instalment.

Figure 1 – Screenshot of the dataset.

Before continuing to present the database and its features, some basic information will give a general idea of the workflow. The database was implemented in Google Sheets (Figure 1), which is convenient for rapid indexing, allows collaboration and simultaneous work, and does not require significant database expertise. Each periodical was analysed in a different sheet according to a specific set of rules and practices. Whenever the indexing was completed, the data was pulled in with the rest of the information into a single consolidated sheet, which was then visualised through Looker Studio, a freely available visualisation tool offered by Google.

Data Visualisation

The richness of the dataset and the results of the copious indexing require visualisations to be appealing and comprehensive to users. To

---

16. https://viaf.org and https://data.bnf.fr, respectively.

visualise our data, we needed an easy-to-use, feature-rich tool, given the lack of technical expertise within the team and constraints set by the funding. We decided to utilise Looker Studio, a tool that allows complex visualisation through a variety of interactive charts and tables and data cross-filtering. These visualisations were implemented intuitively, and the result was seamlessly integrated into the University of Patras Library and Information Centre's existing website.

Tables

The central module of the visualisation dashboard consists of a table that contains all the paginated records, displaying the following three main fields (Figure 2): the title of the publication (as it was printed on the page), the name of the author, and the name of the translator (after the authority control, if possible). Apart from browsing through records, alphabetical sorting is also supported for each one of the fields, and automatic filtering is possible by clicking on one of the displayed records.

~ Τίτλος ▲	Συγγραφέας	Μεταφραστής
Αι άστοργοι μητέρες →	Millanvoye, Bertrand (1848-1913)	Σαλταμπάσης, Π. Κ.
Αι δοκιμασίαι της Ραϊσάς : μυθιστορία →	Gréville, Henry (1842-1902)	[Ανυπόγραφο]
Αι δυο αδελφαί	Alberie Kleinmann	Νικολαΐδου, Ειρήνη (186…
Αι δυο όψεις του νομίσματος	Tissot, Ernest (1867-1922)	Νικολαΐδου, Ειρήνη (186…
Αι δύο αντίζηλοι : (διήγημα)	Harvey	Α*
Αι δύο μεγάλαι ηθοποιοί	Jammes, Francis (1868-1938)	Χατζόπουλος, Δημήτριο…
Αι εθιμοτυπίαι	Le Roux, Hugues (1860-1925)	[Ανυπόγραφο]
Αι επιστολαί των Χριστουγέννων	[Ανυπόγραφο]	Βενετσανοπούλου, Μαρία
Αι επτά πριγκήπισσαι	Maeterlinck, Maurice (1862-1949)	Χατζόπουλος, Δημήτριο…
Αι λευκαί τρίχες μιάς βασιλίσσης	Janin, Jules (1804-1874)	Βλάχος, Άγγελος Σ. (183…

Συλλογικός πίνακας εγγραφών κατά τίτλο

Επιλέγοντας μια εγγραφή μπορείτε να δείτε τα αναλυτικά στοιχεία στην καρτέλα δεξιά

1311 - 1320 / 13861 ‹ ›

Figure 2 – The main table containing the running title, the author, and the translator.

Supplementary indexes (Figure 3) allow users to efficiently browse and retrieve authors, translators, and indexed periodicals. In these indexes, as in the titles list, all the records associated with that value are displayed by clicking on a specific name or magazine.

Πίνακες συγγραφέων και μεταφραστών				Αλφαβητικός πίνακας ευρετηριασμένων εντύπων	
Συγγραφέας	**Εγγραφές** ▾	**Μεταφραστής**	**Εγγραφές** ▾	**Εντυπο** ▴	**Εγγραφές**
[Ανυπόγραφο]	921	[Ανυπόγραφο]	8.941	Ακρίτας	27
Heine, Heinrich (1797-1856)	206	Κοτζιούλας, Γιώργος (1909-1956)	127	Ακρόπολις Φιλολογική	94
Maupassant, Guy de (1850-1893)	142	Κουκούλας, Λέων (1894-1967)	124	Δελτίο των Ολυμπίων	2
Moréas, Jean (1856-1910)	113	Καζαντζάκης, Νίκος (1883-1957)	123	Διόνυσος	79
Mendès, Catulle (1841-1909)	111	Νικολαΐδου, Ειρήνη (1866-19..)	93	Εβδομάς	233
Coppée, François (1842-1908)	97	Παπανικολάου, Μήτσος (1900-1...	87	Εκλεκτά Μυθιστορήματα	338
Hugo, Victor (1802-1885)	90	Τρικογλίδης, Κωνσταντίνος (18...	62	Ελληνικά Γράμματα	210
Daudet, Alphonse (1840-1897)	83	Αξιώτης, Παναγιώτης (1840-19...	61	Ενδοχώρα	112
Čehov, Anton Pavlovič (1860-19...	75	Αργυρόπουλος, Μιχαήλ (1862-1...	60	Επιθεώρηση Τέχνης	285
Goethe, Johann Wolfgang von (...	74	Στάης, Δημήτριος	58	Εσπερος	146
1 - 10 / 4969 ‹ ›		1 - 10 / 1110 ‹ ›		1 - 10 / 39 ‹ ›	

Επιλέξτε μια τιμή για να δείτε συγκεντρωτικά στοιχεία στον συλλογικό πίνακα. Απο-επιλέξτε από το βέλος πάνω αριστερά για να επιστρέψετε στο σύνολο των δεδομένων

Figure 3 – Tables of authors, translators, and periodicals (counts are also displayed).

Nevertheless, more fields have yet to be displayed in our dataset, and this analytic depiction of all descriptive elements has proven to be the biggest challenge for our visualisation. We have had to find ways to balance between the inconsistencies and irregularities of the publishing practice, the need to provide information as precisely and in as much detail as possible, and the requirement to adjust to the needs of researchers. This challenge has been especially apparent for the time series data, that is the information about the date of issue and its visualisation in the timeline chart (Figure 4). We have handled all these difficulties by adopting an external module, the templated record.
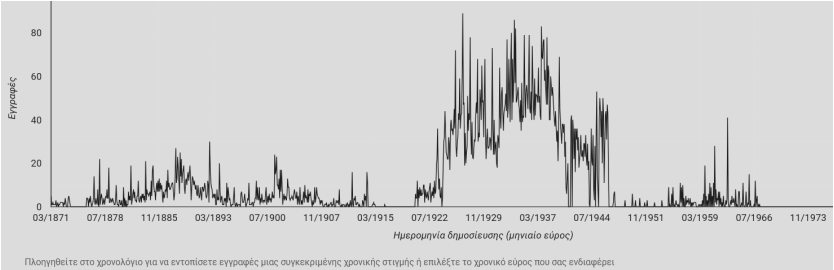
Figure 4 – The horizontal axis displays the dates on a monthly timescale and the vertical displays the number of records that correspond to each month.

Templated Record

To display all the details of a selected record, we customised and configured a templated record module that would visualise the rest of the information present in the dataset. Thus, by clicking on one of the records

142

in the titles index, all details are displayed and formatted via an HTML template, as shown below (Figure 5).

Figure 5 – Display of all data available for a single record.

This module was essential for several reasons, one of which was dates and times. Visualisation demands a specific data format, but the nature of our material does not always allow for compatible data types. Publishing at irregular rates is common for magazines. However, the main problem arises when the cover date does not have a single numerical value but rather a span or even a phrase that has no numerical connotation whatsoever, such as 'festive issue', 'extra', or 'summer issue'. Moreover, in Greek, the names of some months can appear with varying spellings, often due to changes in suffixes, though sometimes the differences are more substantial.[17] These chronological 'labels' can carry important information about the nature of the periodicals and should be transcribed exactly as they appear. A representative example is the semi-monthly magazine *Xekinima* (*Ξεκίνημα* [Start]). Xekinima was a leftist publication that first appeared in 1944 in Thessaloniki, at a time when the country was still under German occupation. It was created by a group of students belonging to the prestigious University Cultural Club (EOP)

---

17. To give a brief idea to non-Greek speakers, January can be spelt either as *Ιανουάριος* or as *Γενάρης*, but the most common change is the ending in *-ιος/-ης* (*Μάρτιος/Μάρτης*, *Ιούνιος/Ιούνης*, *Δεκέμβριος/Δεκέμβρης*, and so on).

supported by the United Panhellenic Organisation of Youth (EPON), the youth wing of the Greek National Liberation Front. The young fighters expressed their rebellion through the radical use of the Modern Greek language, as is clearly stated by Manolis Anagnostakis, one of the most eminent Greek post-war poets and main contributors to *Xekinima* (Varon, 1987). The spelling of 'October' on the cover as Οχτώβρης, instead of Οκτώβριος or Οκτώβρης, is indicative not only of their linguistic extremity but also of their support for communism.[18]

Another aspect we considered was the linkage between the data in our database and the sources, either the indexing essay or the source periodical, as it was not feasible to give immediate access to full texts. In addition to the fact that many of the sources are not yet digitised or that it is not possible to provide direct access since the file consists of an entire issue or volume, allowing such access would demand considerable effort. Nevertheless, immediate access to the sources was deemed essential, partly because a few elements were not included and because cross-checking has always been a desideratum in research practice. Thus, whenever there is access to an electronic resource, the URL is embedded in the title of the periodical.

The templated record displays the data and field labels for three features, namely cover date, volume/issue, and translator. The original title follows the title as it appears on the page in a smaller typeface, and the translator's pseudonym is distinguished using square brackets (see Figure 5).

Observations on How to Take Advantage of the Data

We need to provide specific numbers to obtain an idea of the size of our database and discuss some ways to make use of the data. As of July 2025, our spreadsheet has 22,000 records after indexing 146 prints (90 periodicals, 54 anthologies, and two supplements). This number is

18. By comparing the use of the two different spellings (*Οχτώβρης* instead of *Οκτώβρης*) in the digitised corpus of the newspaper *Ριζοσπάστης* [*Rizospastis*] (1917–present), the official newspaper of the Greek Communist Party (the years 1917–1983 are available by the National Library of Greece), the first one outscores the later (4353 over 4043). The results of the same query in a conservative newspaper like *Μακεδονία* [*Macedonia*] (1911–present) are overwhelming (554 over 27,546). See http://rg-dev.nlg.gr.

not insignificant considering that the database was launched in January 2024 and that all records have been added by hand (to ensure the quality of metadata) by a handful of volunteers. The amount of data constitutes only a small percentage of the translated literature published in Greek periodicals in the 19th and 20th centuries. Nevertheless, the diversity of the types of indexed periodicals and the inclusion of representatives of almost all periods[19] allow some initial conclusions. On the other hand, their heterogeneity demands closer scrutiny when we seek answers to more complicated enquiries.

The identification of authors allows the application of geospatial information, which is captured on a map, offering a macroscopic picture of the translation dispersion and translation representation of countries. First, we must clarify that the geographic/national classification of a translation is based on an author's nationality.[20] There are cases wherein authors hold dual nationality, write in multiple languages, or have been affected by changes in nations and states throughout history, where the degree of complexity increases. At times, we have had to make several methodological compromises and risked inaccuracy since only one value (nationality/country affiliation) is permitted by the visualisation tool. By analysing the data at hand, we have reached some already-known conclusions: French literature occupies the biggest space in Greek periodicals, followed by literature in German, British, Russian, and Italian (Figure 6).

Several research projects dictate grouping translation into larger categories (Caristia, 2020, p. 183), but we have found that, in our case, even a minimal representation of a country's literary tradition deserves to be highlighted. After the mid-20th century, and especially after the 1960s, the representation of works, mainly poetic, from South America (Colombia, Argentina, Chile, Peru, and Venezuela); Africa (including countries such as Madagascar, Senegal, and Algeria); or countries such as Haiti and Vietnam cannot stay unnoticed. The increased interest in the peripheral literatures can be interpreted through the lens of postcolonial theory (Bandia, 2016).

---

19. Admittedly, there are not many samples of the post-war era but many for the second quarter of the 20th century.

20. In libraries, we generally follow the simple DDC rule to class an author with the language in which the author writes and alter the classification when an author changes citizenship or adopts another language for their work.
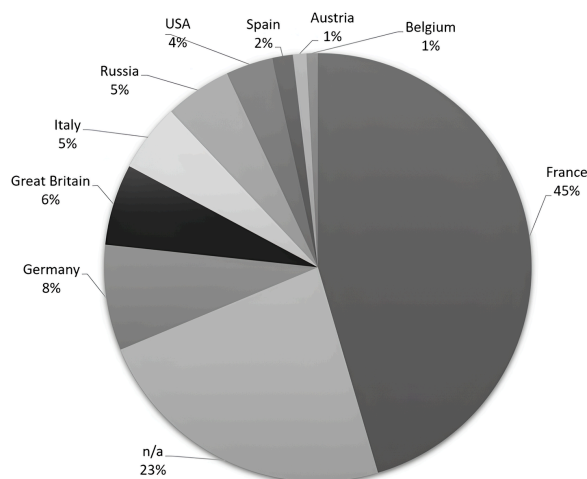
Figure 6 – Country representation. The unidentified authors and the anonymous works represent more than a quarter of all the translated texts.

Another element where the results of the database can be combined to lead to fruitful conclusions is the translator's presence. The translators' choices as mediators are significant and are dictated by their 'intellectual horizon' (Espagne, 2016, p. 61). A macroscopic analysis can only focus on the fact that most of the translations are unassigned, a common practice for translations in the press justified by factors such as the type of magazine (less common in little magazines than in miscellanies), the genre (poetry translators tend to sign their creations whereas novels often do not come with a translator's signature), the era, and the source text (especially when suspected plagiarism is involved).[21] Nevertheless, a closer look and synthetic queries can serve dedicated research needs.

Conclusion

We hope this first brief and general presentation provides an idea of our database's possibilities to a broader/international audience, despite the language barrier. Translations can enrich, empower, and even change the target language literary system. The collective data in Μετάdata may

---

21. We have also come to those conclusions in analysing *Bouketo*. Many researchers working on quantitative and qualitative analysis of magazine corpora describe similar observations (Popea, 2020, p. 136).

serve to determine whether, or at which point, Greek translations were a 'channel through which fashionable repertoire [was] brought home' or established a central position allowing agents 'to violate the home conventions' (Even-Zohar, 1990, p. 48, 50). In addition to this purpose, the data will allow researchers to look in reverse for the reception of foreign literature in Greece and estimate the dissemination of specific source literature beyond their borders and across time. The questions can be endless; we must keep feeding the need for carefully selected and organised data and, hopefully, map all Greek translations of literary texts exhaustively.

Acknowledgements

References

Bandia, P. (2016). Post-colonial literatures and translation. In Y. Gambier & L. van Doorslaer (Eds.), *Handbook of translation studies* (pp. 264–269). John Benjamins.

Bassnett, S. (2011). 9. Translation or adaptation? In *Reflections on Translation* (pp. 40–43). Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781847694102-011

Caristia, S. (2020). At the intersection of quantitative and qualitative: Propositions for a weighted analysis of translations in periodicals. In L. Fólica, D. Roig-Sanz, & S. Caristia (Eds.), *Literary translation in periodicals. Methodological challenges for a transnational approach* (pp. 175–202). John Benjamins. https://doi.org/10.1075/btl.155

Duff, D. (Ed.). (1999). *Modern genre theory*. Longman.

Espagne, M. (2016). Les transferts culturels et l'histoire culturelle de la Grèce. In A. Tabaki & O. Polycandrioti (Eds.), *Greek identity and*

alterity: Cultural transfer and 'national character' in 19th century Greece. (Vol. 2) (pp. 45–67). National and Kapodistrian University of Athens. Department of Theatre Studies/National Hellenic Research Foundation. Institute of Historical Research.

Even-Zohar, I. (1990). The position of translated literature within the literary polysystem. *Poetics Today, 11*(1), 45–51.

Fólica, L., Roig-Sanz, D., & Caristia, S. (2020). Towards a transnational and large-scale approach to literary translation in periodicals. In L. Fólica, D. Roig-Sanz, & S. Caristia (Eds.), *Literary translation in periodicals. Methodological challenges for a transnational approach* (pp. 1–17). John Benjamins. https://doi.org/10.1075/btl.155

Gentzler, E. (2017). *Translation and rewriting in the age of post-translation studies.* Routledge.

Gkogkou, D. (2023). *Το Μπουκέτο (1924–1946): ο ρόλος ενός περιοδικού ποικίλης ύλης στη διαμόρφωση του κοινού γούστου* [*Bouketo (1924–1946): the role of a middlebrow magazine in shaping readers' taste*] [Unpublished doctoral dissertation]. University of Patras. https://hdl.handle.net/10889/25678

Karaoglou, C. L. (1992). *Ο Διόνυσος [Dionysos] (1901–1902).* Diatton.

Kasinis, K. G. (2006). *Βιβλιογραφία των ελληνικών μεταφράσεων της ξένης λογοτεχνίας ΙΘ´-Κ´ αι.: Αυτοτελείς εκδόσεις: τ. 1. 1801–1900, τ. 2. 1901–1950* [*Bibliography of the foreign literature Greek translations 19th–20th centuries: Monographic publications*]. (Vols. 1–2). Syllogos Pros Diadosin Ofelimon Vivlion.

Nergaard, S. & Arduini, S. (2011). Translation: A new paradigm. *Translation.* Inaugural Issue, 8-17.

Popea, M. (2020). Shaping translation in two Mexican cultural magazines: A case study in the use of quantitative methods for the analysis of translation in periodical publications. In L. Fólica, D. Roig-Sanz, & S. Caristia (Eds.), *Literary translation in periodicals. Methodological challenges for a transnational approach* (pp. 121–151). John Benjamins. https://doi.org/10.1075/btl.155

Toury, G. (1995). *Descriptive translation studies and beyond.* John Benjamins.

Van Remoortel, M., Ewins, K., Koffeman, M. & Philpotts, M. (2016). Joining forces: European periodical studies as a new research field.

Varon, O. (1987). *Ελληνικός Νεανικός Τύπος (1941–1945): Καταγραφή* [*Greek Youth Press (1941–1945): Recording*] (Vols. 1–2). Historical Archive of Greek Youth.

Abstract

Translations scattered in periodicals and anthologies are valuable sources for understanding the shaping forces within the literary field of the target culture. However, while the translations attest to the dynamics of the source culture, their dispersion limits their validity. Μετάdata is a project that aspires to accumulate bibliographical data of all literary translations published in Greek periodicals and anthologies from 1801 to 1974 into one database. This article presents the steps we followed to implement the database and the various challenges we faced. The indexing relies mainly on secondary sources, and the fields used to describe the records have been customised to serve the database's needs. We present the visualisations implemented to make the data appealing to users and offer some possibilities to maximise its use.

Keywords

Greek periodicals; Literary translations; Looker Studio; Data visualisation; Periodical indexes

Unveiling the Medica Ecosystem: An Emblematic Example of Scientific Heritage Dissemination Services

Laurent Aucher and Olivier Ghuzel

Medica[1] is a set of online services dedicated to the promotion and dissemination of heritage collections in the history of health. Initiated 25 years ago, it now stands as a case study in sustainability for digital library projects with continuous service that has spanned major technological, organisational, and institutional shifts.

Facts and Figures

Today, Medica offers an extensive collection of digitised materials: 24,000 digitised books totalling 5.25 million scanned pages, 280,000 iconographic documents, 65,000 biographical notes, as well as four critical editions, 15 virtual exhibitions, and 14 partner sites enabling learned societies to establish a presence on the web. It is composed of three main services (Figure 1):

1. A digital library[2]
2. An image bank[3]
3. A biographical database[4]

In 2024, Medica attracted 117,000 visitors for a total of 1,050,000 page views. Nearly half of these visitors were from outside France, even though the interfaces are currently only available in French. The dissemination of our content on other platforms helps to increase its visibility. There were 326,000 page views during the year on the Internet Archive and, within the Wikimedia ecosystem, 21 million page views in 2024 included content from Medica.

---

1. https://numerabilis.u-paris.fr/medica/
2. https://numerabilis.u-paris.fr/medica/bibliotheque-numerique
3. https://numerabilis.u-paris.fr/medica/banque-images
4. https://numerabilis.u-paris.fr/medica/biographies
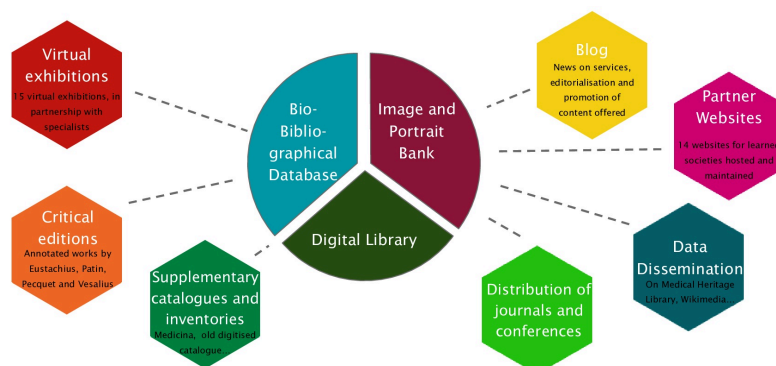
Figure 1 – Medica ecosystem.

In the context of French higher education, these figures are substantial, positioning Medica as a first-rate platform for knowledge dissemination, particularly in terms of data volume. This scale is largely due to Medica's longevity as the Paris Interuniversity Library of Health (*Bibliothèque interuniversitaire de Santé – BIU Santé*), with its staff of around one hundred, has operated with far fewer resources than major institutions such as the French national library (*Bibliothèque nationale de France*).

Historical Overview: Origins in the Late 1990s

Medica's origins trace back to the Interuniversity Library of Medicine (*Bibliothèque interuniversitaire de médecine* – BIUM), a successor of the mediaeval library of the Paris Faculty of Medicine. In the late 1990s, BIUM launched its digitisation efforts, leveraging decades of expertise in document photography. The library established its first website in 1999, alongside a pioneering virtual exhibition and the initial version of its image and portrait bank.

The following year, three years after the creation of Gallica,[5] the digital library was launched, taking advantage of the experience gained with the image bank, and the name Medica appeared. At the same time, the first partner sites emerged, and other small databases were made available to the public. The aim was to use the web to structure the documentary offering on the history of health around the library and to adapt to the anticipated decline in physical library visits.

5. https://gallica.bnf.fr

Late 2000s

In 2006, the Paris 5 University, which gives the library servers access to the web, rebranded itself and changed its name to Université Paris Descartes, leading to a change in the Internet domain name of Medica.

By the late 2000s, the number of partner websites increased, as did the number of collaborations with learned societies. An editorial function naturally emerged, namely putting the abstracts of journals published by these societies online.

A biographical database devoted to the history of healthcare was added to the core of the service package. This database aimed to make the most of the work carried out in-house to locate and analyse documents. It not only provided information on individuals but also – most importantly – listed sources to which researchers could refer.

2010s Growth and Partnership Evolution

In 2011, the BIUM merged with its sister library, the inter-university library of pharmacy, and it became the BIU Santé (Interuniversity Library of Health). For several years thereafter, the volume of databases and the number of digitised documents, partner sites and virtual exhibitions continued to grow.

Fruitful relationships were maintained with researchers, particularly through the provision of partner sites, collaboration on virtual exhibitions,[6] and publication of scholarly presentations[7] introducing the digital library's collections. These researchers did not hesitate to propose daring projects to the institution. The relationships led to the development of three online critical editions (a fourth is to follow in the 2020s),[8] which were distinguished by their critical apparatuses.

6. One example among others is *Beauty secrets: The cosmetic industry in France between know-how and science*, https://numerabilis.u-paris.fr/expositions/cosmeto/en/debut.htm

7. Among many examples is *Guillaume de Baillou*, https://numerabilis.u-paris.fr/medica/bibliotheque-numerique/presentations/baillou.php.

8. *La Fabrique de Vésale et autres textes*, https://www.biusante.parisdescartes.fr/vesale; *Correspondance complète et autres écrits de Guy Patin*, https://www.biusante.parisdescartes.fr/patin; *Jean Pecquet et la Tempête du chyle (1651-1655)*, https://www.biusante.parisdescartes.fr/pecquet; Bartolomeo Eustache,

The range of online services was also quite diversified. A blog was created to promote the services and better meet the needs of the users. The online communications strategy was fleshed out, structured, and deployed jointly on social networks, particularly on X (formerly Twitter).

Late 2010s

The system of partner sites began to slow down, and, taking advantage of the development of new tools and new hosting methods, several learned societies left the BIU Santé IT fold and launched independent websites. The range of data on offer continued to grow, and a new activity emerged: the dissemination of content on recognised platforms. Major partnerships were forged with the Medical Heritage Library (Boudon-Millot & Vincent, 2020) and Wikimedia (Benoist, 2020), leading to the full inclusion of Medica's digitised documents in the Internet Archive and targeted uploading projects to Wikimedia Commons and Wikidata, which are distinguished by the structuring of their metadata.

The end of this period also saw the completion of a major project, the online publication of the 'Métadictionnaire'[9] an interface for exploring old medical dictionaries using structured metadata derived from automated recognition of the lexical relations mentioned in these works, such as synonyms, translations and locutions. Following the example of online critical editions, this project was proposed by a researcher who was a regular user of Medica and familiar with the institution's activities and expertise.

Finally, around 2020, a major merger took place. The BIU Santé Library, Paris Descartes University, and Paris Diderot University joined forces to create a new institution, Université Paris Cité, which gave Medica a new graphic identity and governance, paving the way for its integration into a brand-new platform, Numerabilis.

Petit livre sur les dents (1563), https://www.biusante.parisdescartes.fr/eustache/debut.htm.

9. https://numerabilis.u-paris.fr/medica/bibliotheque-numerique/presentation-metadictionnaire.php

Challenges in a Nutshell: Technological Issues

It is difficult for a service package to stay afloat over a long period in a constantly changing environment. From a technological point of view, it would have been very surprising if the technical choices made in the 1990s were still all relevant today.

Apart from the adaptive maintenance through version upgrades that all IT construction undergoes, the programming language used at the origins of Medica has now been abandoned. This has led to applications being rewritten in languages that are still in use. Similarly, the choice of FileMaker database systems, which may have been suitable for modest projects in the 1990s, proved unsuitable for the scale Medica took on in the 2000s. Lastly, this development by successive accretions of services naturally has generated complications: redundancies have appeared (such as the multiplication of zoom systems among applications or the multiplication of different image formats), the increasing heterogeneity of data has made archiving more difficult, and, above all, documenting and maintaining knowledge of the service package has become a real challenge.

Beyond software engineering, the global technological environment has also changed considerably, and the development of online services and the emergence of global standards are leading to further obsolescence. Hosting partner sites in HTML, which was a useful proposition 20 years ago, has now been marginalised by the rise of site factories and other CMS hosted in the cloud. At the same time, the development of reference databases, supported by the widespread use of recognised identifiers (IdRef[10] in France, VIAF, Wikidata), is calling into question the redundancies created by the existence of local databases. New protocols such as IIIF are rendering obsolete the old ad hoc systems for zooming or displaying images online.

Organisational Issues

The institutional instability in French higher education must also be considered (Bézagu et al., 2019; Musselin, 2022; Aimé, 2023). The identity of the services offered on the web is itself being challenged. The names of the supervisory institutions and, consequently, the Internet domain name where the package of services is positioned have changed

---

10. https://abes.fr/reseaux-idref-orcid/outils-et-services-autorites/plateforme-idref/

several times over 13 years (e.g. bium.univ-paris5.fr, bium.parisdescartes.fr, biusante.parisdescartes.fr, u-paris.fr). We have learnt that the services and missions offered to the public live longer than the administrations that manage them and that, to develop their reputation over the long term, it can be useful to give these services a distinct name.

These institutional developments are also changing the composition and versatility of the teams. The BIU Santé used to be an autonomous establishment, which had to manage – in good times and bad – Medica in all its aspects (documentary policy, communication strategy, IT maintenance, provision of infrastructure, digitisation capabilities, and signing of agreements with partners). This management required teams to be highly versatile. Integration into a larger structure, the Université Paris Cité, has profoundly altered scopes of responsibilities. Teams are becoming more specialised, and there is less intermingling of different professions.

The pooling of resources at the university level solves some of the problems mentioned, such as the difficult maintenance of the technical infrastructure, for example, but it also brings its own challenges: more complex decision-making processes and dispersal of expertise across different departments slow down the conclusion of partnerships and the launch of new projects, and pooled communication tools and media limit the specificity and agility of communication around Medica.

Achievements Beyond the Obstacles

These challenges can provide considerations about the long-term management of this kind of construction. However, it would be misleading to stop there. The efforts made to enable Medica to triumph over these obstacles are fully justified, and the overall results are positive.

The figures provided at the beginning of this paper show that these services are being used. They are also recognised and have enabled their parent establishments to obtain official recognition, including the

Culture Libre label,[11] the Plottel prize,[12] and subsidies from national programmes.

They have helped to forge long-term relationships between librarians and researchers, as well as with other institutions, both nationally and internationally. In turn, they have sparked new projects and partnerships.

Looking Forward: Integration into Numerabilis

In 2023, the Department of Libraries and Museums at Université Paris Cité launched a project to develop Numerabilis. This university-wide digital library ecosystem has been scheduled for launch in 2025, and it will integrate and extend the services offered at Medica beyond its disciplinary perimeter.

Numerabilis will have to be sustainable and technically extensible; it will have to enable the editorialisation of resources, raise the profile of collections, and promote research on them. It will make possible the publication of new collections from a variety of disciplines beyond medical sciences: (hard) sciences, societies, and humanities. New types of resources will be published, including museum collections, objects, archives (both scientific and administrative), and audiovisual materials. The Museum of History of Medicine in Paris, for example, will soon be equipped with a collection management tool, and its data will be harvested by the platform to create a public catalogue.

The future platform is based on open technologies and standards. The Omeka S software (developed by Digital Scholar) is the central building block, combined with the Solr search engine, Cantaloupe IIIF server, and Mirador viewer.

Following the principles of the Web of Data and in the interest of future-proofing, metadata will be described exclusively using RDF vocabularies

---

11. The Culture libre ('Free [or Open] Culture') label, created by Wikimedia France, is awarded to cultural and scientific institutions that have taken the initiative of opening up their heritage holdings (digitisation of works and documents) under open licences and integrating collaborative digital practices into their missions. See https://www.wikimedia.fr/label-culture-libre/.
12. The Plottel Prize, awarded by the Académie des inscriptions et belles-lettres, is intended to encourage high-level work in the field of classical studies. See https://aibl.fr/prix/prix-plottel-pour-les-etudes-classiques/.

and will be enriched from global authorities' repositories (IdRef and more).[13]

To date, the target architecture has been defined, the new infrastructure has been set up, and the data model and mapping have been outlined. The coming year will see all the stages unfold. These changes will start with the transfer of the Medica ecosystem's applications, services, and data to the new infrastructure hosted by the IT department of the university.

Thereafter, Medica data will be migrated and enriched in Omeka S. New collections, such as serials and museum objects, will be added in parallel. A major task will be to create a front end that complies with current web standards and the university's graphic identity. Finally, all workflows, from resource selection to digitisation, publishing, and promotion, will be reviewed to ensure maximum consistency.

Conclusion

Medica's trajectory over the last 25 years illustrates the complexity of managing a long-term digital asset project in a constantly changing technological and institutional landscape. With its integration into the Numerabilis platform, we expect that Medica's resources and contributions will be extended in a broader, interdisciplinary framework. We hope that this example of Medica's development offers a practical perspective on the sustainable management of documentary heritage services offered to the public.

References

Aimé, P. (2023). L'impact du processus d'autonomie des universités sur la place des BU dans les politiques et les stratégies d'établissements. In Rédaction du BBF (Ed.), *2023. Bibliothèques, objets politiques* (pp. 82-88). Bulletin des bibliothèques de France. https://shs.cairn.info/bibliotheques-objets-politiques–9782492897023-page-82

Benoist, D. (2020, January 30). *La BIU Santé et l'accès à la connaissance.*

---

13. Since the IdRef repository is the pivotal identifier system prescribed in French higher education, it is our priority to align our data with it; this task is nearing completion. We are also considering alignments with Wikidata.

Wikimedia France. https://www.wikimedia.fr/la-biu-sante-et-lacces-a-la-connaissance-libre/

Bézagu, P., Bordry, G., Rossignol, J.-L., & Perrey, P. (2019). *Premier bilan des fusions d'universités réalisées entre 2009 et 2017. Tome 1. Rapport à madame la ministre de l'enseignement supérieur, de la recherche et de l'innovation* (No. 2018-121). Inspection générale de l'administration de l'éducation nationale et de la recherche. https://www.education.gouv.fr/premier-bilan-des-fusions-d-universites-realisees-entre-2009-et-2017-41180

Boudon-Millot, V., & Vincent, J.-F. (2020). Medical Heritage Library – La plus grande bibliothèque médicale numérique du monde. *Médecine/ sciences*, *36*(10), 924-928. https://doi.org/10.1051/medsci/2020162

Musselin, C. (2022). *La longue marche des universités françaises*. Presses de Sciences Po. https://doi.org/10.3917/scpo.musse.2022.01

Abstract

Medica is a long-standing digital library dedicated to the dissemination and preservation of heritage collections in the history of health. Established over 25 years ago, it serves as a case study in sustainability for digital library initiatives, adapting to technological, institutional, and organisational shifts. The platform provides access to 25,000 digitised books, 280,000 iconographic documents, and a biographical database of 65,000 entries. Over the years, Medica has expanded its services and content and developed scholarly partnerships.

Medica has faced significant challenges, including evolving software infrastructures, shifting institutional affiliations, and the increasing complexity of maintaining interoperability with global databases and web standards. Despite these obstacles, its contributions have been widely recognised, fostering collaborations between researchers, librarians, and cultural institutions.

Medica is currently undergoing a major transformation with its integration into Numerabilis, a new interdisciplinary digital platform at Université Paris Cité. This transition leverages open-source technologies, linked data principles, and advanced metadata management to ensure long-term sustainability. The new ecosystem will extend Medica's scope beyond medical sciences, incorporating diverse heritage materials such as museum collections and audiovisual archives.

Medica's evolution highlights both the challenges and opportunities in sustaining digital heritage initiatives within an ever-changing landscape. Its journey offers valuable insights into the resilience and adaptability required for long-term digital resource management.

Keywords

Academic libraries; Heritage collections; Digitisation; Digital library; Data dissemination; Health history

Early European Books: The Role of Private Partnerships in Heritage Preservation

Francesca Petricca

In the context of cultural heritage preservation, questions regarding the role of private institutions in the conservation and dissemination of such heritage and whether preservation can be considered a business remain important. This paper examines these questions from a private company standpoint. We will use the example of the Early European Books (EEB) project curated by ProQuest. This project started officially in 2009, as the ideal extension of its cognate programme, Early English Books Online, which began almost 90 years ago in 1938. Today, this global endeavour is known under the name of Early Modern Books, and it allows scholars to view materials from over 225 source libraries worldwide. EEB contains, to date, records on 78,556 editions printed between 1450 and 1700. The actors involved in this project are ProQuest; the Universal Short Title Catalogue at St Andrews University; and five major European collections, namely the National Library of France, the National Library of the Netherlands, the Royal Danish Library, the National Central Library in Florence, and the Wellcome Library in London. In 2025, two new source libraries will join the EEB project, The British Library and University College London.

  In a paper published in 2021, Andrew Pettegree and Artur der Weduwen portray the framework of the partnership between ProQuest and the Universal Short Title Catalogue (USTC) (Pettegree & der Weduwen, 2021). The study discusses the parallel destinies of Alfred Pollard and Eugene Power, whose efforts led to the birth of Early Modern Books. In 1918, Alfred Pollard, curator of the British Museum, had the initial idea of creating a checklist of all the books published in Great Britain during the first two centuries of printing. The memories of the fear caused by German bombs falling from the sky were still fresh. If these early print treasures were to be lost, at least an inventory of the books would be useful in recreating the collection. The Short Title Catalogue (STC) initiative came out of this idea and was completed in 1927. Although it inspired other similar initiatives, the STC remained the core of what is known today as the English Short Title Catalogue (ESTC). A short title catalogue is a list of printed works designed to identify editions,

typically including a variety of bibliographical information, including the shortened version of the title, publication information ('imprint'), subject headings, genre terms, pagination and format, and references to other catalogues. On the other side of the Atlantic Ocean, Eugene Power, the founder of University Microfilm International (UMI), the company known today as ProQuest, pioneered a microfilm industry that was applied to scholarly work (Pack, 1994; Pennavaria, 2015). The idea was to remove physical barriers to research, facilitate access to information, and reveal meaningful content. The imminence of World War II and the threat hanging over the masterpieces in the British Library accelerated the need to create manageable copies of the collections. Eugene Power sailed to London to capture in microfilms the books listed by Pollard a few years before. Early English Books Online was born and with it, a new concept of business and heritage preservation emerged (Gadd, 2009).

Today, Early English Books Online includes over 150,000 titles which represent 98% of the ESTC and is the most comprehensive collection of early printed books available to the scholarly world. The impact of EEBO in the preservation landscape has been a major one, and the project has stimulated heated debates in the scholarly community. While many historians have underlined its limits, others recognized its major contribution in the field of computational humanities and quantitative research (Gavin, 2017, 2021; Herman, 2020; Kichuk, 2007). EEB is a cognate project which aims to preserve European collections, in an age where digitisation methods have evolved sufficiently to capture the entire book – cover to cover – in full colour and to film fragile works with care. The endeavour of covering continental early printed books, however, is larger and more complex than surveying the English press. ProQuest has been working with the USTC since 2009, and a consultancy partnership began in 2015. The USTC, based at St Andrews University since 1995, is a bibliography of books printed between 1450 and 1700 worldwide. Expanding the ESTC, the USTC includes European prints by physically visiting libraries in Europe and meticulously examining the catalogues onsite. The cooperation between ProQuest and the USTC is pivotal to establishing a roadmap for digitisation and developing metadata. In 2024, ProQuest released the 25th collection of EEB. The collections are the units used to organise and commercialise EEB, and each collection contains substantial holdings from one or more libraries (Kibble, 2011). Collections 1 to 10 are comprehensive and can be considered as the foundation of the project because they contain over 60,000 titles.

Collections from 11 onwards are smaller and thematic to align with faculty subjects, and USTC subject tags are used to create the themes.

The Publisher Workflow and the Role of Metadata

Each partner library part of the EEB project enters into a legal agreement with ProQuest, whereby the library is remunerated through the payment of royalties calculated on subscriptions to the collection. To date, ProQuest has agreements with the five above-mentioned libraries that have been selected for the relevance of their collections. Once the agreement is signed, ProQuest and the partner library select the supplier in charge of the books' digitisation. First, a preliminary study is conducted with the library and the supplier to prepare the digitisation, which is followed by a negotiation with the library on the terms of delivery of the books. The working conditions are regulated in every minute aspect by the contract concluded between the parties e.g. on the daylight exposure and the hours worked per day, and humidity insurance is stipulated to protect the collections.

The scanning lab is set up in the library premises to minimise the risks for the collections and facilitate any interactions required with the library staff. The pages are turned manually as the books come in many different sizes. Since some pages are folded and some books have a very tight binding, a cradle is used to open the books at a 45° angle to maintain their integrity. The spine, cover, and edges of the books are captured to give the user a sense of being in the presence of the book.

ProQuest creates a list of the titles in MODS format that is sent to the digitisation partner. The list is generally based on the original MARC records from the source library (if available). The supplier returns the data after digitisation; these are MODS records stored in METS.[1] The data is sent via FTP or hard disk, depending on the supplier, along with the scanned images of the book. In addition to bibliographic information, the file provides details of the equipment used in the digitisation process at the level of each page. Page features, such as coats of arms, illuminated letters, and manuscripts, are highlighted in the code describing each page. For work identification, links to VIAF and HPB Database are added

---

1. MODS stands for Metadata Object Description Schema (https://www.loc.gov/standards/mods/mods-overview.html) while METS stands for Metadata Encoding & Transmission Schema (https://www.loc.gov/standards/mets/METSOverview.v2.html).

to obtain a standard version of the author's name. These links are added manually by the ProQuest team in the Cambridge (UK) offices.

The enhanced metadata are the main value provided by ProQuest. The EEB project aims to improve the discoverability of the works through enriched metadata, make unknown materials available to scholars, and reveal connections between works that have not been considered previously. Most libraries digitise their fragile books as part of a conservation and dissemination remit. They either make them available themselves on library websites or share them with a wider community with a minimum of metadata. ProQuest-enhanced metadata allows the retrieval of known items using keywords, author names, and titles, and they grant the discovery of new volumes via USTC subject terms, page features, and source libraries. Every book has an identifier that has been added to the items in EEB. As of today, the USTC features 39 themes.

Currently, scholars who are looking for a specific item will most likely find versions of the books/volumes on the web as scattered content or part of digitised collections, but those who are still formulating their cognitive questions will find the metadata an essential tool in their research. ProQuest-enhanced metadata offers extensive opportunities not only to identify a book but also to get an idea of the landscape of research on different topics in Europe. These features allow users to properly assess the context of a topic and the other works that could be on a continuum of output from the Early Modern period. This functionality is possible due to the dimensions of Early Modern Books, a resource that represents one of the biggest corpora of content from a historical period and that covers a large region from Scandinavia to Spain.

Women in Publishing and Inclusive Metadata

The unique features of EEB and the cooperation with the USTC have made it possible to conduct new research and build a more inclusive scholarship. One of the most significant examples is the creation of the indexation subject 'women in publishing' in 2021.[2] The debate on the ability of metadata to influence and bias research is a long-standing issue, first documented in 1971 by Sanford Berman in the

---

2. Refer to this blog entry, published at the time of the launch of the *Women in Publishing* initiative in 2021: https://pq-static-content.proquest.com/collateral/media2/documents/brochure-eeb-discoverwomenprinters.pdf.

monograph *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People (P&A)*. Classification and creation of metadata have never been neutral acts. In more recent times, representing diversity and establishing cataloguing ethics has become a necessity and gauge of scholarly integrity.[3] The attribution of gendered metadata to the collections contributes to the representation of traditionally marginalised groups, such as women, and ultimately sheds light on different aspects of social life in early modern Europe. Elise Watson's paper on the early modern period states that reassessing metadata can provide new perspectives in the study of printing and publishing (Watson, 2024).

Women played a far more important role in the book industry than is acknowledged by the imprint data on the books. Female authors, such as Margaret of Navarre, belonged to families of the elite where there was a greater chance of an excellent education. In contrast, it was far easier for non-aristocratic women to contribute to the book world as producers rather than as authors. Since almost all print shops were a family business, the wife would frequently act as business manager. If they outlived their husbands, women could step out of the shadows and print under their own names.[4] The same was true in families without male heirs, where the daughters became the business successors and ran the firms. Indeed, women often used their late husbands' or fathers' names, but the USTC aims to include the given names of the female printers when it is possible to find them via archival research (Watson, 2024). Labelling books mentioning widows and heirs is one of the best practices to acknowledge the work of women in the book industry. As of February 2025, 1,823 works have been tagged under the USTC subject classification 'women in publishing' in EEB and 4,421 in Early English Books Online, representing almost 3% of the entire catalogue. This tag captures women engaged in the publishing and printing trade as listed on the imprints or colophons of early printed books. It provides insights into the many different roles women played in the book trade, not only in the print shop but also in management and bookselling. This endeavour can be seen as the first step in a new way of treating metadata. The USTC's Elise Watson talks about feminist bibliographical

---

3. A meaningful and comprehensive contribution on cataloguing ethics is provided by Jennifer Martin (2021).

4. For further information on early modern women printers – with particular attention to sister printers – refer to: https://www.ustc.ac.uk/news/sorority-before-sororities-early-modern-sister-printers.

data.[5] The recognition of women's role in publishing paves the way for the acknowledgement of other marginalised groups. In addition to the printer, publisher, editor, and author, who are well known, the binder, compositor, seller, illustrator, translator, pressman/woman, compiler, dedicatee, and papermaker are also important. If represented in this way, the making of a book becomes a collective and communal process. Thus, acknowledging the full working team goes beyond the binary distinction between men and women and shapes a more faithful image of the workforce in the book industry in the early modern era. Metadata are far from being neutral; they reflect the intentions of the cataloguer and determine the interpretative framework in which early printed books are read. The more information we can add to describe a document, the more information we will be able to provide to scholars investigating the period.

Preservation reaches its peak when it brings together curation, dissemination, and discovery. The partnership between public libraries and private stakeholders can prove reliable despite having commercial goals if conducted accurately and transparently. ProQuest's EEB project aims to contribute to the debate around the printed output of the early modern era and propose a collaborative approach to heritage preservation.

Conclusion

The EEB project exemplifies how private–public partnerships can contribute to the preservation and dissemination of cultural heritage while balancing commercial imperatives with scholarly objectives. By leveraging enhanced metadata and digitisation technologies, ProQuest and its partners have expanded access to early printed materials, enabling more comprehensive research opportunities. The inclusion of gendered metadata and recognition of historically marginalised contributors illustrate the evolving role of cataloguing in shaping historical narratives. Ultimately, this study underscores the importance of meticulous curation and collaborative efforts in safeguarding early modern printed heritage. Thus, the study demonstrates that commercial initiatives can, when managed transparently, serve the broader interests of academia and cultural conservation.

5. Watson refers to Kate Ozment's work on 'Feminist Bibliography'; see https://www.youtube.com/watch?v=razNzIQXUqE.

References

Gadd, I. (2009), The use and misuse of *Early English Books Online*. *Literature Compass*, *6*(3), 680–692. https://doi.org/10.1111/j.1741-4113.2009.00632.x

Gavin, M. (2021). EEBO and us. *Textual Cultures*, *14*(1), 270–278. https://www.jstor.org/stable/48647122

Gavin, M. (2017). How to think about EEBO. *Textual Cultures*, *11*(1/2), 70–105. https://www.jstor.org/stable/26662793

Herman, P. C. (2020). EEBO and me: An autobiographical response to Michael Gavin, 'How to think about EEBO'. *Textual Cultures*, *13*(1), 207–216. https://www.jstor.org/stable/26954245

Kibble, M. (2011). Sponsored article: ProQuest's *Early European Books* project: A collaborative approach to the digitisation of rare texts. *LIBER Quarterly: The Journal of the Association of European Research Libraries*, *20*(3-4), 372–381. https://doi.org/10.18352/lq.8003

Kichuk, D. (2007). Metamorphosis: Remediation in *Early English Books Online (EEBO)*. *Literary and Linguistic Computing*, *22*(3), 291–303. https://doi.org/10.1093/llc/fqm018

Martin, J. M. (2021). Records, responsibility, and power: An overview of cataloging ethics. *Cataloging & Classification Quarterly*, *59*(2–3), 281–304. https://doi.org/10.1080/01639374.2020.1871458

Pack, T. (1994). UMI—History in the making. *Library Hi Tech*, *12*(3), 91–100. https://doi.org/10.1108/eb047931

Pennavaria, K. (2015). Genealogy gems: The evolution of ProQuest. *Kentucky Libraries*, *79*(1), 18–19.

Pettegree, A., & der Weduwen, A. (2021). *Proquest's Early Modern Books: A celebration*. ProQuest. https://pq-static-content.proquest.com/collateral/media2/documents/article-earlymodernbooks-celebration.pdf

Watson, E. (2024). Queering the language of dynasty in imprints and bibliographic metadata. *The Papers of the Bibliographical Society of America*, *118*(2), 223–243. https://doi.org/10.1086/730317

Abstract

This paper examines the role of private institutions in the preservation and dissemination of cultural heritage, with a particular focus on the Early European Books (EEB) project led by ProQuest. Originating as an extension of Early English Books Online, EEB has evolved into a global initiative aimed at digitising and cataloguing early printed materials from major European collections. Through partnerships with institutions such as the Universal Short Title Catalogue (USTC) and prominent libraries, this project enhances scholarly accessibility to rare texts while maintaining rigorous digitisation and metadata standards. The study highlights the significance of metadata enrichment in facilitating research and fostering inclusivity, particularly through the indexing of traditionally underrepresented contributors, such as women in publishing. By examining the intersection of commercial enterprise and heritage preservation, this research underscores the potential of public–private collaborations in advancing academic scholarship and ensuring the longevity of early printed materials.

Keywords

Part III

Promoting and Showcasing
Heritage Collections

The Digital Library of Latvia and Collaborations With Regional Libraries

Eva Ausēja

The Digital Library

The digitisation of Latvia's cultural heritage has been a complex and multifaceted process conducted to preserve and make accessible the nation's rich cultural history in digital form. The aim of this article is to provide insight into the unified Latvian digital cultural heritage platform, the Digital Library,[1] highlighting its diverse content and the involvement of regional libraries in content enrichment and synergy. The first digitisation activities in Latvia were undertaken in 1994 (Bandere & Ķikāne, 2024); since then and until mid-2024, the activities of various cultural institutions have led to the development of individual digital collections and numerous information systems, as well as facilitating cooperation between Latvian cultural institutions. The creation of a unified, integrated national digital cultural heritage infrastructure is a logical continuation of this development. Influential in the development of this single platform were two projects co-funded by the European Regional Development Fund (ERDF) and the state and the readiness of the cultural heritage sector to create a single platform for preserving Latvia's digital cultural heritage (Bandere & Ķikāne, 2024). The DCH platform (Figure 1) was developed on the basis of the existing infrastructure of the National Library of Latvia, including a unified Digital Object Management (DOM) system for the long-term preservation of digital objects, a reference data system and a copyright management and licensing system, as well as the Digital Library that facilitates unified dissemination of digital cultural heritage objects and information retrieval. The Digital Library has reached 100,000 users in its first year of operation since its launch on 26 October 2023, with more than 1 million views on the website. It provides access to images, documents, periodicals, books, maps and other materials collected by archives, museums, libraries, organisations, communities and individuals in Latvia. The library's content is continuously updated, with the goal of unifying all of Latvia's cultural heritage content into a single search system, regardless

1. https://digitalabiblioteka.lv

of the creator or custodian – be it a cultural, educational or scientific institution or a private individual (Bandere & Ķikāne, 2024).
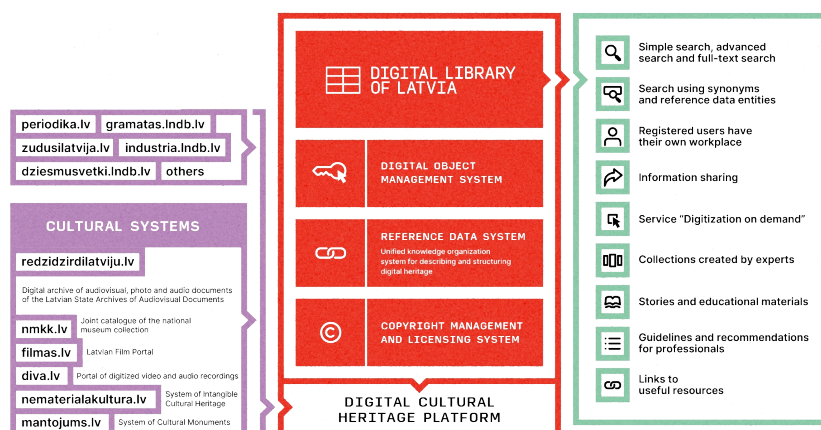
Figure 1 – The systems, content and services of the DCH platform. Designed by Toms Vilītis (About the Digital Library, 2023).

The Digital Library is based on four unifying guiding principles (Figure 2):

1. The needs and requirements of the content users come first. The Digital Library unifies collections and breaks down institutional boundaries, providing users with unified access to Latvia's cultural heritage;
2. The Digital Library brings together authentic historical sources and ensures the broadest and correct access to Latvia's cultural heritage;
3. The Digital Library harnesses technological possibilities to make content more accessible and easy to use and thus sustains Latvia's cultural heritage;
4. The success of the Digital Library is based on the cooperation and contribution of partners, each sharing their knowledge, experience and resources (About the Digital Library, 2023).

The Digital Library is an important contribution to the preservation and accessibility of Latvia's cultural heritage; it promotes research, education and cultural understanding and opens up new possibilities for the preservation and interpretation of cultural heritage. It is a valuable resource for researchers, students, teachers and anyone interested in Latvia's cultural heritage.
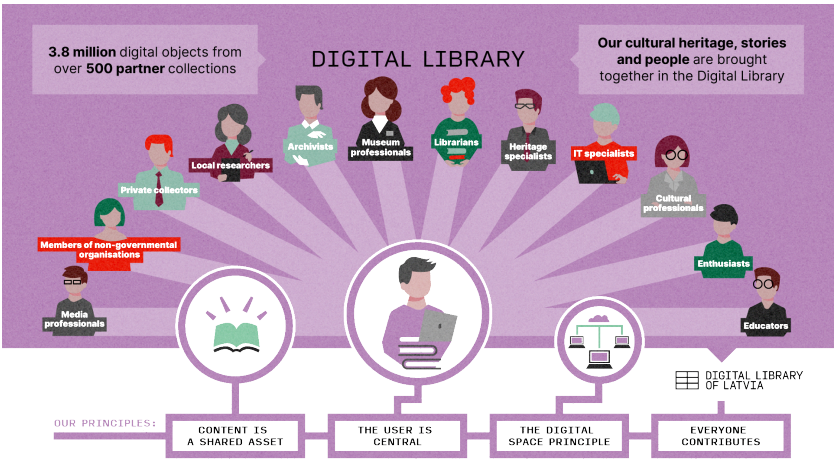
Figure 2 – The guiding principles of The Digital Library. Designed by Toms Vilītis (About the Digital Library, 2023).

Content Synergy

The Digital Library showcases more than 3.8 million digital objects from more than 650 partners. The content is grouped into five categories – texts, images, videos, audio and museum objects, including periodicals, books from the 17th century to the present day, maps, sheet music, ephemera from the National Library of Latvia (NLL); text documents, photographs, audio and video recordings from the Latvian National Archives (LNA); museum objects from various Latvian museums, intangible cultural heritage listings, surveys of cultural monuments, including 3D models from the National Heritage Board; and Latvian Television and Latvian Radio recordings, films produced in Latvia and digital art archives. The Digital Library also includes the Electronic Union Catalogue of Latvian Libraries of National Significance.

Cooperation among different cultural institutions, such as the NLL, the LNA, the National Heritage Board, museums, regional partners and other organisations, is essential to ensure greater access to and diversity of the cultural heritage content. Each institution's collections contain a unique and diverse range of materials, and the Digital Library's different collections form a content synergy of Latvia's digital cultural heritage, offering researchers and the public the opportunity to reinterpret the content. For example, the National Heritage Board has uploaded and

offers access to digitised monument files, surveys, measurements,[2] photographs, 3D objects and other documents[3] from all over Latvia, including Talsi. However, the regional partner Talsi Main Library's Talsu Local History Collection[4] houses testimonies donated by residents: photographs, manuscripts, audio and video recordings, as well as the photographic collection of the bibliographer and photographer Jānis Tāle (1902–1983), which documents the buildings, monuments and other cultural objects of Talsi. This collection is a valuable addition for researchers, teachers, students and the general public alongside the National Heritage Board's monument collection, providing a diversity of materials and contributing to Latvia's overall cultural heritage.

The content of each regional partner's collection is different; for instance, the Gulbene Local History Collection,[5] created by the Gulbene Regional Library, reflects the history, people, cultural and historical monuments and events of the Gulbene region since the late 19th century until the present day, revealing the rich cultural heritage of the region. It contains materials on Alfrēds Gāters (1921–1986), the Latvian linguist, literary scholar and doctor living in exile. Gāters wrote on linguistic issues and published several reviews of books by Latvian exile authors in exile newspapers (Alfrēds Gāters, n.d.). Although the bulk of Gāter's estate – 3,000 books and around 3,000 letters – was bequeathed and ended up in the collection of the University of Hamburg (Kalējs, 1987), the Gulbene Local History Collection contains photographs and evidence from the linguist's childhood and school years in the Gulbene district, as well as some coverage of his exile years in Hamburg. Still, the A. Gātera collection in the Gulbene Regional Library has not yet been fully digitised.

The Digital Library houses materials not only about the linguist from the Gulbene Regional Library, but also from Latvian Radio, the National Library of Latvia and other partners. The Latvian Radio programme 'Tēvu laipa šaizemē' (Stroda, 1999) tells the story of Gāters' life in Stāmeriena in the Gulbene district and his life in exile in Germany. In the NLL collection, one can read Gāters' articles and also articles about him in the exile newspapers *Latvija*, *Latvija Amerikā*, *Laiks* and other

2. https://digitalabiblioteka.lv/?col=903552

3. https://digitalabiblioteka.lv/?col=102447

4. https://digitalabiblioteka.lv/?col=1063807

5. https://digitalabiblioteka.lv/?col=1061905

publications. The synergy among the diverse range of materials from the partners provides greater insight into the life of this linguist, promoting more detailed research and interpretation. The collaborative efforts of regional partners in enriching the Digital Library contribute to the integration of Latvia's cultural heritage within the broader European and global digital cultural landscape.

Continuing the analysis of available materials and information about the exiled linguist Alfrēds Gāters in a European context, 89 bibliographic records and a digitised book by the author have been found in the Hamburg University catalogue.[6] It is possible that an additional collection of non-digitised documents and photographs is located in the Latvian Society in Hamburg.

The Digital Library's partners, collections and materials cover various aspects of Gāters' life (both his works and biographical data), creating a broader picture of his life and legacy. The material available on Gāters in Latvia and Europe is fragmented across different institutions, but together it paints a broad picture of different aspects of his life and work.

A global example can be found in the Digital Library's collection of Radio Free Europe/Radio Liberty Recordings,[7] which comprises 520 audio recordings made at the end of the 20th century, reflecting political events and changes in Latvia and globally, as well as cultural and social developments in the Latvian diaspora. The recordings were made in exile; historically, for various reasons, some of the physical recordings – audio cassettes and magnetic tapes – were sent to Latvia and are located in two different institutions, the NLL and the LNA, and a third part of the recordings are held at the Hoover Institution Library and Archives in the United States. Cooperation among these institutions allows these separate sections of the physical recordings to be preserved and ensures that the recordings are available in the digital space as a unified collection, both in Latvia and internationally. Such cooperation enables a global perspective on local and diaspora events, rendering them with greater context and value. The Digital Library's capabilities allow for the effective pooling and dissemination of material from different regions, providing international access to and understanding of historical and cultural events.

---

6. Retrieved March 1, 2025, from https://katalogplus.sub.uni-hamburg.de/vufind/Search/Results?lookfor=alfreds+gaters&type=AllFields&searchbox=1&limit=20

7. https://digitalabiblioteka.lv/?col=70240

The number of partners continues to grow steadily as more and more organisations and private collection holders add their content to the Digital Library. For example, the diversity of partners is illustrated by the collaboration of organisations such as the Association of Dramaturgs, the World Association of Free Latvians, the New Media Culture Centre RIXC, the Latvian Radio and the Institute of Literature, Folklore and Art at the University of Latvia. The content provided by the 650 partners of the Digital Library allows users to explore Latvia's historical and cultural treasures from the perspective of cultural heritage institutions, non-governmental organizations and private collections. The following sections of this article describe in greater detail the cooperation with regional partners, mainly focusing on regional libraries and their involvement in supplementing the Digital Library with local historic materials and other content.

The Involvement of Regional Libraries in Content Development

Each institution's collection is unique and, together with the resources of other content providers, diversifies and adds to Latvia's cultural heritage. Regional libraries and museums in Latvia are important custodians of regional cultural heritage, preserving local history, culture and traditions that are specific to a particular region and thus fostering a sense of belonging and helping shape a nation's identity. They also provide access to information, support lifelong learning and serve as community centres. The long-term preservation, management and accessibility of the collection in the digital environment is an objective of the *Latvian Library Sector Strategy 2023–2027*. The sector is clear in stating that 'Cultural heritage digitised with state and municipal funds should be preserved in a unified manner on the digital cultural heritage platform and accessible in the Digital Library (digitalabiblioteka.lv)' (Ministry of Culture, 2022, pp. 9–10). To meet the strategy objective, regional libraries will need to work on digitising their collections and ensuring that Latvia's digitised cultural heritage is preserved in a unified manner on the DCH platform and accessible in the Digital Library.

In addition to compiling annual statistics for Latvian libraries, in 2022, the NLL conducted in-depth research and analysed digitisation volumes and current practices in the main regional libraries (National Library of Latvia, 2022). The NLL also visited regional libraries to discuss the challenges and benefits of starting to store their content on the DCH

platform and to agree on potential opportunities for cooperation. The main benefit for regional partners starting work on the DCH platform is the possibility to use the free infrastructure that has already been developed and ensures the preservation and presentation of content in perpetuity, while the biggest challenge is the lack of knowledge and experience in digitising and preserving digital content. This situation highlights the need for further education and support to help libraries overcome digitisation challenges and to make effective use of the opportunities offered by the DCH platform.

The survey data indicate a wide range of digitisation practices among regional libraries (Figure 3). While there is some overlap in their activities, such as in the creation of virtual exhibitions, there is a significant degree of variation in how they handle the description, preservation and accessibility of digital objects.
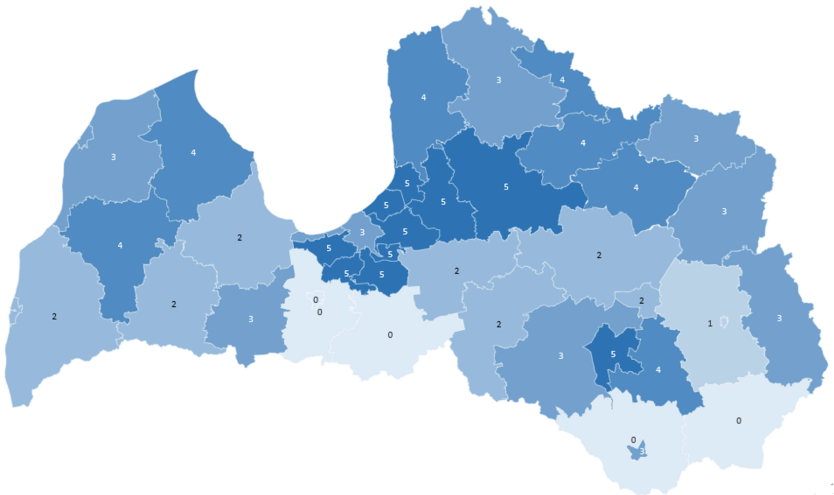
Figure 3 – Digitisation in the main regional libraries, 2022 survey data (0 = No data; 1 = Do not digitise; 2 = Plan to start digitisation; 3 = Perform digitisation ; 4 = Verbal digitisation strategy; 5 = Have a digitisation strategy).

By identifying the needs, desires and challenges of regional libraries, the NLL was able to accurately determine and tailor the services and training provided. These services and training are adapted to the specific digitalisation practices of each region as needed. The results of the research show that regional libraries have the content – local history materials, recordings of events, and so on – the human resources and the equipment to be able to digitise their collections, but not digitisation

experience and expertise, the infrastructure to store the digitised content or the funding to develop digital collections and display systems. Regional libraries have long been compelled to find different solutions to overcome these challenges. The DCH platform enables regional libraries to use the existing infrastructure to securely preserve their content and offer quality content presentation opportunities (Ausēja, 2023). The unified DCH platform provides a framework for standardising the different digitisation practices of regional libraries, as well as enabling them to preserve, display and promote their digital content in one place. The establishment of a unified national-level infrastructure for preserving Latvia's digital cultural heritage has been a significant step forward for regional libraries as well. The changes have necessitated a wide range of training to enhance digital skills, including metadata creation, collaboration with various systems, digitisation practices and copyright management. Since late 2022, the regional collections on the unified DCH platform have gradually grown, thanks to successful collaborations and training initiatives.

Knowledge Transfer: Regional Centres of Excellence

At the end of 2022, only a few regional libraries saw more opportunities than challenges in starting to preserve their collections on the DCH platform and presenting them in the Digital Library. Gradually through consulting and learning, more and more regional libraries became aware of this opportunity and wanted to get involved by preserving and presenting their unique content on the DCH platform.

The national-level planning document *Digital Transformation Guidelines 2021–2027* (Ministry of Environmental Protection and Regional Development, 2020, pp. 20-22) emphasises that strengthening knowledge and skills in the digital sphere is critically important. Meanwhile, the *Library Sector Strategy 2023–2027* includes a commitment to developing digital competence centres through creating a regional network of digitisation competence and ensuring the transfer of competencies to and between regions (Ministry of Culture, 2022). The NLL, as the Centre of Excellence for Digital Cultural Heritage, provides guidelines, training, consultations, and workshops for regional libraries on digitisation and the creation and preservation of digital content within the systems of the Digital Cultural Heritage platform. Joint training and standards foster a unified understanding of digitisation processes and metadata creation, ensuring quality preservation and the accessibility of

all digitised and digitally created materials. These efforts also enhance the knowledge and expertise of regional librarians in the field of digitisation (Ausēja, 2023). The strengthening of shared competencies in the regions is an investment for the improvement and further transfer of knowledge and experience, as well as for the enrichment of high-quality digital content. Knowledge transfer to regions is occurring gradually, as regional colleagues increasingly trust and learn from each other, sharing experiences that are often relevant due to similarities in the challenges faced by regional libraries. In the summer of 2024, two strong regional digitisation centres emerged: the Gulbene Regional Library and the Kuldīga Main Library. Both centres are willing to share their expertise, experience and knowledge with their colleagues and also with cultural workers in other regions, forming a digital competence network.

The Collections of Regional Partners

After the training, each of the partners can build and develop their own collections, which can be of two types: institutional collections and thematic collections, respectively editor-created and partner-created. Thematic collections that are created by an editor include digital content from several partners on a specific topic; for example, the collection Nonconformist Graphics of the Latvian Soviet Period[8] includes more than 3,200 digital objects – drawings, prints, posters, postcards and other documents from six different types of partners. The collection includes nonconformist graphic artworks created during the years of Soviet rule from the National Library of Latvia, Museum of the Occupation of Latvia, the Latvian National Museum of Art, Cēsis History and Art Museum and the Latvian National Archives, as well as the collections of other partners.

Regional libraries and other partners are developing institutional collections by gradually increasing the number of digital objects through manually entering or adding files to metadata exported from the library system. The collection only contains the content of the specific partner, which is added and developed at the initiative of the partner.

In total, regional libraries have added just over 2,000 digital objects to Latvia's digital cultural heritage environment over a two-year period, available in 14 regional collections, four of which are publicly accessible in the Digital Library. The main criterion for publishing a regional

8. https://digitalabiblioteka.lv/?col=27450

collection in the Digital Library is a minimum number of 100 digital objects.

In order to assess the success of the digitisation of local history in regional libraries in Latvia, it is useful to analyse the dynamics of collection development, the total number of digital objects in the collection and the statistics of total views in the Digital Library. These data offer valuable insights into public interest in the digitised content of specific regions, helping assess the effectiveness of efforts to make Latvia's cultural heritage widely accessible to the public.

In the 10 months since the launch of the Digital Library, the collections of four regional libraries were published (Figure 4). Digitisation as a trend and a priority has also reached those regional libraries that have not been interested in its implementation to date. An increasing demand for training services and consultancy has also been evident. The development of the DCH platform and the Digital Library has sped up and prioritised the digitisation processes of many libraries in regional Latvia.

Figure 4 – The digital collections of regional libraries published in the Digital Library (as of December 2024)[9].
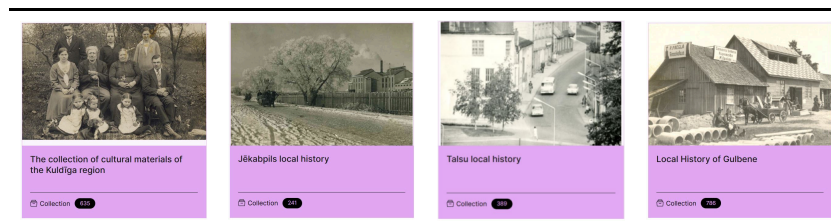
Table 1 provides a more detailed overview of the digitisation and dissemination of the local historic collections of the four regional libraries available in the Digital Library. The table shows that two collections were published in 2023 – the Gulbene Local History Collection and the Collection of Cultural Materials of the Kuldīga Region[10] – and two in 2024: the Talsu Local History Collection and the

9. https://digitalabiblioteka.lv/?subtype%5B%5D=Digit%C4%81l%C4%81s+bibliot%C4%93kas+kolekcija&q=novadu
10. https://digitalabiblioteka.lv/?col=1282761

Jēkabpils Local History Collection.[11] The table includes data on the name of each collection, reflecting the set of digitised materials from the library of the specific region; the date of publication of the collection (the date when the collection became publicly available in the Digital Library); the number of digital objects – the total number of digitised objects (photographs, documents, objects, etc.) – in each collection; and the number of views, that is, the total number of times digital objects in the collection have been viewed in a given period (01.01.2024–01.09.2024). In order to compare the usability of different collections more objectively, a coefficient has been calculated between the total number of views and the total number of digital objects; this ratio allows the popularity of different collections to be compared, regardless of their size.

Table 1: Number of views and coefficient of regional library collections in the period 01.01.2024–01.09.2024.

Name of the collection	Date of publication	Number of digital objects	Number of views	Coefficient
Gulbene Local History Collection	23.05.2023	658	72,240	110
Talsu Local History Collection	01.04.2024	339	54,666	161
Collection of Cultural Materials of the Kuldīga Region	07.11.2023	575	137,802	240
Jēkabpils Local History Collection	28.06.2024	150	9,968	66

The number of views of a collection is influenced by a number of factors, including the duration since the collection was published, the number and subject matter of the digital objects included and publicity initiatives both within the Digital Library and by the partners themselves. The duration of time since a collection's publication has an impact on the views of the collection – the longer a collection has been available to a wider audience, the more the Digital Library users have had access to this digital content. Another factor is the total number of digital objects in

11. https://digitalabiblioteka.lv/?col=1056164

the collection and its thematic scope. Each regional library develops the content of a collection differently, focusing on historical or contemporary events. For example, the number of views of the Gulbene Local History Collection is higher than that of the Jēkabpils Local History Collection, indicating that both factors – duration and volume – have a positive effect. The Gulbene collection is already known to users, has received more publicity and comprises a significantly higher number of objects, although both collections have a similar scope of content. An important factor in increasing the number of views of a collection is the interest and capacity of the regional libraries themselves to publicise their collections on social networks and on their library websites, as well as to highlight them on the front page of the Digital Library.

The coefficient indicator measures the interest of users in a given collection, which allows for comparisons between collections of different sizes and the interest of users. Noteworthily, the greater the number of digital objects in a collection, the more likely it is that more Digital Library users will find objects in that collection using the search function. By comparing the number of digital objects in a collection with the number of views (Figure 5), it is possible to evaluate proportionally how the size, content, publicity and other factors affect the total number of views of a collection. By judging the current situation, it is possible to assess which collections need more visibility and additional highlighting in the Digital Library in order to bring more users to these collections.

By analysing the data in Table 1, it is possible to determine the impact of the duration of publications and the number of digital objects on the popularity of the collections. The Collection of Cultural Materials from the Kuldīga Region is the most popular collection with the highest coefficient. This means that this collection has attracted the most interest from users, followed by the Talsu Local History Collection and the Gulbene Local History Collection.
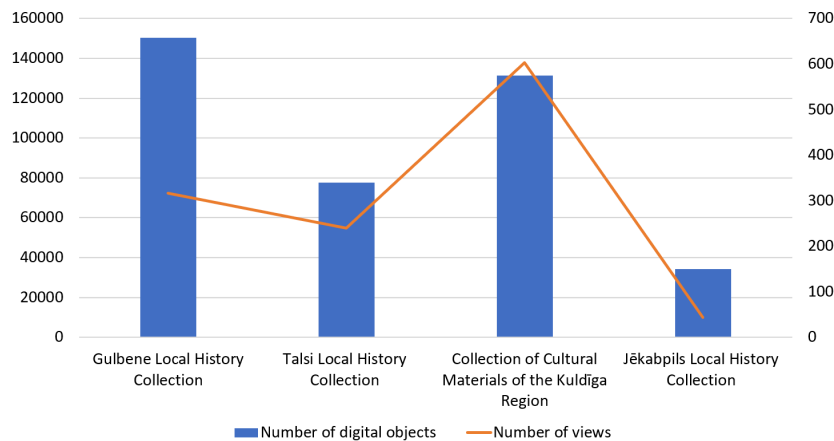
Figure 5 – Comparison of the number of digital objects in regional collections and the number of views.

Regarding the effect of the duration of publications, there is no clear correlation between the duration of a publication and the number of views. For example, the most popular collection is not the oldest one. This may suggest that other factors, such as the content of the collection and the publicity given to it, are more important. However, collections with more digital objects (The Collection of Cultural Materials from the Kuldīga Region and Gulbene Local History Collection) are usually also more popular. Nevertheless, the coefficient shows that this is not the only determining factor.

The coefficient allows for a simplified evaluation of public interest in the cultural heritage digitised by regional libraries. There is a direct correlation between the number of views and publicity activities. Collections that have been more intensively publicised both within the Digital Library and at a regional level attract more users. In addition, other factors such as the quality of metadata, which increases the discoverability of digital objects, also influences the views of collections. Further research is needed to gain a more detailed understanding of the factors influencing the popularity of collections, through analysing more data and considering other aspects such as user demographics and search queries.

Future Directions for Development

Future developments of the DCH platform and the Digital Library will focus on both technological solutions and attracting new institutional partners from the cultural, educational, and public sectors, with the aim of enhancing user experience and broadening access to cultural heritage. To achieve this, plans include the development of modern content browsing tools, improving the discoverability of digital objects, and expanding collaboration with museums, universities, and research institutions (Bandere & Ķikāne, 2024).

As the network of partners grows, it will be essential to continue developing and enhancing training programmes that provide knowledge and expertise in digitisation. These efforts will support the development and transfer of this knowledge to regional digital competence centres, thereby facilitating knowledge exchange and capacity-building across the regions.

Conclusion

The Digital Library has become an important solution for the preservation, accessibility and promotion of Latvia's cultural heritage. It provides wide access to digital resources, promoting research, education and cultural understanding. As a result of cooperation with its partners, the Digital Library brings together the collections of various institutions and individuals, ensuring a synergy of content and making Latvia's cultural heritage accessible to a wide audience in Latvia and beyond.

While each library's collection is unique, the DCH platform provides a common infrastructure and standards that enable the efficient management and long-term preservation of digital content. Due to the accessibility of the platform and the services developed to engage partners, more and more regional libraries are becoming actively involved in digitising their cultural heritage and creating a shared digital heritage. The development of the DCH platform has had a significant impact on the digitisation processes of Latvia's regional libraries, encouraging more active involvement and participation. The collaboration with regional libraries has not only added to the content of the Digital Library, but has also fostered synergies between the collections of different partners, enabling users to get to know more about Latvia's cultural diversity.

As a Centre of Excellence for Digital Cultural Heritage, the NLL provides essential support to regional libraries, helping them overcome the challenges of the digitisation process, as well as contributing significantly to the transfer of knowledge and skills to the regions through building and developing a regional digital-competence network. With targeted training, personalised services and support, regional partners have acquired the knowledge required to independently manage their digital collections and use the DCH platforms. This process has contributed to awareness raising and digital skills development in the regions and has enabled the country's digital transformation objectives to be implemented effectively.

Overall, the approach taken to engage regional partners has been successful. The initial efforts have created sustained interest and motivation for libraries to start and/or continue digitisation processes. This shows that with the necessary support and infrastructure, it is possible to effectively mobilise regional resources and build a shared national digital heritage. However, to achieve even more ambitious goals, such as implementing AI solutions, speech-to-text conversion, data and text mining for researchers, create platform for users to contribute their own digital objects to enrich Latvia's digital cultural heritage, it is necessary to further develop the DCH platform and adapt support activities to the changing needs.

References

About the Digital Library. (2023). The Digital Library. https://digitalabiblioteka.lv/par

Alfrēds Gāters. (n.d.). Literatura.lv. https://www.literatura.lv/personas/alfreds-gaters

Ausēja, E. (2023). Pārskats par digitalizāciju reģionu galvenajās bibliotēkās [Overview of digitisation in regional main libraries]. *Biblioteka.lv*. https://www.biblioteka.lv/parskats-par-digitalizaciju-regionu-galvenajas-bibliotekas/

Bandere, K., & Ķikāne, J. (2024). Digitālās bibliotēkas un vienotas kultūras mantojuma platformas izveide Latvijā. In A. Baklāne & E. Eglāja-Kristsone (Eds.), *Zinātniskie raksti 12 (XXXII). Tuvlasījums – tāllasījums* (pp. 312-339). Latvijas Nacionālā bibliotēka. https://doi.org/10.52197/DOUA6042

Kalējs, O. (1987, January 17). Alfrēda Gātera mantojums saglabāts. *Laiks*. https://periodika.lndb.lv/ periodika2-viewer/#panel:pp|issue:179374|article:DIVL165|page:3|bl ock:P3_TB00006

Ministry of Culture. (2022). *Bibliotēku nozares stratēģija 2023–2027*. Kultūras ministrija. https://www.km.gov.lv/lv/media/32748/ download?attachment

Ministry of Environmental Protection and Regional Development (MoEPRD). (2020). *Digitālās transformācijas pamatnostādnes 2021.–2027. gadam (informatīvā daļa)* [Digital Transformation Guidelines 2021–2027]. VARAM. https://www.varam.gov.lv/sites/ varam/files/content/files/digitalas-transformacijas-pamatnostadnes-_2021-27.pdf

National Library of Latvia. (2022). *Kā uzsākt kultūras mantojuma digitalizāciju? : rekomendācijas*. LNB Digitālā bibliotēka. http://dom.lndb.lv/data/obj/1058033

Stroda, I. (1999, August 28). Tēvu laipa šaizemē: Stāmerienas pagasta iedzīvotājs Alfreds Gaters [Latvian radio broadcast]. *The Digital Library*. https://digitalabiblioteka.lv/?id=oai:the.european.library.DOM:985455

Abstract

The Digital Library of Latvia is a national digital resource where Latvian cultural institutions – libraries, archives, museums, organisations – and private collectors collaborate, preserve and present Latvia's digital cultural heritage in one place. The Digital Library provides access to more than 3.8 million digital items of various kinds – texts, images, museum objects, archival items, video and audio recordings, 3D objects – offering a synergy of content from more than 650 partners. It has become an important tool for the preservation and promotion of Latvia's cultural heritage, bringing together the digital collections of various institutions and individuals, providing broad access to Latvia's cultural assets and promoting research, education and cultural understanding. This article discusses the Digital Library's cooperation with various partners, focusing mainly on regional libraries as custodians of important cultural heritage. The involvement of regional libraries has diversified the content of the Digital Library, fostering synergies between different partners and revealing the diversity of Latvian culture. The National Library of Latvia, as a Centre of Excellence for Digital Cultural Heritage,

provides essential support to regional libraries, enhancing their capacity to build and manage their digital collections. The Digital Library, as part of the Latvian Digital Cultural Heritage (DCH) platform, is not only a technological solution, but also a tool for the long-term preservation of Latvia's cultural heritage. It provides a common infrastructure, standardised processes and a support system that enables the efficient management and preservation of digital content. The creation and development of a single DCH platform has generated sustained interest in digitisation and fostered cooperation among libraries, museums and other institutions in regional Latvia. However, to achieve even more ambitious goals, it is necessary to further develop the platform and adapt support activities for changing needs.

Keywords

Digitisation; Cooperation; Digital Library of Latvia; Digital cultural heritage platform; National Library of Latvia; Latvia

Bertrana de Capçalera: The Promotion of a Special Collection Based on Digitisation Projects

Laura Moré

The University of Girona (UdG) is one of the 12 universities of Catalonia, an autonomous region in the north of Spain. Its mission is to contribute to creating and spreading knowledge; promote social equality, as well as the economic and social development of the region in its geographical proximity; and endorse the Catalan language and culture.

As part of its mission to contribute to the dissemination of the Catalan language and culture from its foundation in the early 1990s, the library of the UdG holds and preserves a special collections section. This section contains the personal libraries and archives of several relevant personalities from different fields related to Catalan culture, such as historians, writers, and philosophers.

The Prudenci and Aurora Bertrana Collection is one of these collections and also one of the first ones to become a part of the UdG library. The collection is a good example of cultural heritage saved at the last moment because, after Aurora died in 1974, her apartment was emptied to be sold. Fortunately, Professor Modest Prats, an eminent Catalan philologist and professor from UdG, was informed, and he reacted quickly. The books and manuscripts remained in a rubbish plastic bag, temporarily stored in a closet until the university and the library were officially created. Professor Prats then transferred the responsibility of the collection management to the library.

Since then, the collection has been inventoried, catalogued, and almost completely digitised, and it is currently accessible at the Barri Vell Campus Library, in the Legacy and Reserve Room. After all these years and strong promotional work, it has been augmented with other donations. The collection is currently composed of 1,200 books, mainly literature in Catalan, Spanish, French, and English; literary manuscripts, some of them still unpublished; newspaper clippings; and personal documents, including letters, photographs, and original drawings.

The collection is named after both father and daughter, but it was sourced from Aurora's library and archive. By the time we received the collection, Prudenci was more renowned than his daughter, which is

why we named the collection after both of them. Nowadays, Aurora has become as renowned as her father, and researchers are even more interested in her than in him.

About Prudenci and Aurora Bertrana

Prudenci Bertrana (1867–1941) was a modernist writer, journalist, theatre critic, and painter born in Tordera (Figure 1). He moved to Girona to study and remained there. In Girona, Prudenci got married to Neus Salazar and had four children with her, all of whom died except for Aurora (1892–1974). He worked as a painter and wrote art and theatre critiques in several journals until he published his first novel, *Josafat*, in 1906. The novel was a success but also highly controversial, as the plot involved a love affair between a prostitute and a bell ringer. At that time, Girona was an extremely conservative city, ruled by the church and the military sector, which did not like the book much.
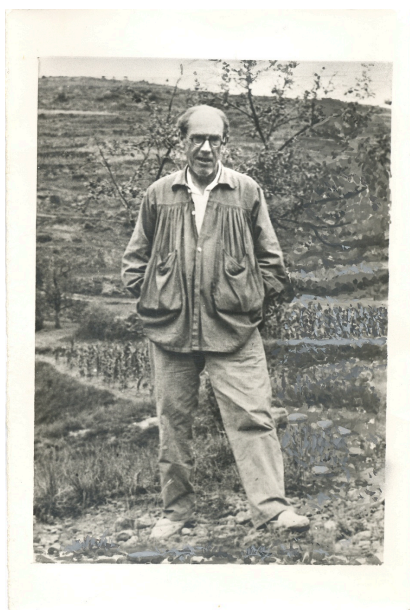
Figure 1 – Prudenci Bertrana (Universitat de Girona. Fons Bertrana).

In 1912, Prudenci was expelled from Girona because of a polemical article about a soldier. He moved with his family to Barcelona, where he remained until his death. In Barcelona, Prudenci worked as an art teacher

and wrote articles for several journals, such as *La Veu de Catalunya*. His most remarkable works are *Nàufrags* (1907), *L'Hereu* (1931), *El vagabund* (1933), and *L'Impenitent* (1948).

Prudenci was an artist with a close affinity to the land and nature and with an anti-intellectual attitude. His literary depictions were significantly influenced by his artistic perspective. He lived his entire life with the feeling that his work was not valued.

Aurora Bertrana had always wanted to become an author, but her father convinced her to study music instead (Figure 2). She studied the cello in Girona, Barcelona, and then Geneva. During her stay in Switzerland, to earn a living, she founded a feminine jazz ensemble that played in the hotels of Chamonix. However, in 1924, she stopped her career as a musician to finally study literature in Geneva. In a radio performance, she met Denis Choffat, a Swiss engineer, to whom she got married in 1925.

Figure 2 – Aurora Bertrana (Universitat de Girona. Fons Bertrana).

The couple spent four years, from 1926 to 1930, in French Polynesia because of Denis Choffat's work. Aurora began to write chronicles from her life in Polynesia and about the natives, especially about women and their social situation. The articles were originally published in the

magazine *D'Ací i d'Allà* and were finally compiled and published as a book under the title *Paradisos oceànics* (1930), which became very successful.

After returning to Barcelona in 1933, she was a candidate for the Catalan congress election as part of the Catalan Republican Party in the first election where women were allowed to vote, but she was not elected. Aurora was involved in the organisation of cultural activities for women, and she also conducted many conferences about feminism, travel, and the Catalan language.

In 1935, she travelled by herself to Morocco to study Muslim women's social situation, after which she published the book *El Marroc sensual i fanàtic* (1936). During the Spanish Civil War, in 1938, Aurora went into exile to Switzerland, where she notably survived by working as a translator and writer. Those years were challenging for Aurora: she had separated from Denis Choffat and was in Geneva on her own, and she even needed charity at times.

During World War II, she was engaged in several humanitarian missions; these experiences are reflected in her books *Camins de somni*, *Tres presoners*, and *Entre dos silencis*.

She finally managed to come back to Barcelona from exile in 1950, where she kept writing and also worked as a proofreader and French teacher. She wrote her father's biography under the title *Una vida*, along with her memoirs. A weak and frail Aurora finally died in 1974 in Berga.

Opportunity

In 2017, the Catalan government officially declared the Bertrana Year to commemorate the 150th and 125th anniversaries of the birth of Prudenci Bertrana and his daughter Aurora, respectively. During the year, several exhibitions and activities were planned to disseminate both authors' lives and works.

Given that Aurora and Prudenci were from Girona and that their collection was one of the first ones that came to the UdG library, all the staff were enthusiastic and motivated to participate in celebrating the Bertrana Year.

Since we processed the collection, we have worked hard to popularise it. Over the years, we have conducted exhibitions, lent some materials for external exhibitions and documentaries, written articles, organised

public visits to the collection, and published promotional merchandise such as bookmarks. Therefore, we deemed it necessary to go further and actively participate in the commemoration, creating something from our knowledge of the collection and its makers, as well as our professional expertise.

We detected a gap in the study of Prudenci's and Aurora's works. Researchers have paid little attention to their journalistic production, which, especially in the case of Prudenci, was extensive. This gap was the seed of the project: we decided to create a database to compile both authors' journalistic works. The main goals of the project were to create a useful tool for researchers and keep promoting both authors, their production, and their special collection.

Methodology

To meet our goal, we developed a working methodology. As a starting point, we searched for the authors in the bibliographies included in the publications and academic works to identify all their journalistic productions (Bertrana, 1911, 1936, 1965; Bertrana et al., 2007; Guansé, 1994, pp. 43–46; Lanao, 1989; Portell, 1999; Real, 2007, 2014, 2016; Tasis, 1966).

In the second phase, we studied the clippings and manuscript versions of the articles from the special collection. To our advantage, Prudenci and Aurora meticulously archived all the drafts and publications, which allowed us to study the creative process of the articles from the manuscript, the galley proof with handwritten corrections, and the published versions.

Studying these materials allowed us to detect some journals and newspapers where the authors regularly published articles. This was especially relevant in the case of Prudenci, who had regular columns comprising his opinion articles and literary and theatre reviews in several publications.

Once we identified the main journals and newspapers in which the authors regularly published, the staff involved in the project searched for full-text articles in the Catalan and Spanish portals that have digitised and made accessible numerous old serials under some national digitisation

projects. For instance, one of the main sources was ARCA,[1] a collaborative project coordinated by the Catalan National Library that gives access to the most relevant old Catalan magazines and newspapers.

All the findings were shared among the participating staff in weekly meetings to assess the evolution and make any necessary changes. *Bertrana de Capçalera* successfully involved all kinds of library staff, including librarians and administrative and IT members, as an example of a transverse and horizontal working organisation.

Technical Infrastructure

Bertrana de Capçalera had to be a zero-cost project, as no budget was allocated. Therefore, we had to design a simple tool with the available resources. Given the lack of budget, the initial idea was to add a simple tab with the references and links to the full-text in the collection webpage on the special collections portal.[2] However, we realised that Prudenci Bertrana's production was so large that the resulting webpage would not be user-friendly at all. Therefore, we decided to build a database with the UdG Library's IT team. A dedicated database would be considerably more useful for retrieving the information according to several criteria and also for entering the references.

In the design stage, we considered the database requirements for the background and determined that it should be a web environment suitable for multiple simultaneous users, as well as easy to work with. The result was a record template with the most significant fields to identify the articles: author, journal/newspaper, title, URL, date text (date in the format that appears in the publication), formatted date (dd.mm.yyyy for sorting purposes), year (for sorting), number/pages, and series (if applicable), besides other internal fields for the database management. This work environment had a single table format that allowed rapid (simple) and advanced searches and enabled the sorting of the records by their creator, that is Prudenci or Aurora (Figure 3).

---

1. Arxiu de Revistes Catalanes Antigues https://arca.bnc.cat/arcabib_pro/ca/inicio/inicio.do
2. https://fonsespecials.udg.edu

Figure 3 – Database work environment (Universitat de Girona. Biblioteca).

Figure 4 – *Bertrana de Capçalera* user interface (Universitat de Girona. Biblioteca).

On the other hand, the user interface[3] was split into two different tables, one each for Aurora and Prudenci. The displayed fields were title (including the article title and the date in the format appearing in the publication); publication year (for sorting); date (formatted and for sorting); publication (the journal or newspaper); numbering and pages; and series (only for those articles belonging to the same column, such

3. https://fonsespecials.udg.edu/bertrana-de-capcalera

as *Ideari bàrbar* in Prudenci's case or *Impressions d'una dona a través de l'Àfrica musulmana* in Aurora's case). The user interface allowed searching and filtering by any term, as well as alphabetical or chronological sorting by any field (Figure 4).

The article title included a link to the full-text when available. Whenever it was possible, we used permalinks, but not all the sources provided them. Shortly after the database release, the Catalan National Library, one of the main sources, changed the structure of the ARCA project server, and we had to manually change all the links in our database. We were willing to take this risk as the value of full-text access was worth it. In the future, it will also be necessary to keep checking for newly available full-text articles and adding them to the database.

As this information system must be accessible to the other information systems in a flexible and standardised way, we chose the following tools: the framework was based in RapidApp (Perl + Ajax + ExtJs 3.0) with a model–view–controller, and it was extensible.

The working environment, as mentioned before, was the web browser, which made its use easy and convenient for all users, as everyone was familiar with it. As for the professional roles, three different levels were defined, namely admin, editor (record entry), and user (view only).

The functionality of this work environment was the local information export, as data must be exported and published in the special collections portal, with the possibility to display reports in several formats, such as .txt, .csv, .xls, and .json. At the same time, data from other information systems could be remotely obtained.

The database was built with SQLite, a type of relational database contained in a library, with the C programming language and intended to be integrated into other programmes. To display information in the special collections portal, we used a REST API, a web-based software architecture for distributed systems that allows remote retrieval and processing of data to generate a searchable, filterable, and sortable table. The technological tools used were JavaScript, jQuery, and jQuery Tables.

Design

Given that *Bertrana de Capçalera* had to be embedded in the special collections portal located on the UdG Library website, which depends on the UdG general website, some technical limitations occurred. In 2017,

UdG's CMS was DotNetNuke, and we also had to adapt to UdG's image and branding. Therefore, we decided to choose a table format for the user interface. Although this format was not the most attractive interface design, it fulfilled its function.

The only way to improve the user interface appearance and make it more appealing was by designing a header. The header was inspired by the newspaper covers from the beginning of the 20th century, with the title of the project written in a typical typography of that time.

The header fulfilled two functions. First, it was a branding strategy that allowed the rapid identification of the webpage. Second, as mentioned before, it served as a more attractive design.

Project Release and Future

By 2018, once the Bertrana Year was over, the database had reached almost 1,450 articles by Prudenci and 150 by Aurora. Immediately after the database publication in the special collections portal, several publications and academic works were written using its information (Pujol Prat, 2023; Rufi, 2017; Solsona, 2024; Vila, 2018). Therefore, it proved to be a crucial reference for researchers working on these authors.

Furthermore, *Bertrana de Capçalera* was a complete success as a collaborative and horizontal work model in our library, gathering staff from different sections and professional profiles. Therefore, we decided to replicate this working model in future projects.

In 2017, the challenge for the future was to keep growing and trying to find and identify 100% of the articles by both authors. We have not reached this goal seven years later, as of 2025, but the database already contains 2,202 articles by Prudenci and 174 by Aurora. Most of them have been provided by researchers who used the tool. One of the researchers even offered to volunteer at the library to add their findings to the database.

For the coming years, we will keep working to include all the journalistic work by Prudenci and Aurora Bertrana in the database and to add new available links to full-text articles. During 2023, the clippings from the collection were digitised and are now available as well.

Regarding the metrics, in 2023, *Bertrana de Capçalera* received 870 visits, which is a significant number for a local and specialised collection.

Therefore, this humble success encourages us to keep creating new projects related to our special collections.

References

Bertrana, A., Fundació Valvi, & Fons Jordi Castellanos. (2007). Bertrana, Aurora, 1892-1974. *Aurora Bertrana, periodista dels anys vint i trenta: selecció de textos*. CCG Edicions.

Bertrana, P. (1911). *Proses bàrbares* (2nd ed.). Societat Catalana d'Edicions.

Bertrana, P. (1936). Impromptus I. Llibr. Catalònia.

Bertrana, P. (1965). *Obres completes*. Selecta.

Guansé, D. (1994). *De Maragall a l'exili assaigs de crítica literària*. El Mèdol.

Lanao i Reverter, P. (1989). Bertrana, escriptor de vocació, periodista per obligació. In *Prudenci Bertrana i la seva època* (pp. 55–59). Generalitat de Catalunya. Departament de Cultura. Serveis Territorials.

Portell, C. (1999*). Ideari barbre (El Poble català, 1914), Ideario bàrbar (La Publicidad, 1920-1922) de Prudenci Bertrana: Introducció a l'estudi i edició crítica*. [Doctoral dissertation, University of Girona].

Pujol Prat, J. (2023). *Prudenci Bertrana, el caçador d'enyorances. Estudi periodístic (1896-1938)*. [Doctoral dissertation, University of Girona]. Tesis Doctorals en Xarxa (TDX). http://hdl.handle.net/10803/690258

Real Mercadal, N. (2007). *Aurora Bertrana, periodista dels anys vint i trenta*. CCG Edicions.

Real, N. (2014). Periodisme i literatura: Aurora Bertrana. *Caplletra*, *45*, 9–31. https://raco.cat/index.php/Caplletra/article/view/276798

Real, N. (2016). Dossier – Aurora Bertrana, periodista moderna. *Revista de Girona* (299).

Rufí Pagès, J. (2017). Bertrana de capçalera: la gran sèrie barcelonina de Prudenci Bertrana. *Àmbit de Recerques del Berguedà Política de permisos*. http://hdl.handle.net/10256/16729

Solsona, R. (2024). *Bertrana, artista impenitent (Vol. 1)*. Fundació Prudenci Bertrana.

Tasis, R. (1966). L'obra de Prudenci Bertrana: un monument impressionant. *Serra d'or*, *8*(4), 89–90.

Vila Gelada, À. (2018). *Prudenci Bertrana, periodista: els articles de L'Esquetlla de la Torratxa (1912–1914)*. [Bachelor's thesis, University of Girona]. DUGiDocs. http://hdl.handle.net/10256/15932

Further Readings

Ezquerra, X., Moré, L., & Rufí, J. (2018). Bertrana de Capçalera. Un projecte de la Biblioteca de la UdG per a l'Any Bertrana. *15es Jornades Catalanes d'Informació i Documentació.* https://www.cobdc.net/15JCID/wp-content/uploads/2018/05/Exp22.pdf

Ezquerra Elias, X., Moré, L., & Rufí Pagès, J. (2019). *Bertrana de Capçalera, un proyecto de humanidades digitales*. Universitat de Girona. Biblioteca. http://hdl.handle.net/10256/16728

Pla, X. (2017). *La novel·la de la vida de Prudenci Bertrana: La seva posició en la literatura catalana contemporània*. Diputació de Girona. http://hdl.handle.net/10256/14491

Fons Bertrana (Universitat de Girona).

Universitat de Girona. (2024a). *Fons Especials: Prudenci i Aurora Bertrana*. https://fonsespecials.udg.edu/

Universitat de Girona. (2024b). *Manuscrits del Fons Bertrana*. https://dugifonsespecials.udg.edu/handle/10256.2/4290

Abstract

The University of Girona (UdG) Library has undertaken an innovative initiative to promote and preserve the Prudenci and Aurora Bertrana Collection, a major piece of Catalan cultural heritage. This collection comprises over 1,200 books, manuscripts, letters, photographs, and personal documents and highlights the contributions of Prudenci Bertrana, a modernist writer and critic, and his daughter Aurora Bertrana, an author, feminist, and chronicler. To commemorate the Bertrana Year in 2017, the library launched *Bertrana de Capçalera*, a zero-budget project that involved digitising and cataloguing the authors' extensive journalistic production. Using a bespoke database and collaborative methodologies, the initiative has created a research tool with over 2,300 articles available for academic use. Despite challenges such as

limited funding and evolving digital infrastructure, the project has significantly advanced the accessibility and study of the Bertranas' work, demonstrating the library's commitment to preserving cultural heritage and fostering scholarly collaboration.

Keywords

Exploring Opportunities for Popularising Digitised Collections Within Finna Services

Saga Jacksen

This study introduces Finna Services and discusses how it has approached the popularisation of digitised collections for different user groups. By popularisation, we mean making the extensive collections of museums, archives, and libraries more appealing and accessible, not only to museum and archive researchers but also to broader audiences.

In Finland, significant progress has been made in digitising collections throughout the 2010s and 2020s. For example, by 2018, professional museums had digitised and made a total of 1,633,920 records accessible online (Museovirasto, 2019). By 2023, the amount of digitised material published by museums across various platforms has grown by nearly half, the total being 3,310,924 digitised objects. Altogether, professional museums in Finland hold a total of 47 million collection objects, and digitisation efforts are ongoing (Museovirasto, 2024). By additionally considering the digital materials from archives and digital books from libraries, this enormous volume creates vast opportunities for discovering materials. It also raises the question as to how a service like Finna should best utilise such a large volume of content so that users can grasp and appreciate the significance and many possible uses of these materials.

What is Finna Services?

Finna is a search service maintained by the National Library of Finland. Finna Services offers organisations the opportunity to have their own search site based on Finna. Additionally, Finna Services maintains the Finna.fi website, which brings together materials from hundreds of different Finnish libraries, museums, and archives. While functioning as a traditional library platform, Finna showcases thousands of digitised and CC-licensed pictures, objects, and various archive materials. In total, Finna has over 18 million records, of which three million are available online. The amount of records increases every week. Finna's user interface is available in four different languages: Finnish, Swedish,

English, and Northern Sámi. During 2023, Finna.fi had over 4,740,000 user visits.[1]

Finna Services has over 450 customer organisations. As part of Finna Services, we offer personalised search-views for the organisation's customers. Additionally, we develop the search service in cooperation with organisations and provide technical support for them. In this article, however, the focus is on the Finna.fi website.

Considering the diversity of the customer organisations and their collections, Finna Services has extensive user cohorts to consider. This diversity offers countless opportunities to highlight and curate materials with different user groups in mind. In addition to the traditional search, Finna has two different content pages created for different targeted groups: *A Shortcut to Research-Based Knowledge* and *Finna Classroom.*

Content Page: A Shortcut to Research-Based Knowledge

A Shortcut to Research-Based Knowledge is a content page that highlights materials from universities and publication archives.[2] The page allows the presentation of recent research publications and theses from various science fields. The page aims to highlight the fact that Finna offers access to a wide range of scientific publications and even research data. Numerous research publications and theses have been harvested into Finna. For example, scientific publications from the Journal.fi service comprise a significant portion of scientific publications in Finna, with a total of 84,231 records as of the beginning of 2024. In addition, Finna also includes harvested publication archives from various universities.

We have created predefined searches for the page based on current themes, allowing users to easily access research-based knowledge through topics of interest. Pre-made searches have been highlighted using visually appealing cards in the user interface. Publications have been featured in a carousel style, and we have also made browsing the latest theses easier visually. Organisations participating in Finna can propose research publications for the carousel on the page up to five times a year. The shortcut follows certain criteria for suggested and highlighted materials. These materials:

---

1. According to Finna's statistics for 2024 via Matomo Web Analytics.
2. https://finna.fi/Content/tutkittu-tieto?lng=en-gb

1. Must be scientific publications that are openly available online
2. Must be published within the past year or particularly relevant to current topics
3. Must be interesting and engaging for the general public
4. Must have titles that are accessible to a broad audience, avoiding complex professional terminology or abbreviations
5. Must have a cover image in Finna

A Shortcut to Research-Based Knowledge is developed such that the user lands on Finna's search to browse materials, which might otherwise be difficult to filter in the search results. Furthermore, the shortcut also allows direct access to individual records.

With this content page, we aim to reach *ordinary citizens* who may not otherwise discover or actively search for scientific publications as researchers do. The page is closely tied to the popularisation of science. By simplifying the search for scientific publications, more people may become interested in current developments in the field of science. At the same time, scientific publications gain new visibility in our search service.

Content Page: Finna Classroom

Finna Classroom is a content page in Finna designed especially for teachers and educators, which highlights various teaching materials in three different ways. The *Classroom* showcases open educational resources (OER) from the Open Educational Resources Library (Figure 1). These open educational resources are free to use and available to everyone. Each resource is accompanied by official educational information that complies with the national curriculum.[3]

In addition to the OERs, *Finna Classroom* also features curated materials created by organisations. These curated materials can be compiled into cohesive sets, including photographs, books, recordings, archival materials, and more, based on records available in Finna. The curated materials typically include a short description of the topic and ready-made activity ideas for teachers. Curated teaching materials always include educational details that align with the national curriculum.

---

3. https://aoe.fi/#/lisatietoa

The educational resources come to Finna from the Library of Open Educational Resources (aoe.fi).

The online learning material combines diverse scientific and practical perspectives of sustainability with social work. It offers research-based critical perspectives on how social work can make use of knowledge, concepts and practices of sustainability research and to promote the social inclusion of vulnerable groups such as youth in precarious situations and individuals with a migration background. Freely accessible to all! Specifically aimed at students, teachers, and researchers in social work, and actors in diverse fields searching for pathways to sustainability transition.

Material usage rights

CC BY-NC-ND 4.0   What does this mean?

Educational Role

Student

Educational Level

Higher education
Bachelor's degree
Master's degree

Learning Resource Type

Lecture

Educational Subject

Business and management
Economics
Educational sciences
Law
Media and communications
MORE▼

Figure 1 – A screenshot of the OER record on Finna.fi. The record displays teaching information.

In addition to OERs and curated materials, *Finna Classroom* has its own section for literacy skills. The Literacy section offers ready-made reading packages and literature recommendations for different age groups. The book lists have been created in collaboration with Finnish libraries. The section is currently available only in the Finnish-language interface.

Similar to the *A Shortcut to Research-Based Knowledge* content page, in *Finna Classroom*, users are ultimately directed to records or pre-filtered search results in Finna. The *Classroom* page is slightly more hierarchical than *A Shortcut to Research-Based Knowledge*, as it includes category pages organised by school subject themes. The purpose of this organisation is to help teachers navigate more easily to the subjects they teach and find materials for their use.

The primary purpose of *Finna Classroom* is to assist teachers in finding digital learning materials for educational use. Additionally, the platform offers organisations the opportunity to share pedagogical materials and

increase their visibility among teachers. This feature allows cultural heritage organisations to connect more closely with students, particularly young children. In particular, the ready-made curriculum-aligned information and task ideas in curated materials support the further use of the materials.

Considering the End Users: User Journey

The user journey is straightforward in both *A Shortcut to Research-Based Knowledge* and *Finna Classroom*. The pages are designed so that users ultimately arrive at the Finna search or specific records within Finna (Figure 2). The primary purpose of these content pages is to spark the users' interest and provide examples or ideas for various ways to use the materials. If users go directly to the Finna search, the results can sometimes be overwhelmingly broad, making it challenging to find suitable materials. If the search experience is frustrating from the users' initial attempts, it is unlikely that the use of these materials will increase among general audiences.

Finna users have already shown promising engagement with both *A Shortcut to Research-Based Knowledge* and *Finna Classroom*. In 2023, the Finnish language version of *A Shortcut* saw a total of 7,173 unique visits. In 2024, a total of 7,673 unique page views were recorded in the statistics. *A Shortcut* has a clearly defined, stable user base, and we hope that this page will enhance ordinary citizens' opportunities to access research information.
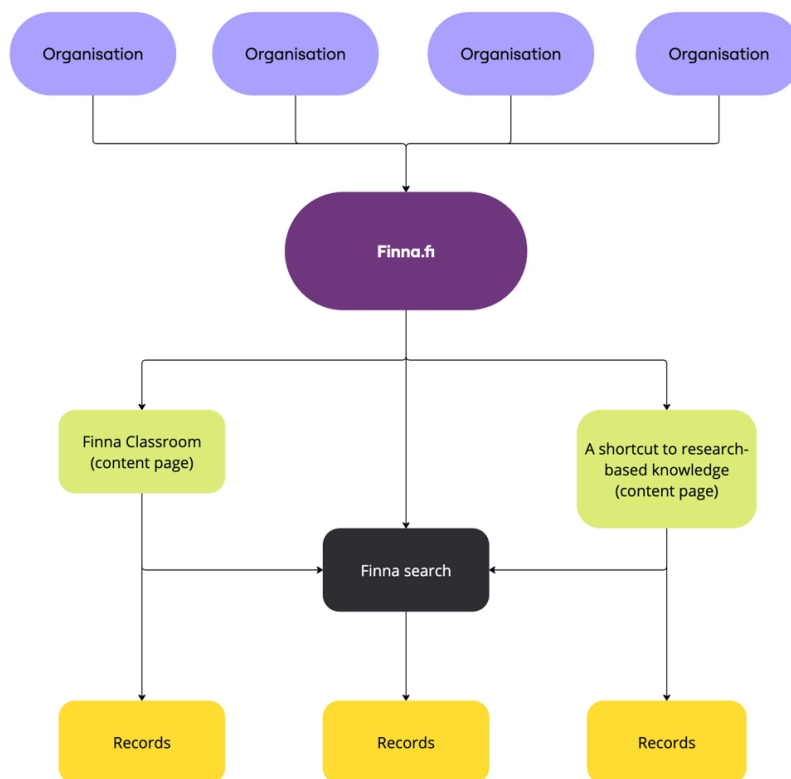
Figure 2 – Finna.fi flow chart.

The Finnish language version of *Finna Classroom* had 9,945 unique visits in 2023. In 2024, *Finna Classroom* had expanded its visitor base. According to Finna's statistics, the *Finna Classroom* homepage alone recorded 15,504 unique visits after its publication in May 2024. The re-designed *Finna Classroom* page was only launched in May 2024, making comparable data unavailable for the entire year. The usage statistics for curated materials are also promising for popularising the collections. In 2023, the two most popular curated materials each received over 2,000 views. *Finna Classroom* was re-designed in the spring term of 2024, and it was marketed to teachers at the start of the fall term. The growing visitor numbers are very encouraging.

Considering Users: Usability Testing

New features and pages in Finna are often tested before being released. Usability tests help us determine whether the planned changes or new elements are user-friendly and understandable from the perspective of end users. Both the renewed *Finna Classroom* page and the Material Package Tool (see below) were tested before their release. Usability tests were conducted during the autumn of 2023 and spring of 2024. The *A Shortcut to Research-Based Knowledge* page was tested earlier for development purposes in the summer of 2023. Usability tests were held remotely via the Zoom service because the participants were from various parts of Finland. The advantages of using a video call service in testing include the ability to share screens and record videos for later review. Videos are usually transcribed at the desired level and analysed. Thereafter, a report is created for personal use, internal use within Finna, or public use. User testing provides feedback on our published pages, allowing us to develop them in line with user preferences. Most importantly, usability testing gives us direct feedback from the specific user groups we aim to target and who engage with our materials.

Considering Organisational Clients: The Material Package Tool

At Finna, we do not develop services solely with end users in mind. An important part of our work is also to support organisational clients by making it easier for them to showcase their materials on Finna. Finna largely operates within the boundaries of a traditional search service. Organisations can add their own materials to Finna and highlight interesting searches or curated lists of favourites within their own Finna views. Customer organisations have expressed a need for easier ways to curate collections of digital materials. The most visible curated collections on Finna have been the *curated materials* collections specifically designed for educational use. The use of *Finna Classroom* has been continuously growing among end users. At the same time, the amount of material on the *Classroom* page has increased. Organisations have published numerous *curated materials* in *Finna Classroom*. In 2022, there were 57 curated materials in *Finna Classroom*, each of which had two language versions, in Finnish and Swedish. As a result, there were 114 curated materials in total. The materials were created using Finna's favourite list feature as their own content pages on Finna.fi. The content pages included specific features designed for the curated

materials, which differed from the usual end-user favourite list. Although the increasing number of curated materials was a positive development, their maintenance began to prove challenging. As a result, Finna started developing a new tool that would allow organisations to compile curated materials more flexibly, add educational details more easily, and publish and edit them independently without intermediaries.

The Material Package Tool is designed to be easily accessible from Finna's administrative interface. The tool has been made as user-friendly as possible by implementing it as a form using Drupal. The form includes separate fields for titles, free text, and educational information. Moreover, educational information is retrieved directly from the Finnish National Agency for Education's application programming interface (API), which simplifies information entry and reduces the likelihood of errors. Records from Finna can be entered into the form in two different ways: by directly entering the record's URL or by adding a favourite list created within Finna. Currently, the Material Package Tool can only be used for creating curated materials for educational use. Educational curated materials can be published in Finnish, Swedish, and, most recently, also in Northern Sámi. Lately, organisations have expressed a need to curate collection showcases for other target groups as well, so the tool is currently being further developed to meet this requirement.

Conclusion

Finna Services exemplifies how digital collection platforms can bridge the gap between cultural heritage institutions and diverse user groups. By integrating tailored content pages such as *A Shortcut to Research-Based Knowledge* and *Finna Classroom*, the platform has significantly enhanced access to academic publications and educational materials. The increasing user engagement highlights the effectiveness of this approach in popularising digitised collections.

Moreover, Finna's iterative development, guided by usability testing and user feedback, ensures continuous improvement in accessibility and functionality. The success of tools such as the Material Package Tool underscores the importance of providing institutional clients with streamlined methods for curating and presenting materials, fostering a more interactive and engaging digital archive.

Looking forward, sustaining and expanding these initiatives will be crucial in reinforcing Finna's role as a centralised platform for digital

collections. By further refining search functionalities, enhancing user experience, and expanding the scope of curated materials, Finna can continue to serve as a model for digital collection accessibility.

References

Museovirasto. (2019). *Museoiden kokoelmat 2018 -taulukko. Museotilasto 2018*. https://www.museotilasto.fi/tiedostot/museovirasto/files/Tilastokortti6.pdf

Museovirasto. (2024). *Museoiden kokoelmat 2023 -taulukko. Museotilasto 2023*. https://www.museotilasto.fi/tiedostot/museovirasto/files/tilastokortti_6_2023.pdf

Abstract

Finna Services, managed by the National Library of Finland, serves as a digital gateway to Finnish cultural heritage, integrating collections from museums, libraries, and archives. With over 18 million records, Finna aims to enhance accessibility and engagement with digitised materials. This article examines strategies implemented to popularise digital collections through curated content pages, namely *A Shortcut to Research-Based Knowledge* and *Finna Classroom*. These initiatives facilitate user-friendly access to academic research and educational materials, respectively, broadening Finna's audience beyond traditional researchers. Additionally, the introduction of the Material Package Tool enables cultural organisations to independently curate and publish educational content. By leveraging usability testing and user feedback, Finna continually refines its services to enhance discoverability and engagement. The study highlights the importance of tailored digital curation in promoting cultural heritage and supporting diverse user needs within the digital humanities landscape.

Keywords

Digital collections; Cultural heritage; Curated content; User engagement; Usability; Popularisation; Finna

Digital Heritage Collections: Can We Measure Impact?

Mimi Seyffert-Wirth

Cultural heritage institutions such as libraries, archives, museums and others have been increasingly making content available digitally over the last few decades. Digital heritage can be described as 'unique resources of human knowledge and expression' (UNESCO, 2009) in digital form. Making heritage available in this manner creates 'a new ecosystem of commemorative practices and collective remembering' (Burkey, 2022, p. 186) and leads to engagement with user communities.

Stellenbosch University Library and Information Service in South Africa is no exception. Its digital heritage repository, SUNDigital Collections,[1] was established in 2013 and hosts historical documents, images, music collections, indigenous knowledge collections and finding aids for these collections to increase the visibility of special and unique collections held by the library. The repository runs on DSpace open-source software (version 6.3) and makes use of the open-source analytics plugin Matomo for statistics.

Use of the repository is tracked and shows approximately 40,000 to 50,000 visits per annum and approximately 20,000 to 40,000 downloads per annum. These statistics exclude bots, as all bots are blocked from directly crawling the SUNDigital Collections bitstream store (i.e. full text files) and there is no evidence of SQL injection (i.e. item-level access) in the log files to make us suspect that the usage represented by these statistics is in any way misrepresented or inflated due to bot visits. These statistics, however, do not relate anything about the impact of the repository.

Research Impact

Research impact, or societal impact, can be described as the influence work has beyond academia, such as on society, economy, culture, public

---

1. https://digital.lib.sun.ac.za/

policy, technology and the environment (University of Sydney Library, 2024).

According to Shaw (2016), much evidence of the value of digitising collections remains anecdotal, but the demonstration of impact is important for informing internal decision making and justifying digitisation activities.

In terms of institutional repositories, where research outputs (e.g. theses, dissertations, articles and conference papers) are hosted, it is fairly easy to establish impact. Views, downloads and mainly citations are analysed, as it is common in academia that a high citation count is an indicator of research impact. Bibliometrics and Altimetric are also employed for the investigation. We link this impact to a potential increase in institutional rankings and our goal, which is knowledge in the service of society.

It is more difficult to define or demonstrate impact in terms of digital heritage collections. According to Terras (2015), it is problematic to fully understand the reuse of digitised content, and various research methods, quantitative, such as bibliometric and log analysis, and qualitative, such as user feedback and surveys, have been employed.

Measuring Impact

Borrego (2020) suggests that analysing citations from scholarly outputs in Google Scholar may be used to measure the impact of digital heritage collections. The methodology is simple, as 'Google Scholar indexes the *full-text* [sic] of documents, facilitating the retrieval of citations inserted in the text or in sections that are not the final list of references' (Borrego, 2020, p. 1). Inserting part of the URL of the digital repository in the search box yields results. In the case of SUNDigital Collections, the search, conducted in May 2024, yielded 52 results. These included masters and doctoral theses and dissertations, research articles, books, book chapters and an online encyclopaedia entry. Some of these research outputs show 10 or more citations, and these in turn may also be investigated to assess impact. As Borrego (2020) proposes, this method does provide evidence of the academic impact heritage collections among researchers and students.

Investigating user statistics in the Matomo analytics plugin is also a method of measuring impact since the system shows links to digital heritage collections and items in the repository from outside websites. Matomo also provides the opportunity to set goals. This could, for

example, be triggered when a user visits a certain page title or downloads a certain file, giving automated statistics to specific collections the use of which one would want to track. In the case of SUNDigital Collections, these included links from authoritative sites such as heritage and genealogical portals, websites on South African history and Wikipedia. Links are spread across many records in different collections. Patterns of use also appear in usage statistics, pointing to increased reuse of specific collections or items. These patterns may be explored and often point to specific research projects being conducted by, for example, groups of students.

Bangani et al. (2020) examined acknowledgements in electronic theses and dissertations as a way to determine the value of libraries' and librarians' contributions to postgraduate studies. Similarly, the value of specific collections could also be determined. Bangani et al. (2020), however, warn that acknowledgements as a measure of impact should be used with caution, as it is not necessarily a complete reflection of the extent of contribution.

Increasing Impact

Terras (2015) argues that open access and an open approach to the delivery of digitised cultural heritage allows for sharing reuse and fosters development in research across the sector. It seems obvious that making heritage available should be the default, but Terras (2015) suggests that there remain barriers to this, such as works still subject to copyright, orphan works and the idea of what this openness means for institutions in a monetary and reputational sense. In the case of SUNDigital Collections, all records are openly accessible, and no restricted content is considered for upload.

Increasing visibility by means of search engine optimisation is something to consider in order to potentially increase impact. In the case of SUNDigital Collections, sitemaps were created and Google metadata fields were mapped to Dublin Core metadata fields, which we use for description in the repository. A search for a collection in SUNDigital produced a link on the first page of results on various search engines. On Bing and DuckDuckGo, the link appeared second on the list of results, and in the case of Google Chrome, fourth. This ensured that repositories are registered with directories and registries, such as ROARMAP, a registry of open-access repositories and accompanying policies

(ROARMAP, 2024), and OpenDOAR, a global directory of Open Access repositories (OpenDOAR, 2024).

Kelly (2019) writes that adding digital heritage collections and links to Wikimedia Commons and Wikipedia is a method for increasing access to digital heritage collections. This is an approach that the library will consider doing in the future. Results show that uploading data to Wikimedia Commons can result in greater reuse of this data outside of Wiki projects (Kelly, 2019), which can in turn lead to increased impact. Enriching metadata by using linked open data may have a similar effect, according to Candela et al. (2019). The library is currently undertaking the conversion of AACR2 bibliographic records on its discovery system to resource description and access (RDA) to improve the description of and access to library and cultural heritage resources.

Marsh et al. (2016) argue that storytelling is also a means of understanding and articulating the impact of digitising ethnographic and heritage materials and view it as a 'key component of impact assessment' (Marsh et al, 2016). Linked to this, storytelling and engagement can play a role in enhancing impact, especially when employing citizen science or crowdsourcing, as demonstrated by Adam et al. (2025) and Colla (2025) in their contributions relating to sourcing members of the public and library staff members to engage with collections and enrich descriptions of digital heritage objects. In both cases, this method leads to improved engagement with collections and could increase use and, ultimately, impact.

Conclusion

This study has demonstrated that while assessing the impact of digital heritage collections presents more challenges compared with institutional research outputs, viable methodologies do exist. By leveraging both quantitative and qualitative measures – such as citation analysis, user statistics and engagement patterns – it is possible to gain valuable insights into the influence of these collections within and beyond academia.

Repository managers and cultural heritage institutions should not only focus on measuring impact but also actively explore strategies to enhance the visibility, accessibility and engagement with digital heritage materials. Implementing search engine optimisation, linking collections to platforms such as Wikipedia and Wikimedia Commons, and

integrating linked open data can significantly contribute to broader dissemination and reuse. Furthermore, storytelling and participatory approaches, such as citizen science and crowdsourcing, have shown promise in fostering deeper interactions with digital heritage collections.

However, it is crucial to approach impact assessment with a critical lens, acknowledging the limitations of purely numerical metrics. Statistical indicators should be interpreted in context rather than being taken at face value. Additionally, future research could benefit from the use of automated methods to track scholarly and public engagements with digital heritage collections more comprehensively.

By continually refining both measurement techniques and outreach strategies, digital heritage repositories can strengthen their role as vital resources that contribute to scholarship, cultural preservation and public knowledge on a global scale.

References

Adam, R., Richelle, L., Simon, S. (2025). Unlocking the value of digitised heritage collections: Case studies from ULiège Library. In F. Renaville, R. Adam, & C. Oger (Eds.), *Opening up our heritage: Challenges and opportunities in digitising and promoting cultural and research collections*. Presses Universitaires de Liège, ULiège Library. https://doi.org/10.25518/978-2-87019-330-3.06

Bangani, S., Mashiyane, D., Moyo, M. & Makate, G. (2020). In/gratitude? Library acknowledgment in theses and dissertations at a distinguished African university. *Library Philosophy and Practice*, Article 3596. https://digitalcommons.unl.edu/libphilprac/3596

Borrego, A. (2020). Measuring the impact of digital heritage collections using Google Scholar. *Information Technology and Libraries*, *39*(2). https://doi.org/10.6017/ital.v39i2.12053

Burkey, B. (2022). From bricks to clicks: how digital heritage initiatives create a new ecosystem for cultural heritage and collective remembering. *Journal of Communication Inquiry, 46*(2), 185–205. https://doi.org/10.1177/01968599211041112

Candela, G., Escobar, P., Carrasco, R. C. & Marco-Such, M. (2019). A linked open data framework to enhance the discoverability and impact of cultural heritage. *Journal of Information Science*, *45*(6), 756-766. https://journals.sagepub.com/doi/10.1177/0165551518812658

Colla, J. (2025). ODIS: The contextual disclosure of heritage collections through a joint database on the history of civil society. In F. Renaville, R. Adam, & C. Oger (Eds.), *Opening up our heritage: Challenges and opportunities in digitising and promoting cultural and research collections*. Presses Universitaires de Liège, ULiège Library. https://doi.org/10.25518/978-2-87019-330-3.09

Kelly, E. J. (2019). Assessing impact of medium-sized institution digital cultural heritage on Wikimedia projects. *Journal of Contemporary Archival Studies*, *6*, Article 25. https://elischolar.library.yale.edu/jcas/vol6/iss1/25

Marsh, D. E., Punzalan, R. L., Leopold, R., Butler, B. & Petrozzi, M. (2016). Stories of impact: The role of narrative in understanding the value and impact of digital collections. *Archival Science*, *16*, 327–372. https://link.springer.com/article/10.1007/s10502-015-9253-5

OpenDoar. (2024, October 25). *Welcome to OpenDOAR*. https://v2.sherpa.ac.uk/opendoar/

ROARMAP. (2024, October 25). *Welcome to ROARMAP*. https://roarmap.eprints.org/

Shaw, E. F. (2016). Making digitization count: Assessing the value and impact of cultural heritage digitization. *Proceedings Imaging Science and Technology Archiving*, *13*, 197-201. https://doi.org/10.2352/issn.2168-3204.2016.1.0.197

Terras, M. (2015). Opening access to collections: The making and using of open digitised cultural content. *Online Information Review, 39*(5), 733-752. https://doi.org/10.1108/OIR-06-2015-0193

UNESCO. (2009). *Charter on the preservation of the digital heritage*. https://unesdoc.unesco.org/ark:/48223/pf0000179529

University of Sydney Library. (2024). *Impact beyond academia*. https://www.library.sydney.edu.au/support/publishing/impact-beyond-academia

Abstract

Measuring the impact of digital heritage collections remains a complex challenge compared with traditional institutional research outputs. Although bibliometric and Altimetric indicators provide straightforward measures for academic publications, assessing the influence of digital

heritage materials requires a more nuanced approach. This study explores methodologies for evaluating the impact of digital heritage repositories, focusing on both quantitative and qualitative measures. Using Stellenbosch University's SUNDigital Collections as a case study, the paper examines citation analysis via Google Scholar, web analytics through Matomo, and external referencing patterns to assess scholarly and broader public engagement. The findings highlight the importance of increasing the visibility of digital heritage collections through open-access strategies, search engine optimisation and integration with platforms such as Wikipedia and Wikimedia Commons. Additionally, the role of storytelling, citizen science and metadata enrichment in enhancing the discoverability and reuse of digital heritage materials is discussed. The study concludes that while statistical indicators provide valuable insights, they should be interpreted within a broader contextual framework. Future research should explore automated tracking methods to better understand the evolving impact of digital heritage collections across academic and public domains.

Keywords

Educate About Beauty: Petit Tour, Online Exhibitions as a Means of Designing a More Democratic Cultural Heritage

Teresita Scalco

In recent years, the concept of open heritage has assumed growing relevance in the field of conservation and valorisation of cultural heritage, especially in the context of architecture and design archives.[1] Open heritage refers to public accessibility and free use of cultural and documentary resources intending to promote the dissemination of knowledge and the active participation of the community in safeguarding heritage. Along with it, the digital innovation and transformation promoted by the Italian Digital Agency (AgID),[2] aimed towards public services and digital accessibility, offer new opportunities and challenge institutions to improve good practices. This approach represents a significant evolution for cultural institutions, compared to traditional conservation practices, which often limited access to archives to a restricted audience of scholars and specialists.

The collections of Archivio Progetti,[3] the research and archival centre of the Università Iuav di Venezia and part of the Documentation and Library System Unit, cover the culture of design and architecture in its vast disciplinary articulations and scales, from landscape architecture and urban planning to furniture and industrial design, as well as photography, visual arts, and visual communication of the 20th and 21st centuries. Archivio Progetti Iauv serves as a shared space for the national and international scientific community by making available primary sources (authors' drawings, grey literature, unpublished writings, and model

---

1. One of the main discussions takes place within the framework of the International Confederation of Architectural Museums (ICAM), as well as in the ICOM Italia research group Digital Cultural Heritage (DCH), established in 2015. Particular reference is made to the international conference *Disclosing futures. Rethinking heritage*, held at the Nieuwe Instituut in Rotterdam, 2–3 November 2022 (https://nieuweinstituut.nl/en/projects/disclosing-futures-rethinking-heritage).

2. https://www.agid.gov.it/it

3. https://www.iuav.it/it/strutture-didattiche-di-ricerca-e-di-servizio/archivio-progetti

collections) to balance conservation and enhance the value of the collections by creating research tools, publishing its outputs, and disseminating its heritage through exhibitions.

Sharing Culture Through Open Archive: ApOnline Integrated Digital Strategy

Our homepages and online catalogues serve as the primary digital platforms for accessing our collections. Users can download digitised materials, which are watermarked for copyright protection. Historically, our services have primarily served academics, while now, we are open to larger audiences and include public engagement activities.

When UNESCO published the report *Towards Knowledge Societies for Peace and Sustainable Development* (UNESCO, 2013), one of the keynotes was on the importance of informal education and learning by mediating content via social media and digital platforms.

Therefore, we proposed and launched a project called the ApOnline integrated digital strategy, blending web, social media communication, and digital projects. The aim was to build an open system, with an editorial plan, multimodal approach, and design interactions with the users and so-called 'extended visions' on the collections, by quoting Herbert Bayer (Harvey, 2020; Lopes, 2021).

The Petit Tour Platform: Improving Visibility and Use of Digitalised Material

Traditionally, access to such heritage has been limited to physical spaces, which often restricts the audience to those who can visit the locations. Digital exhibitions have become increasingly important in the strategies of cultural institutions for producing and disseminating knowledge. They offer several advantages, including the ability to reach wider audiences, protect fragile documents, and extend the duration of public engagement with cultural artefacts. Moreover, digital platforms allow for the integration of multimedia elements, creating richer and more engaging user experiences.

To create the digital exhibition called Petit Tour,[4] we developed an open-source platform in 2020 within the communication and IT office of our university during the COVID-19 pandemic as part of the ApOnline digital strategy to enhance the visibility and accessibility of its collections. The platform was designed by using the Instagram graphic approach and made adaptable to various curatorial and communication needs, allowing for the creation of online exhibitions that could be accessed by a global audience.

The platform is based on a content management system (CMS), which consists of a back-end system for managing the resources and a content delivery application (CDA) for the front-end interface for public access.Each small online exhibition consists of a quote, the curator's statement, and a set of 24 images presented with a dual visualization mode that fosters user interactivity, allowing both detailed and overall views. The platform also includes tools for social media integration, enhancing public engagement through interactive and visually appealing content.

An online exhibition presupposes a narrative construction of digital contents organised in chronological, biographical, thematic or semantic–associative iconographic order and allows users to:

- reconcile the potential of the media (text, images);
- reach a wider audience;
- protect documents with a fragile state of preservation;
- expose for a longer period.

Moreover, this tool:

- serves to enable learning and enrich knowledge;
- improves the public engagement of citizens;
- goes beyond academic walls and provides a better service for everyone.

Curating, designing, and producing an online exhibition involves the conciliation of humanistic and digital-technical skills, visual culture, and careful analysis of the methods of managing and communicating the content to satisfy the needs of different user groups.

---

4. https://www-archive.iuav.it/homepage/webgraphics/IUAV-PAGINE.INTERNE/IUAV-MOSTREONLINE/petit-tour.htm

We launched a call and invited professors, doctoral students, and researchers to present their research work to a wider audience. Overall, we received 11 proposals and published eight contributions. Thanks to the positive feedback, our in-residence researchers also curated an online exhibition as a scientific product and evidence of their work on the archival fund (Figure 1). The Petit Tour is an example of successful co-creation and collaboration between scientific coordinators and PhD students and archivists.
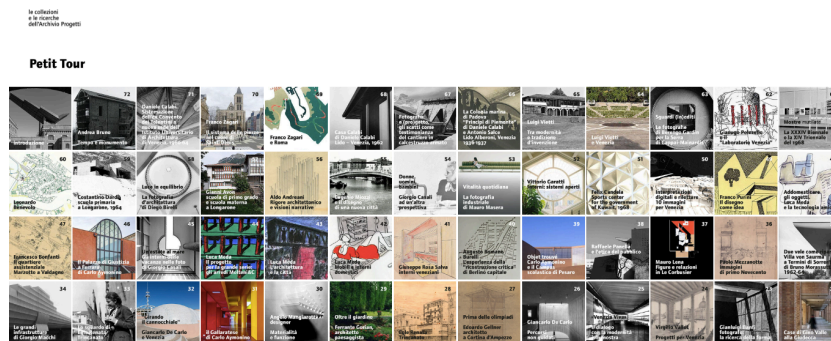
Figure 1 – Petit Tour homepage.

Case Study: Petit Tour 'Colours of Women'

Our attention has been focused on investigating women's contributions to cultural heritage in the 20th century. This research remains a work in progress, where we map well-known figures alongside others whose biographies are incomplete or even absent (Google Arts & Culture, n.d.). Many of these women were pioneers of radical and inspiring transformations that have shaped new generations of designers. In this context, we would like to highlight the two curated tours we organised on this subject.

The Petit Tour initiative, *Colori delle donne. Le progettiste italiane dal fondo di Giorgio Casali*, that we co-curated with Serena Maffioletti and Raimonda Riccini, thematically explores the archives of photographer Giorgio Casali, focusing on the vibrant women-led projects found within them (Figure 2). Both the Petit Tour and the video animation by Massimiliano Ciammaichella were presented online and on social media as part of the Italian Festival of Archives, Archivissima, and the Archive Night on 5 June 2020. The fourth edition of the festival, promoted

by Promemoria, was dedicated to the theme 'Women' and featured stories of change and transformation. The social analytics showed a large visualisation of the exhibition (over 9,000 visualisations from Facebook, Instagram posts, and YouTube).

Figure 2 – Entrance box of the Petit Tour *Colori delle donne*.

The collections of Archivio Progetti contain an archive of the first woman to graduate from the Iuav School of Architecture in 1928, Egle Renata Trincanato, who recognised photography as a valuable design language beyond the visual. This online exhibition *Lo sguardo di Egle Renata Trincanato*,[5] which we curated in 2021, intended to position Trincanato's contribution within the 'history of gazes' as defined by Roland Barthes, in the visual culture of contemporary architecture. That small e-exhibition is an example of how digital platforms can be used to discover underrepresented groups in cultural history, showcase the work of women, educate the public on the ongoing discourse on gender equality in the field of design, and move beyond (United Nations, n.d.).

Of late, we are facing a shift in producing and accessing our collections. The rapidity of digital developments has already allowed us to talk about 'digital archaeology' for the fast obsolescence of digital platforms. If, on one hand, digital tools enable broader access to collections, on the other hand, protocols for long-term preservation are still being developed.

---

5. *Lo sguardo di Egle Renata Trincanato*, https://www-archive.iuav.it/homepage/webgraphics/IUAV-PAGINE.INTERNE/IUAV-MOSTREONLINE/EGLE/egle.htm.

The primary goal is to maintain websites and digital platforms in their original state, ensuring that information remains accessible and usable over time. Second, it is crucial to guarantee the authenticity and integrity of metadata by mentioning its structure and usage rights to ensure legitimate access to information. An outstanding project developed by the Biblioteca Nazionale Centrale di Firenze on web archiving aims to collect, preserve, and guarantee accessibility to web content related to Italian history and culture. The access to website collections is organised thematically, and to perform automatic collections (harvesting), websites must allow access to the Archive-it bot.

In 2010 the term 'phygital' was officially recognised by the Accademia della Crusca in Italy, combining the terms physical and digital retail experience. This term now appears to be the new key to innovation in the cultural milieu as well.

The question remains as to what will happen next. It is certain that very soon, when applied to digital tools, online catalogues, and platforms, artificial intelligence (AI) will change the ontology of the structures of our activities and will considerably impact the way we present and produce exhibitions online. Furthermore, AI will be transformative in the way we manage architectural, design, and photographic collections.

For instance, AI-driven technologies like handwritten text recognition (HTR) and entity recognition (NER) enable the automatic transcription and identification of historical texts and locations, making archival materials more searchable and accessible to researchers and the public (Patton, 2024). However, AI integration into these processes raises significant copyright issues, as the use of AI-generated content may blur the lines between original and derivative works, potentially infringing on existing copyrights. The forthcoming EU AI Act 2025, which will be effective in August 2025, is expected to address some of these challenges by providing clearer guidelines on the use of AI in cultural contexts. This legislation could offer opportunities for more transparent and ethical AI applications, ensuring that AI tools respect intellectual property rights while promoting innovation in cultural heritage management.

Despite these potential benefits, there are limitations to consider. To effectively integrate AI tools into these processes, cultural institutions must adopt a balanced approach that respects both the creative potential of AI and the need to preserve cultural authenticity. This process involves developing AI systems that can work in tandem with curators to enhance user experiences without altering the core narrative of cultural artefacts.

Moreover, the ethical considerations surrounding AI's role in the field of cultural heritage are multifaceted and open to interdisciplinary contributions.

Needless to say, on one hand, AI can democratise access to cultural artefacts by making them more accessible to a broader audience with good digital literacy. On the other hand, there is a risk of cultural homogenising or misrepresentation if AI algorithms are not carefully designed to respect cultural diversity and contexts since these algorithms work only on the already available digital heritage.

Nevertheless, the AI Act 2025 also addresses ethical and deontological concerns by promoting transparency and accountability in AI applications. Meanwhile, cultural institutions will contribute to ethical and visual literacy regarding the management and safeguarding of the authenticity and integrity of cultural narratives.

Conclusion

The transition to digital platforms, as exemplified by the initiatives of Archivio Progetti, illustrates a significant paradigm shift in cultural heritage preservation and dissemination. The Petit Tour initiative showcases the advantages of digital exhibitions in reaching global audiences, safeguarding delicate materials, and fostering public engagement beyond academic circles. The case study on women's contributions underscores the role of digital tools in addressing underrepresented narratives and advancing gender equality in design history. However, the dynamic nature of digital innovation, including the emergence of AI, poses challenges and opportunities that demand continuous adaptation and strategic foresight from cultural institutions. The convergence of physical and digital (phygital) experiences is poised to redefine the ontology of cultural activities, paving the way for innovative approaches in exhibition production.

References

Google Arts & Culture. (n.d.). *Women in culture*. https://artsandculture.google.com/project/women-in-culture

Harvey, F. (2020). Herbert Bayer's *World geo-graphic atlas* of 1953: A modern atlas, then and now. *The Cartographic Journal*, *57*(3), 273–283. https://doi.org/10.1080/00087041.2020.1824745

Lopes, R. (2021). Exhibition design and the relationship with the spectator: historical notes with El Lissitzky and Herbert Bayer. In F. Vukić & I. Kostešić (Eds.), *Lessons to learn? Past design experiences and contemporary design practices: Proceedings of the ICDHS 12th international conference on design history and design studies* (pp. 25–35). UPI2M Books.

Patton, S. (2024, October 21). *AI meets archives: The future of machine learning in cultural heritage*. Council on Library and Information Resources. https://www.clir.org/2024/10/ai-meets-archives-the-future-of-machine-learning-in-cultural-heritage/

UNESCO. (2013). *Towards knowledge societies for peace and sustainable development, first WSIS+10 review event: outcomes*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000224604

United Nations. (n.d.). *Goal 5: Achieve gender equality and empower all women and girls*. United Nations. https://www.un.org/sustainabledevelopment/gender-equality/

Further Readings

Adichie, C. N. (2015). *We should all be feminists*. Einaudi.

Kalantzis, M., & Cope, B. (2017). *E-learning ecologies*. Routledge.

Mansell, R., & Tremblay, G. (2013). *Renewing the knowledge societies vision for peace and sustainable development*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000224531

Marsh, E. (2023). *Creating digital exhibitions for cultural institutions. A guide*. Routledge.

Nochlin, L. (2019). *Representing women*. Thames & Hudson.

Simon, N. (2010). *The participatory museum*. Museum 2.0. https://participatorymuseum.org

Abstract

The concept of 'open heritage' has gained increasing importance in the field of cultural preservation and enhancement, particularly in architecture and design archives. This paper explores the evolution of accessibility in cultural institutions, with a focus on the digital initiatives of the Archivio Progetti at the Università Iuav di Venezia. The ApOnline

integrated digital strategy exemplifies the blending of web platforms and social media to broaden public engagement, culminating in the creation of the Petit Tour platform. This platform utilises an open-source design to present curated online exhibitions, integrating multimedia elements and offering interactive, user-friendly interfaces. A notable case study, *Petit Tour: Colours of Women*, highlights efforts to uncover and celebrate women's contributions to cultural heritage, demonstrating the transformative potential of digital platforms in promoting inclusivity and preserving fragile materials.

Keywords

Digital cultural heritage; Research tools; Online exhibitions; Exhibiting archives; Public engagement; Digital accessibility

Part IV

Engaging Users and Communities

Strategies for Promoting the Use of Digital Cultural Heritage Collections With Student and Researcher Engagement

Marika Sarvilahti

As the activities of preserving digital assets and providing access to them have become key functions for digital collection management at memory organisations, the question of user engagement has perhaps been less explored amidst other challenges. This paper will discuss three different strategies implemented at Aalto University, Finland. The strategies include, first, integrating digital cultural heritage into information literacy training; second, developing an online guide for visual resources including digital cultural heritage; and third, inviting graduating students to participate in an artist residency for making an in-depth exploration of the university's archival and cultural heritage resources. The experience of direct cooperation with academic programmes to provide opportunities for students to learn how to use archival collections and primary sources for research and creative projects has also been highly positive.

Moreover, the paper will briefly discuss how digital cultural heritage could be further examined in information literacy research as an information source with some distinct information behaviours that require a literacy skills definition and a set of competencies of their own. Digital cultural heritage literacy is closely related but distinguishable from information literacy skills that have traditionally focused on library resources.

Does Digital Cultural Heritage Need Promotion?

The investment in mass digitisation efforts by libraries, archives, and museums has resulted in students and researchers having now access to millions of digital heritage objects online (e.g. texts, images, audiovisual content, and artworks). Simultaneously, users have increasing availability to digital content on multiple media sharing and social media platforms. As information specialists, we have taught information literacy (IL) classes for over 15 years in the higher education context. Over time, we have become aware of the low awareness of digital cultural heritage

collections amongst students and even postgraduate researchers. In particular, students in humanities, art, architecture, and design often require a variety of information sources in their work, written assignments, and creative projects. They research trends and phenomena in art, architecture, urban planning, and design history, to name a few fields. Teachers also make explorations into visual content for inspiration and illustration.

While there is a definite need for visual information, there seems to be a gap in knowledge about digital cultural heritage as a potential source. When students approaching their first research assignments are asked how they find visual material for their research or creative projects, they name popular image-sharing and social media platforms such as Instagram, Pinterest, or TikTok. The image and video content may be highly relevant on these platforms for some information needs, but the platforms are inadequate as sources of trustworthy, high-quality content that is licensed and also supports research into the provenance and context of cultural phenomena. Digital cultural heritage platforms such as Europeana, which aggregates access to millions of images from European cultural organisations, are not commonly mentioned as being part of these users' usual information-seeking routines. Without fail, the students express surprise at the resources available to them once they are introduced to digital cultural heritage as an information source and state that they wish they had known about them earlier.

The digitisation of collections and provision of online access are necessary steps towards safeguarding both preservation and access. Preservation and access should, however, be at least equal in terms of investment. Agosti et al. (2018) take access slightly further, stating, '[i]mportant though preservation undoubtedly is, access is more important still. Indeed, the act of conservation implies a need for access – we may access material that we do not bother to preserve, but we do not, in a world of limited and diminishing resources, preserve what we do not wish to access' (Agosti et al., 2018, p. 353). Pettersson (2022) has also observed that cultural heritage and primary resource collections held by university libraries and archives are rich, valuable resources that are unknown to most students, and these resources challenge the remits of traditional IL training in terms of curatorship and pedagogy. Cooperation between library and archival instruction has, to date, been limited. Memory organisations are still working in siloes of the library, museum, and archive, although the boundaries are blurred for users of cultural heritage platforms such as Europeana. Opening up digital

heritage collections should also mean having some strategies for supporting user training and user engagement with the collections.

Preserving and Accessing Cultural Heritage at Aalto University

Aalto University is a multidisciplinary university based in the capital region of Espoo, Finland. The University has six schools specialising in topics such as arts, design, architecture, business and economics, engineering, physics, and computer sciences. A distinctive feature of the university is its various practice-based academic programmes. For instance, in the art, design, and architecture programmes, the learning and research outputs include practical design projects, exhibitions, and competitions where the learning outputs are, for instance, objects of fashion, visual design, architectural design, or product design, even complete gaming environments or other 'virtual experiences'. This focus on practice-based learning influences both the information needs of the students as well as the outputs that are preserved.

Students need a wide range of information resources from which to learn and with which to create new ideas. The Aalto University Learning Centre provides a library and special collections to facilitate these competencies, including access to image databases in arts and humanities. Students in the design and visual arts programmes conduct visual research by exploring historic images to generate visual ideas and study trend developments and cultural phenomena. For example, architects look for images of certain periods, architects, and styles. Likewise, fashion designers look for images of certain styles, designers, and types of garments, while designers look for materials, colours, patterns, typography, and inspiration images of all kinds. Digital collections from memory organisations have a wealth of resources for these kinds of requirements.

In addition to the Learning Centre, the University Records Management also manages cultural heritage and primary source collections and promotes their use to students. The Archives is responsible for capturing, preserving, and providing access to the University's heritage and supports access to the material online on the Archives Finna platform.[1] In addition to official records and documents, the preserved material includes artistic

---

1. https://aaltoarkisto.finna.fi/

activities related to theses and dissertations; student exhibitions; and other major artistic activities, such as images from fashion catwalks and design competitions. The materials are part of the university's legacy and also an information source for students. The Archives has a long-standing cooperation with degree programmes, whose members regularly visit to learn about accessing, using, and making creative explorations of the archive collections. Students first engage with the University's own digital archives and collections – and often with archive collections and digital cultural heritage as information sources, in general – in this context.

Digital Cultural Heritage and Information Literacy

Information literacy training usually provided by academic libraries focuses on the skills required in the process of gaining information. Commonly adopted learning objectives for this training, named *Framework for Information Literacy for Higher Education*, were established in 2016 by the Association of College and Research Libraries (ACRL). In the *Framework*, information literacy is defined as 'the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning' (ACRL, 2016, p. 3). A skilled user of information is understood to 'look beyond format when selecting resources to use' as the process of information creation will today result in different kinds of formats and modes of delivery (ACRL, 2016, p. 5).

The *Framework for Visual Literacy in Higher Education* was published by the ACRL in 2022 to broaden to applicability of the *Framework for Information Literacy* to visual information formats. Given these standards, visual literacy is not seen as relevant only to the students in the arts but as highly multidisciplinary and applicable to all 'citizens in today's image-saturated society' (ACRL, 2022, p. 2). Learning skills in visual literacy allows individuals to develop abilities to engage with the rapidly evolving technological landscape where visual information is created, manipulated, and, also, machine-generated. In 2020, the concept of cultural heritage literacy also began appearing in IL literature. For example, Öztemiz (2020) studied the cultural heritage skills of academics and found four core competencies for cultural heritage literacy: discovering and accessing, analysing and evaluating, using and creating, and sharing. It appears that the definitions of information

literacy are, therefore, becoming broader and more inclusive of different kinds of literacies of information sources.

A potential area for further research is to explore the impacts of information literacy training, which has traditionally centred on text-based information sources within the library context, and to understand how this training may need to be adapted to encompass a wider range of information formats. Information literacy training may increase its impact and relevance if it is modifiable for a heterogeneous range of information formats (e.g. text, image, data, archival resources). Overlapping themes can also easily be found in the core learning objectives of critical and ethical use of information regardless of format. Taking a more integrated approach beyond the siloes of the library, archive, or museum will help learners make better use of digital cultural heritage as 'unlocking any values in mass-digitised heritage data will require economic investment in skills' (Terras et al., 2021, p. 7).

Strategies to Promote Digital Cultural Heritage

The raising of awareness about digital cultural heritage as an information source at Aalto University has been assisted, on the one hand, by the Learning Centre having a long-standing IL training programme and, on the other, by the presence of some dedicated activities and cooperation that focus on visual resources and archival material. This section introduces the strategies and practical implementations: the integration of digital cultural heritage into IL training and cooperation with degree programmes, an online guide for visual resources, and the artist residency for graduating students.

1. Integration to information skills training

Students attending IL training at any degree level have an opportunity to learn about visual resources and, through that, digital cultural heritage in a formal training setting. A course named 'Visual Resources and Image Retrieval' has been offered by information specialists, and it typically covers the following:

- Image retrieval in the context of academic learning and research
- Introduction to digital cultural heritage
- Image databases and digital cultural heritage platforms
- Strategies for using image search engines
- Evaluation of reliability and quality

- Image metadata including provenance and context
- Image licenses and copyright issues
- Image citation practices

Components from this formal course are also often integrated into various course programmes that fall under the common themes of visual research skills for thesis writers, remix and heritage hacking for designers, and working with cultural heritage and primary sources.

In each training, regardless of the course level or programme, large aggregated digital cultural heritage portals such as Europeana, Finna, Artstor, and Digital Public Library of America are introduced to students and researchers. Furthermore, the university's archive and special collections are introduced in instances where there is often an opportunity to explore special and rare originals, to help students understand that there is also a wealth of primary resources that are not in digital format. Students learn about the different kinds of cultural heritage, understand why this knowledge may be useful to their study skills, and focus especially on finding high-quality visual resources and navigating the often-troublesome copyright questions and citations.

2. Visual Resources Online guide for self-learning and reference

To enable also self-paced online learning, the Aalto University Learning Centre has collaborated with the University of the Arts Library and the Aalto University's legal advisors in the ImagOA – Open Science and Use of Images project.[2] The guide provides information and infographics on the use of visual resources considering the practice of open science and culture. The guide also highlights resources that have been openly licensed as many cultural organisations have adopted OpenGLAM principles to 'strengthen their brand, disseminate content and encourage innovation' (Terras et al., 2021, p. 2). The guide contains a curated collection of image databases and digital cultural heritage platforms; information on citation practices; Creative Commons licenses; permitted uses of images on educational materials, theses, publications and artistic activities; and photographs as personal data.

The guide was published on the LibGuides platform in Finnish, Swedish, and English with open CC-BY licensing and has, hence, been

---

2. https://libguides.aalto.fi/vrc

widely adopted and modified by other Finnish University Libraries for their own use. The guide uniquely brings together digital cultural heritage collections, information on copyright issues and good citation practices. The guide is also used as an instructional tool in IL training and provides a reference after training to make further discoveries with the resources.

3. Artist residency for a graduating student

In addition to efforts on training and learning resources on digital cultural heritage, the university's archival resources have also facilitated creative work. A residency programme is provided for a graduating student or researcher to make an active exploration of the university archive's collections with the help of and instructions given by archivists and the information specialist. The residency covers introductions to collections, in-depth interviews and discussions with the specialists about the topics chosen by the residency holder, and the allocation of a physical or digital exhibition space for a final project outcome.

The residency provides visibility for the residency holder's final thesis work and creative achievements. For example, Anjori Tandon from the Visual Communication Design degree programme attended the artist residency and successfully completed her MA thesis in 2023 exploring the use of AI generative methods with archival materials (Tandon, 2023). She was inspired by the Aalto University Archive's rare book collection and, specifically, the archive's collection of richly illustrated loose-leaf albums from the late 19th and early 20th centuries. Tandon selected some of these prints and created 3D digital models with generative AI methods using openly licensed archival resources.[3] In her words, the residency and the archival material she explored 'provided a significant source of ideas, styles, and cultural contexts that counteract the repetitive character of the current visual design scenario [and it] opened my eyes to the possibility of using archives for visual design' (A. Tandon, personal communication, June 9, 2024).

Conclusion

We compete for the attention of students and researchers in the information- and media-saturated culture. There could be more strategic user engagement planning for increasing the awareness of digital cultural

---

3. https://anjoritandon.com/Digi-BOTANICA

heritage, for example, through formal user training, building online guides and reference tools, or facilitating creative use. The feedback from user training, which integrates digital cultural heritage training into formal information literacy classes, particularly encourages the understanding that students appreciate a wider view of information sources. After each session, there is a brief reflection where students discuss how the new resources may affect their future information-seeking behaviour. They often reflect on how the training has opened their eyes to entirely new resources available to them. Despite encouraging feedback, it should be acknowledged that the approach at Aalto University depends on the specialist training skills available and the continued allocation of formal teaching into tightly scheduled course curricula.

We have a task on our hands in upskilling ourselves and our users. Raising awareness of digital cultural heritage may mean crossing some professional boundaries. Memory organisations provide access to digital cultural heritage often in aggregated platforms that blur the boundaries of the archive, library, and museum for the user. This method is effective for memory organisations and provides real advantages for the user. Information professionals should, therefore, investigate how to broaden their knowledge and skills in different kinds of information formats, cultural organisations, and information literacies. The role of the librarian and archivist may also shift from relatively passively providing collections and information to actively planning and facilitating user engagements that advance skills and competencies. This shift will be mutually beneficial for those who attend and those who provide the engagement.

References

Agosti, M., Orio, N., & Ponchia, C. (2018). Promoting user engagement with digital cultural heritage collections. *International Journal on Digital Libraries*, *19*(4), 353–366. https://doi.org/10.1007/s00799-018-0245-y

Association of College Research Libraries (ACRL). (2016). *Framework for information literacy for higher education*. https://www.ala.org/acrl/standards/ilframework

Association of College Research Libraries (ACRL). (2022). *Companion document to the ACRL framework for information literacy for higher education. The framework for visual literacy in higher education*.

https://www.ala.org/sites/default/files/acrl/content/standards/Framework_Companion_Visual_Literacy.pdf

Öztemiz, S. (2020). Cultural heritage literacy: A survey of academics from humanities and social sciences. *Journal of Librarianship and Information Science*, *52*(3), 818–831. https://doi.org/10.1177/0961000619872529

Pettersson, K., (2022). Teaching information literacy in the humanities: Engaging students with primary sources and cultural heritage material. *Nordic Journal of Information Literacy in Higher Education*, *1*(1), 56–62. https://doi.org/10.15845/noril.v13i1.3782

Tandon, A. (2023). *'The herbarium of digi-botanica': 3D digital models created through generative procedures using visual archival resources*. [Master's thesis, Aalto University]. Aalto University repository. https://urn.fi/URN:NBN:fi:aalto-202401281833

Terras, M., Coleman, S., Drost, S., Elsden, C., Helgason, I., Lechelt, S., Osborne, N., Panneels, I., Pegado, B., Schafer, B., Smyth, M., Thornton, P., & Speed, C. (2021). The value of mass-digitised cultural heritage content in creative contexts. *Big Data & Society*, *8*(1). https://doi.org/10.1177/20539517211006165

Abstract

This paper discusses the significance of user engagement in preserving and providing access to digital cultural heritage in memory organisations, with a focus on strategies implemented at Aalto University in Finland. The paper outlines three key strategies: integrating digital cultural heritage into information literacy training, developing an online guide for visual resources, and inviting graduating students to participate in an artist residency for an in-depth exploration of archival resources. It emphasises the need for increased awareness of digital cultural heritage among students, particularly those in humanities, art, architecture, and design programmes, as well as the potential consequences of a lack of knowledge about digital cultural heritage. The essay also touches upon the evolving definitions of information literacy and the need for broader skills encompassing diverse information formats, including text, image, data, and archival resources. The user engagement initiatives at Aalto University aim to raise awareness of digital cultural heritage, provide interfaces for learning opportunities, and facilitate creative engagement with the resources. This paper emphasises the significance of user

engagement planning and upskilling in digital cultural heritage, as well as the evolving role of information professionals in facilitating user engagements.

Keywords

Digital cultural heritage; User engagement; Higher education; Archival materials; Primary resources; Visual resources; Information literacy; Visual literacy; Artist residencies

The Deported to Bărăgan Project: Public Accessibility in Research Archives

Mălina Duță

The article describes the integration of a new, atypical collection of documents into the patrimony of the Eugen Todoran Central University Library in Timișoara and how a part of it is used in order to preserve and research the collective memory of traumatic historical events. The collection contains a corpus of interviews, as well as other documents – memoirs, journals, photographs, monographs, and so on – that address various aspects of the sociocultural identity of Banat, including ethnicity, religion, micro-regions, education, professional life, and generational memory.

The interviews and other oral history materials that comprise this collection were brought together by the Group for Oral History and Cultural Anthropology of the *A Treia Europă* Foundation, coordinated by Associate Professor Dr. Smaranda Vultur. Later, the entire corpus was donated to the Central University Library. The long term aim with this collection, designed as an Oral History Archive, is not only to provide interested parties – students, professors, and researchers – with unique materials that broaden the current perspective on the identities of Banat and Timișoara, but also to establish a virtual memorial space, accessible online, that would facilitate explorations of memory and identity from an interdisciplinary perspective.

Establishing an Oral History Archive

The Oral History Archive has been in the library since 2016, and much work has been done since then to organize, catalogue, digitize, and make its contents available, in various forms, to the public.

The corpus of the Oral History Archive (*Arhiva de Istorie Orală*) contains 486 interviews (testimonies), along with related documents (Biblioteca Centrală Universitară 'Eugen Todoran', n.d.). These materials were collected by students and researchers between 1991 and 2022 (at significantly slower pace from 2012 to 2022), with most recordings initially made on audio cassettes. These interviews followed the 'life story' format, where interviewees were encouraged to speak freely, with

minimal intervention from interviewers. The corpus traces a map of the social life and cultural memory of the inhabitants of the Banat region and Timişoara. The interviews were developed to illustrate a wide range of intercultural and memorial practices.

Defining an Interview

What we generically call an 'interview' is, in this case, a multi-document, or a unit composed of multiple elements. Thus, a complete interview consists of the following:

- The physical storage medium: Information may be stored on an audio cassette or, in more recent cases, on a CD, hard drive, or USB stick.[1] An interview may be recorded on part of a cassette, an entire cassette, or even multiple cassettes. To date, 577 cassettes have been inventoried, some of which have undergone physical degradation, resulting in distorted audio. Technical staff are working to restore these materials. When a single cassette contains two or even three interviews, it poses challenges for cataloguing and storing it in an organized manner, as the interviews are grouped thematically and, in some cases, the themes of the interviews differ.
- The interview file: This standard-format file contains essential information about the interview, including the date and location of the recording, the interviewer's name, and specific details about the content of the interview.
- Interview transcripts: Most interviews were transcribed by the interviewers at the time they were conducted. This was not always the case though, so a part of these interviews had to be transcribed by the librarian in charge of the archive. Transcription is a time-consuming task that requires significant focus and attention to detail. At times, linguistic challenges were present, as older individuals sometimes used terms from multiple languages, the region of Banat being multi-ethnic and multi-linguistic. In these cases, the transcriber had to search for and clarify the meaning of these terms.

---

1. The interviews were transcribed, and the library keeps both hard copies and digital copies of the transcriptions. The materials previously stored on CDs and DVDs are currently being moved to safer digital storage mediums (hard drives and online).

- Additional documents (photographs, journals, postcards, letters, etc.): These were donated by interviewees. In some cases, individuals donated multiple photographs, raising questions about whether these should be inventoried and described individually or as a photo group by the librarian-cataloguer.

Methodology

To clarify the process by which each interview was inventoried and catalogued, a concrete example would be helpful: the interview of Margareta Oglindă, born in Banat in the village of Iecea Mare and deported first to the USSR (1945) and then to Brateș (also known as Frumușița) in Bărăgan (1951). The archive contains five cassettes of Mrs Oglindă's interview and its transcript. The data has been recorded in a centralized inventory table, and several aspects have been noted for each interview: the interviewee's full name, ethnicity, cassette details (quantity, numbering, etc.), whether the cassettes have been digitized as MP3 files, whether the interviews have been integrated into the Aleph library system, and other pertinent observations, such as the interviewee's maiden name (if applicable) or the place of deportation.

The team that currently works on the Oral History Archive is composed of three persons: a cultural anthropology expert who focuses on the content and academic use of the interviews, an IT expert, and a cataloguer who creates and manages entries in the Aleph online electronic catalogue. The anthropologist and the cataloguer work together closely in order to select key words to be used as headings for each interview. It is the first time that such atypical documents are being catalogued in Romania in the Aleph library system, and thus the cataloguer is creating new authority files for this collection. This is considered a work in progress, and the quality and scope of the authority files are being constantly improved. The IT expert is in charge of uploading and updating the materials that pertain to the Deported to Bărăgan project on the dedicated website. There are currently no hyperlinks in place between the Aleph electronic catalogue and the website. The digitized recordings have not been uploaded on Aleph due to lack of personnel.

The interviews are physically grouped according to thematic criteria, such as ethnicity, cities or geographical areas mentioned, and historical events (war, deportation, etc.). For instance, though Margareta Oglindă's married name is Romanian, she is ethnically German. Given that she

experienced two deportations – first to the USSR in 1945, and then to Bărăgan in 1951 – her interview is categorized under the 'deportations' thematic group.

The Deportations to Bărăgan

Of the 486 interviews in the Oral History Archive, 107 fall into the thematic group concerning the Bărăgan deportations, which were enforced between 1951 and 1956.

Between 1951 and 1956, Romania witnessed a significant wave of internal displacement enforced by the communist regime. These actions, known as the deportations to the Bărăgan plain, represented one of the more severe forms of oppression during this period. Unlike deportations that involved expulsion across national borders, these were structured as compulsory domiciles, forcing individuals into new settlements in the plain of Bărăgan, a steppe plain in south-eastern Romania, where weather conditions were harsh and, at least at the beginning of the displacement, resources were scarce. The relocation, or deportation, was aimed primarily at individuals perceived as threats to the stability and ideology of the communist regime, although the group of deportees included a broad spectrum of people whose only commonality lay in the suspicions cast upon them by the state.

The Bărăgan deportations primarily affected people from the Banat region, although the exiled were not exclusively from this area. In total, about 44,000 persons were deported. This relocation effort was targeted at those labelled as 'hostile elements', a label that broadly encompassed individuals whose socioeconomic backgrounds, political beliefs, or ethnic identities were deemed incompatible with the goals of the state. The Romanian Communist Party identified these groups as potential threats to state security, marking them for displacement. Included in this classification were landowners, prosperous farmers, villagers residing near the Yugoslavian border, political prisoners, ethnic Germans, and those suspected of espionage activities or anti-regime sentiments. Vultur (2021) has researched this topic extensively, also studying the nominal tables drawn up by the Ministry of Internal Affairs listing the professions of the deported persons:

> In the case of those registered in the above tables, the persons had most diverse trades or professions – farmer, carpenter, lawyer, doctor, accountant, printer, merchant, butcher,

> winemaker, teacher, artist, worker, writer, photographer, housewife, painter, pharmacist, shepherd, student, banker, business owner, manufacturer, typist, electrician, shoemaker, etc. They were evicted from their house and forcibly displaced to other localities, where they were assigned compulsory domiciles according to the provisions of Decree no. 239/1952. (Vultur, 2021, p. 46).

Families were often included in the relocation orders, meaning that the dislocation impacted individuals across generations, from young children to elderly family members. After being notified of their impending displacement, deportees were permitted to take only a limited number of personal belongings, often insufficient to meet their needs in the unfamiliar environment of Bărăgan. Upon arrival, they were provided minimal, if any, assistance from the authorities, who abandoned them in open fields and left them to construct shelter and organize their lives with whatever limited resources they could gather. Later on, they would be assigned working places in nearby farms.

The psychological toll of deportation was as profound as the physical hardships. For those affected, deportation to Bărăgan was not merely a forced change in residence, but an experience marked by oppression, fear, and uncertainty about their future. The constant surveillance and suspicion that followed them mirrored the broader atmosphere of fear cultivated by the regime.

Over time, the experiences and memories of deportation to Bărăgan were passed down through generations. The psychological impact of these experiences has been reflected in the narratives of those who were interviewed about the deportations: 'Studies concerning the deportation reveal that the greatest trauma was suffered by the children.' (Vultur, 2021, p. 59). While some accounts emphasize the persistent scars left by the trauma, others highlight a sense of pride in having survived such adversity. For many deportees and their descendants, the experience of having endured the Bărăgan deportations became a source of personal and collective strength.

However, the deportations to Bărăgan were a relatively unknown phenomenon immediately after the 1989 Romanian Revolution, as they were not discussed during the communist years. Consequently, the testimonies only began to emerge after 1989, and some of those persecuted during that time were already elderly. A race against time

began to enable the witnesses to share their stories. Researchers in the humanities were particularly interested in these narratives, and thus, the task of recording interviews commenced (Lazǎr, 2023). Still, it was not enough to simply gather testimonies and documents; it was essential to make them accessible to the general public.

The Deported to Bărăgan Project

To make the testimonies of former Bărăgan deportees more accessible, a small team from the Eugen Todoran Central University Library, in collaboration with the Association of Former Bărăgan Deportees, initiated the creation of a website.[2] Launched in June 2016, the site hosts the 107 interviews related to Bărăgan from the library's collection, providing descendants, the general public, and researchers with resources such as audio interviews, their transcripts, photographs, bibliographic lists of additional readings on deportation, and files from the archives of the Ministry of Internal Affairs and the Securitate (secret police) from the communist era.

In 2022, the site was updated for improved functionality. Users can now search entries by the deportee's name (if known) or by the location of deportation. There were 18 new settlements where deportees were forced to reside: Brateş, Bumbăcari, Dâlga, Dropia, Ezerul, Fundata, Lăteşti, Măzăreni, Movila Gâldăului, Olaru, Pelican, Răchitoasa, Rubla, Salcâmi, Schei, Valea Viilor, Viişoara, and Zagna.

One of the website's most significant features is its audio library. Users can listen to the MP3 files of interviews with former deportees. Listening to these voices can be profoundly revealing – the tone, inflection, and pauses convey the meaning of the discourse in a way that brings the interviewees closer to the present reality of the listener.[3]

Another compelling feature of the website is the ability to access portions of the documentation compiled by the communist-era Securitate (the political police) and the Ministry of Internal Affairs concerning the

---

2. https://deportatiinbaragan.ro/

3. As an example, Margareta Docea (born Schannen) recounts how, when she was a child, Russian occupiers entered their family home and took her parents' wedding rings and her gold earrings: https://deportatiinbaragan.ro/index-persoane/margareta-docea-rachitoasa-giurgienii-noi/.

deportees. This feature allows users to view typed lists from the 1950s, annotated by hand, without having to visit the National Council for the Study of the Securitate Archives in Bucharest in person.

The *Deportați în Bărăgan* portal serves multiple functions. On the one hand, it fulfils a sociocultural role, preserving and transmitting the memory of events that profoundly shaped the lives of a significant number of individuals. On the other hand, the site provides unrestricted access for students, researchers, and the general public to unique historical information and rare documents that would otherwise be difficult to obtain, particularly in physical form. For example, the visual artist Renée Renard has used some of the photographs in the library collection to advance her work concerning the history of her family and to explore the links among collective history, individual memory, objective realities, and emotional landscapes (Nițiș, 2024).

The interviews on the site are not merely sources of information; they are narratives that convey meaningful messages. Emphasizing this aspect is crucial, as one of the major goals of the project is to facilitate analysis of how cultural patterns have evolved over time. Simultaneously, these narratives reshape contemporary perspectives, influencing our understanding of the world in which we live.

Conclusions and Challenges

The Deported to Bărăgan project represents a significant endeavour for the preservation and dissemination of historical memory, shedding light on a lesser-known chapter of Romania's past. Through integrating oral history interviews, archival documents, and multimedia resources into a publicly accessible digital platform, the initiative provides a unique opportunity to engage with personal narratives of displacement and resilience.

The project not only contributes to academic research in the humanities, but also plays a crucial role in public history by fostering a deeper understanding of the sociocultural impact of forced deportations. The testimonies gathered illustrate the complexities of memory, identity, and trauma, ensuring that the voices of those affected by the Bărăgan deportations are neither forgotten nor marginalised.

Despite these achievements, significant challenges persist, particularly in terms of archival maintenance and digitisation. One of the primary difficulties is the lack of dedicated personnel. The team members

working on the Deported to Bărăgan project are involved in multiple research and administrative tasks, resulting in a slower pace of progress. This limitation affects not only the digitisation of materials, but also the ability to effectively integrate them into broader research networks.

Nevertheless, despite its small size, the team curating the Oral History Archive has made remarkable strides in ensuring access to these valuable testimonies. Their efforts have facilitated public engagement with personal histories that might otherwise have remained inaccessible, allowing future generations to gain a deeper understanding of this crucial period in Romania's history.

Moving forward, further development of the project – through increased institutional support, funding, and interdisciplinary collaboration – will be essential in overcoming these challenges. By strengthening the links between the *Deportați în Bărăgan* platform and academic resources, the project can continue to expand its reach and impact, serving as a model for similar initiatives in oral history preservation.

Ultimately, the Deported to Bărăgan project underscores the importance of making historical narratives accessible, not only for researchers, but for all those who seek to understand the intricate interplay between personal memory and collective history.

References

Biblioteca Centrală Universitară 'Eugen Todoran'. (n.d.). *Arhiva de Istorie Orală [Oral History Archive – Corpus of interviews, photographs, journals, and other documents]*. Timișoara.

Lazăr, D. (2023). *Imaginarul unei deportări: deportarea în Bărăgan [The Imagery of Deportation: the Deportation to Bărăgan]*. [Doctoral dissertation, Universitatea de Vest din Timișoara].

Nițiș, O. (2024, August 6). Renée Renard: 'Trăim într-o societate, în care memoria este uneori doar asociată cu capacitatea de stocare a telefonului mobil'. *Propagarta*. https://propagarta.ro/interviuri-acasa-la-in-atelier-la/peopleofgeorge/renee-renard-traim-intr-o-societate-in-care-memoria-este-uneori-doar-asociata-cu-capacitatea-de-stocare-a-t elefonului-mobil/

Vultur, S. (2021). *A radiography of repression: The deportation to Bărăgan 1951–1956*. Editura Mirton.

Abstract

The Deported to Bărăgan (*Deportați în Bărăgan*) project is aimed at at bringing to light and disseminating a collection of oral history interviews (testimonies), unique photographs, audio files, former secret police archival materials, and other documents that highlight the forced displacement (deportation) of a part of the population from the Banat region of Romania to the Bărăgan plain – during the Soviet occupation of Romania (the 1950s). The material is part of the Oral History Archive of the Eugen Todoran Central University Library of Timișoara, Romania, and can currently be accessed through the website https://deportatiinbaragan.ro/. In this paper, we shed light on the work that has been done to bring this corpus of documents into the public conscience and underline the importance of such an initiative.

Keywords

Oral history archive; Collective memory; Atypical library document; Banat region; Deportations; Digitisation

Fostering National Collaboration With Human-Centred Design and Co-Creation in Cultural Heritage Material Curation – Strategic and Operational Learnings From Finna.fi

Riitta Peltonen

Over the past five years, the Finna Services[1] of the National Library of Finland (NLF) has improved the approachability of cultural heritage materials for schools. By developing and introducing new authoring tools and processes, Finna Services has facilitated the national curation of cultural heritage material packages for educational purposes. These material packages are promoted in a newly created content area for schools, known as Finna Classroom, which is part of the broader Finna.fi search service. The concept of utilising curated material packages to enhance the approachability of cultural heritage materials has evolved over these five years, expanding the scope of material packages beyond just learning.

The initiative began after the discovery that teachers were unable to effectively use the rich and valuable materials available on Finna.fi. It became clear that teachers needed resources that could be easily aligned with the curriculum. In response, Finna Services started efforts to enable cultural heritage organisations to curate material packages from individual digitised items already published on Finna.fi.

For years, libraries, archives, and museums (LAM) in Finland had been expressing a general desire for shared tools to curate material packages from cultural heritage materials. Although this wish was common, no single organisation had taken responsibility for initiating the development project within the LAM sector. Within the Finna ecosystem, there was a clear work division between who was responsible for providing the shared discovery platform and for content, but it was unclear as to who would provide the shared content platform. This responsibility gap hindered progress. Human-centred design and co-creation methods played a crucial role in moving the project forward.

---

1. https://finna.fi

This case is interesting on multiple levels. At the most obvious level, it provides insights into the needs of teachers and the desires of cultural heritage organisations. From a LAM ecosystem management perspective, it is a success story of how the ecosystem innovatively developed a new service, requiring adjustments in roles and responsibilities.

In this article, we describe the case, outline how the work proceeded and the methods used, and share insights from the human-centred design work. We examine the case through the question, 'How did user-centred design and co-creation methods guide and facilitate collaboration in the national service and material provider network?'

Theoretical Background – Ecosystems and Realisation of Value Propositions

To discuss national collaboration in the Finna context, we need to consider ecosystem governance. Ron Adner (2017) introduced the concept of 'ecosystem-as-structure', which differs from traditional ecosystem definitions that focus on affiliations between organisations, such as the relationship between a platform owner and component providers or agreements between consortium leader and members. Instead, ecosystem-as-structure views ecosystems as configurations of necessary activities defined by a targeted value proposition. Adner (2017) emphasised the importance of considering the ecosystem when undertaking new activities that require new alignments and responsibilities among a set of partners. He also highlighted the need to identify the specific actions required to realise the value proposition.

Adner's (2017) theory raises several key points about aligning elements to achieve the value proposition. For instance, expectations for leader–follower roles within systems or sub-systems must align. If the leadership role is unclear, burdensome, risky, or contested, the system or sub-system might lack an actor taking the leadership. Additionally, expectations regarding structures and responsibilities must match, meaning everyone needs to understand their roles. Finally, the expectations for the value proposition itself must also align.

We encountered Adner's theory after this case in the LAM sector in Finland, but the theory strongly resonates with it. The desire to create a curating platform was evident in this case, but it was unclear who should lead the initiative. The leadership role could be burdensome, and developing the platform could be resource-intensive. Moreover,

expectations about what the tool should achieve likely varied significantly.

The value expectation for a public service is not straightforward. In commercial ecosystems, the value expectation typically involves generating enough profit or revenue for all involved parties, with the end customers ultimately providing the money. In public services, the profitability chain is more complex. Public services are funded by society, usually through public governance bodies such as ministries or municipalities, which expect these services to fulfil certain public values and obligations.

In Finland, the purposes of public organisations are typically defined by laws, which outline the reasons for their public funding. For instance, the purpose of the NLF to offer services to other libraries is defined by one law (Ministry of Justice, 2009), the purpose of museums by another (Ministry of Justice, 2019), and the purpose of public libraries by a third one (Ministry of Justice, 2016). Each organisation interprets these laws to fulfil its obligations. As an example of the funding, the Finna Services of the NLF are funded by the Ministry of Education and Culture, and offering materials through Finna services is free for organisations receiving their general funding from the same ministry and the usage of services is free for the end users.

Fuglsang and Rønning (2015) proposed examining public value through value spheres, simplified and modernised from the socio-economic spheres introduced by Weber (1958). These spheres provide five lenses to evaluate the potential value of service innovation: political (also includes fulfilling the purpose of the public organisation), economic, societal, aesthetic, and intellectual. In the context of cultural heritage, the Europeana Foundation (2023) has created the Europeana Impact Playbook to help cultural heritage organisations innovate impactful services. The Playbook introduces five strategic perspectives (environmental, social, operational, innovation, and economic) and four value lenses (existence, legacy, learning, and community) tailored for cultural heritage services i.e. representing very similar thinking but tailored specifically to cultural heritage. Additionally, it is increasingly accepted that public value materialises only when users actually use the services (Osborne & Strokosch, 2013).

When considering the alignment of value expectations within the Finna ecosystem, the value expectation must produce public value, particularly in the eyes of the financier. Organisations within the ecosystem need to

see that the new service helps them fulfil their purpose and obligations in their preferred manner. It must also meet end-user needs to ensure actual usage and for the value to materialise.

The production of public services often involves networks of organisations, and it is crucial to manage these networks (O'Flynn, 2007; Stoker, 2006). Studies have suggested that such networks of organisations should be included in innovation work through co-creation methods (Virtanen & Stenvall, 2014). Research has also proposed involving citizens through co-creation methods (Osborne & Strokosch, 2013; Osborne et al., 2013; Radnor et al., 2014).

Co-production can refer to a range of activities (Osborne & Strokosch, 2013). However, in the context of innovating digital services, participative co-production – empowering users to participate in the design of future services – is the most relevant. For this human-centred design, processes have provided a range of methodologies for decades. For instance, the principles of human-centred design processes are defined in ISO-9241-210 (International Organization for Standardization, 2019).

Materials Used to Sketch Timeline and Description of the Case

We realised that the work done on this case serves as an interesting example of how human-centred design and co-creation methods help to advance the Finna ecosystem only after the case was completed. Consequently, there was no initial decision to systematically document the case. However, the design and customer work naturally produced documentation that could be used as artefacts to reconstruct the timeline of events over the years.

For this paper, these documents were utilised to identify individual methods and work phases to construct the case. The artefacts were thoroughly reviewed. The identified work phases and design methods were then added to a comprehensive timeline. Moreover, the artefacts used to identify each phase and method were also documented on the timeline.

The author has worked as a user experience designer for Finna services during the years described in the case and is, therefore, familiar with the details.

Case

Background of Finna Services

Finna Services, managed by the NLF, plays a focal role among LAM organisations in Finland. Finna Services is uniquely positioned to address this challenge faced by LAM organisations. Finna is a shared interface utilised by Finnish LAM organisations, comprising the national search service Finna.fi and a platform service that enables these organisations to develop their own search websites. Furthermore, Finna Services has been operational for a decade and currently involves over 450 LAM organisations that contribute content to the platform. While the creation and maintenance of the platform are managed by the Finna team at the NLF, the content is provided by all participating organisations.

Finna Services caters to two main types of customers, namely LAM organisations, which act as content providers, and citizens, who are the end users of the services and LAM content. The role of LAM organisations is multifaceted; they not only act as customers but also form a consortium and steering group for the consortium to which Finna Services must report their actions and yearly plans.

The Finna Services harvests metadata of individual cultural heritage objects into a shared index from all participating LAM organisations. It offers a search interface for this metadata to end users, allowing them to discover any individual material. If the material contains a digital object link, the Finna platform retrieves the object in real time and displays it to the user. This capability already significantly enhances the discoverability and reusability of cultural heritage materials nationally. However, until now, it has not been possible for organisations to curate material sets from the individual materials available through Finna Services.

Using the definition of a software ecosystem by Manikas and Hansen (2013), the NLF and the network of content provider organisations of Finna Services can be seen as a software ecosystem. The Finna platform interconnects a set of actors and delivers a suite of collaboratively produced services, and each actor operates based on their own interests while fostering a symbiotic relationship through their interactions. The NLF also serves as a focal firm or orchestrator in the Finna ecosystem due to its role as the platform developer.

Stage 1: Creation of the Finna Classroom (2018–2019)

One of the target groups for Finna.fi is teachers. For years, the Finna team at the NLF has worked to raise awareness of the Finna.fi service among teachers, for example, by having an annual exhibition stand at the Educa, a Finnish event for services targeting teachers. By 2018, there were subtle signs that awareness of Finna.fi was already relatively extensive, but this awareness had not translated into actual usage. These signs raised questions as to whether cultural heritage materials were not as useful to teachers as the Finna team believed, or if there were issues with the service that prevented teachers from using it in practice.

To understand the root causes, the Finna team conducted user research with teachers, aiming to clarify two main points. First, they sought to determine whether teachers found cultural heritage materials useful as educational resources. This part of the study involved three teachers: a history teacher, a Finnish language teacher, and an art teacher.

If the teachers had not previously used Finna.fi (which was the case for two out of the three teachers), they were introduced to the service and its user interface (UI). They were then asked to try using materials from Finna.fi in their teaching and to keep a simple diary documenting their experience. No additional requirements, such as the extent to which they should use the materials, were imposed. Afterwards, all the teachers were interviewed about how they had used the materials in their teaching. One of the teachers had already used Finna.fi extensively; therefore, he was interviewed without any training or advice on documenting his user experience. The results confirmed that cultural heritage materials were, indeed, useful to teachers and offered many advantages over general search engines such as Google.

To understand what prevented new users from adopting Finna.fi, the team arranged three group interviews with ideation brainstorming sessions involving different groups of teachers (primary school teachers, Finnish language teachers, and history teachers). The results highlighted that the vast amount of material available on Finna.fi was a double-edged sword. While this volume of material was necessary to cater to different kinds of users, it made it difficult for new users to grasp what was specifically available to them. The everyday reality in schools is that teachers are extremely busy and have limited time to prepare lessons. Spending time on extensive research is challenging, and they rarely end up doing it. Teachers expressed a desire for ready-made, curated material packages connected to curriculum topics, implying

a connection to school subjects, specific learning objectives, and age group appropriateness.

The teachers' feedback indicated a direction which the Finna team could not follow independently. To jointly innovate with content-providing LAM organisations based on these results, the Finna team arranged an open co-creation workshop for Finna's customer organisations. The early concept idea of the Finna Classroom emerged from this workshop. The workshop also clearly showed that LAM organisations were willing to curate material packages for schools if Finna provided the tools for creating and publishing them.

After processing the workshop results, the Finna team proposed piloting the idea with a small number of organisations using existing tools (the favourite-list feature of the Finna platform and content pages), even though these tools were not ideal. For instance, the favourite-list feature was created for end users to create their own lists using normal user accounts; it was not meant for publishing semi-permanent content. The accounts and lists created using the feature expired if not used for a certain period, and the content was not searchable through normal content search. Moreover, attaching the content created with the feature into Finna.fi content page and publishing that page required Finna.fi admin work; therefore, organisations could not publish their content by themselves. Furthermore, producing language versions (Finnish and Swedish) required creating the versions as completely new material packages. The pilot followed the principles of agile development: seek success or fail fast, start with a minimum viable product (MVP), and see if people use it (Beyer et al., 2004).

Seven LAM organisations participated in the pilot and produced the first material packages. Since LAM organisations are independently responsible for their content work, Finna cannot mandate specific work practices. However, the Finna team used the pilot as an opportunity to study and gain experience in user-centred content design practices. The team hired a history teacher for the duration of the pilot to produce some example material packages and be available to assist any of the pilot organisations. This teacher also created ready-made pedagogical utilisation ideas for their packages if organisations did not create them themselves. This pilot phase helped the Finna team formulate general instructions and recommendations for organisations when the production of material packages was opened to any LAM organisation within the Finna consortium. This phase was documented in detail and has been

described and analysed further in a separate publication by Peltonen and Nieminen (2023).

At the end of 2019, the first version of the Finna Classroom was published as a content area under Finna.fi with circa 20 Finnish packages and their Swedish equivalents. Since then, the number of new packages created by LAM organisations steadily increased to approximately eight new Finnish packages with their Swedish equivalents per year, until the opportunity to publish new packages was closed in 2023 in anticipation of a new material package tool. At the end of 2023, there were approximately 53 Finnish material packages and their Swedish equivalents, if materials were suitable for Swedish usage e.g. they were pictures and not Finnish text based artefacts like letters.[2]

Table 1 summarises the human-centred design and co-creation methods used in Stage 1, the parties responsible for executing methods and those only involved as participants, the main outcomes of the stage, and the artefacts used to construct the timeline for the stage.

Table 1: Summary of used human-centred design and co-creation methods and documentation existing from the Creation of the Finna Classroom stage.

Stage: Creation of the Finna Classroom (2018–2019)	
Human-Centred Design or Co-Creation Methods Used in This Stage	**Existing Artefacts from the Stage**
User research[Primary F, involved U] • Simple diary study • Interviews • Group interviews **Co-creation workshop with material provider organisations**[Primary F, Involved O] **Pilot (MVP) creation**	• **Draft Report on User Research Results**: Preliminary report detailing the findings from the user research • **User Research Results Presentation**: Presentation summarising the results of the user research • **Workshop Results Report**:

---

2. Source: Finna's web statistics system Matomo, where packages show as web pages. If some of the packages did not have any traffic during 2023, they do not show in statistics; therefore, the number is an approximation.

- UI design[Primary F, Involved O, U]
- Pilot content creation[Primary O, involved U, F]

  - Kick-off meetings with each of the pilot organisations and the teacher, the meetings acted as an opportunity for organisations to interview the teacher related to needs at school
  - Content curation and additional content creation (heading, ingress, extra notes) by the pilot organisations (including the possibility to contact the teacher if needed)
  - Pedagogical utilisation ideas creation (some organisations did it themselves as part of other content creation work, whereas for others, a teacher created them)
  - Review of the material packages by the teacher

- **MVP implementation of the Finna Classroom**[Primary F]

Comprehensive report on the outcomes of the workshop
- **Pilot Promotion Presentation**: Presentation slides created to advertise the pilot to Finna organisations
- **Journal Article on Content Creation Phase**: Detailed journal article describing the activities and processes involved in the content creation phase of the pilot
- **Interview Transcripts**: Transcriptions of interviews with pilot participants that were used as material for the journal article
- **Background Presentation from 2019**: Presentation slides from 2019 that describe the background of Finna Classroom
- **Web Analytics Data**: Web analytics data for Finna Classroom web pages, available since October 2019

Parties involved:

- F = The platform developer organisation (Finna team of the NLF)
- O = Content provider organisation(s)
- U = End user representative(s)

Outcomes:

- The decision to address the problem within the Finna ecosystem
- The Finna team at NLF assuming the orchestrator role in solving the problem
- The LAM organisations in the Finna ecosystem taking the responsibility of producing material packages to solve the problem
- Recommendations for LAM organisations to adopt a human-centred content creation process
- Publication of the MVP of Finna Classroom[3]

Stage 2: Running the Initial Finna Classroom (2020–2022)

Between 2020 and 2022, the Finna Classroom experienced growth and increased popularity. The COVID-19 pandemic further spurred teachers' interest in using digital materials in education and prompted LAM organisations to seek digital methods to offer their services. The material packages continued to be created using the same tools (favourite lists on the Finna platform and content pages) as in the pilot phase. The favourite lists were originally a feature of the VuFind platform (an open software platform used by Finna Services), designed for end-users to create their own lists of favourite materials for private or semi-private use. These lists already included features that allowed them to be made public enough to be shareable via a link or through automated methods such as RSS feeds. Users could also add short notes to items on their favourite lists. Before this innovation, site administrators were already using these lists to create shortlists for image carousel components displayed on the front page or content pages.

In the Finna Classroom usage, representatives from organisations who wanted to create a material package would compile a favourite list with the materials in the correct order and add headings, introductions, and descriptions according to specific guidelines. For more complex packages with sub-content, multiple lists were created. A Finna team member with admin rights would then manually create a webpage under Finna.fi, where the list and its additional content would be added. The

---

3. Current and more developed version of Finna Classroom: https://finna.fi/Content/luokkahuone (only available in Finnish and Swedish).

Finna admin would also manually add the new page to the Finna Classroom front page, which listed all available material packages.

Finna Classroom had a policy that all material packages should be offered in both official languages (Finnish and Swedish) unless the material required a specific language for proper use. In practice, each language version was produced as a new list and new content page, with new links to the language version from the front page of the Finna Classroom. This practice led to a multiplication of manually created and updated web pages, and the increased administrative workload began to create a bottleneck.

To make the timing of admin work for adding packages to the Finna Classroom more predictable, the Finna team introduced periods during which new organisations could join and offer packages. These periods began with a common kick-off event to remind organisations of the design guidelines and ended with a common review offering also quality control opportunities.

Since the favourite lists were originally intended for consumer use, they had expiration dates and would expire if the account owner did not use their account for a certain period. As a result, lists expired and were lost in some instances.

Meanwhile, in Finland, the Ministry of Education and Culture created a Library of Open Educational Materials, which was integrated into Finna.fi. The Finna Classroom began to showcase these materials as well.

During 2021 and 2022, Finna conducted a usability test focusing on the Finna Classroom. This test identified many small improvements and one major request: teachers wanted the offerings to be showcased more based on their school subjects and were equally interested in material packages and other open educational materials. This finding strongly suggested the need for a technical solution that would allow material packages to be searchable and filterable.

Table 2 summarises the human-centred design and co-creation methods used in Stage 2, the parties responsible for executing methods and those only involved as participants, the main outcomes of the stage, and the artefacts used to construct the timeline for the stage.

Table 2: Summary of used human-centred design and co-creation methods and documentation from the Running the Initial Finna Classroom stage.

Stage: Running the Initial Finna Classroom (2020–2022)

Human-Centred Design or Co-Creation Methods Used in This Stage	Existing Artefacts from the Stage
Usability testing of Finna Classroom 2022[Primary F, involved U] **Running MVP and learning iteratively from it**[Primary F, involved O, U]	• **Usability Testing Report**: Usability testing report for Finna Classroom from the year 2022 • **Web Analytics Statistics**: Web analytics data showing page views for material package content pages, including the dates when the pages were created and page view counts • **Presentation Slide Sets**: Four sets of presentation slides for organisations providing material packages to Finna Classroom, from September 2021, March and September 2022, and from the year 2023. These slides include historical information, instructions, and current topics. • **New Tool Presentation Slide Set**: Presentation slides detailing the new tool and the reasons for its necessity, prepared for the steering group of Finna Services in Spring 2023

Parties involved:

- F = The platform developer organisation (Finna team of the NLF)
- O = Content provider organisation(s)

- U = End user representative(s)

Outcomes:

- Proof that organisations were willing to create material packages if they were offered tools and a place to publish (even if the process is slightly sub-optimal)
- Proof that material packages are used
- Understanding that current practices will not allow broadening the concept much further, but that better tools are required

Stage 3: Confirming Further Needs and Intentions of the Content-Providing LAM Organisations and Broadening the Concept of Finna.fi (2020)

In 2020, the possibility of curating digital material packages for educational purposes through the new Finna Classroom gathered interest from museums and archives. There were also informal indications that these institutions desired similar opportunities to curate digital material packages for other target groups and purposes.

At the same time, the Finna team was updating the concept of Finna.fi, and this topic needed to be addressed as part of that work. Previously, the concept had been purely a search service; the introduction of the Finna Classroom had already expanded this scope, and there were signs indicating a desire to move even further in this direction.

To gather opinions and wishes from the content-providing LAM organisations related to Finna.fi, the Finna team conducted a questionnaire study. One objective of this study was to determine how widespread the interest was in curating material packages for different target groups. According to the questionnaire results, almost half the responding organisations were interested in curating education-related material packages. Four or five target user groups emerged from the data (depending on whether hobbyists and entertainment seekers are counted as one or two groups): 1) elementary and high school students, 2) higher education students, 3) researchers, and 4) hobbyists and self-learners.

Additionally, 40% of the free-text respondents expressed a desire to create material packages for lighter purposes such as entertainment.

The work related to the Finna Classroom had already provided insights into the desire to curate materials for elementary and high school education. The questionnaire did not provide sufficient information for the other groups, necessitating deeper dialogue between the Finna team and the content-providing organisations. Finna arranged two open co-creation workshops with Finna organisations to clarify what curating would entail for higher education and researchers, as well as for hobbyists, self-learners, and entertainment purposes.

This information was processed as part of the Finna.fi concept renewal work. In the updated concept outlines, Finna.fi will feature content areas with curated materials for all three main target groups: education (the Finna Classroom), researchers (including students seeking topics for master's theses), and hobbyists and free-time users. During the concept renewal work, the Finna team recognised the need for a fourth content page. The number of Finnish digital open-access research publications was growing on Finna.fi, and the new concept needed to highlight these more prominently. The idea of a content page promoting such materials to the general public seemed logical. These content areas would be developed gradually, eventually providing logical starting points for new users from the largest target groups of Finna.fi.

Additionally, the workshops revealed that organisations wished for better tools to enable more professional content management. Specifically, organisations desired tools in which material packages did not expire accidentally, the creation of language versions was less cumbersome, and material packages were findable through the Finna search index alongside other materials. Furthermore, organisations wanted tools that would allow the use of the same materials across multiple Finna-based search sites. There was also a strong desire for features that would enable crowdsourcing activities.

Table 3 summarises the human-centred design and co-creation methods used in Stage 3, the parties responsible for executing methods and those only involved as participants, the main outcomes of the stage, and the artefacts used to construct the timeline for the stage.

Table 3: Summary of used human-centred design and co-creation methods and documentation existing from the Confirming Further Needs and Will of the Content Providing LAM Organisations and Broadening the Concept of Finna.fi stage.

Stage: Confirming further needs and will of the content providing LAM organisations and broadening the concept of Finna.fi (2020)

Human-Centred Design or Co-Creation Methods Used in This Stage	Existing Artefacts from the Stage
Research on needs of the content providing LAM organisations[Primary F, Involved O, U] • Questionnaire study • Few end user interviews • Two co-creation workshops **Finna's internal conceptualisation work using the inputs from the research**[Primary F]	• **Questionnaire Study Report**: Report detailing the results of the questionnaire study • **Workshop Results Reports**: Reports summarising the outcomes of the two workshops • **PDF Exports of Workshop Templates**: PDF exports of digital templates and post-it notes from a workshop conducted as part of Finna's internal work • **Presentation Slides Future of the Finna.fi**: Presentation slides summarising the future plans for the Finna.fi from the year 2022

Parties involved:

- F = The platform developer organisation (Finna team of the NLF)
- O = Content provider organisation(s)
- U = End user representative(s)

Outcomes:

- Updated concept for Finna.fi approved by the management of Finna and the steering group of the Finna

Stage 4: Committing Resources to Develop and Run Renewed Finna.fi (2021–2024)

The revised concept for Finna.fi, in addition to the Finna Classroom, outlined three other content areas to be developed over time. The idea of promoting research publications to the general public appeared to be the most achievable one. The minimum viable solution for this type of content did not require creating material packages per se; rather, it involved promoting interesting materials visibly and, thereby, guiding users to discover them. Consequently, a page and processes for organisations to submit proposals for highlighting content on this page were established in 2021 using existing tools.

Simultaneously, operational learnings were gathered from the Finna Classroom-related work. It became evident that if the Finna team were to take the next steps and create the possibility to curate material packages for other target groups, and if the concept succeeded, a bottleneck in Finna's processes would become a serious problem.

The year 2021 was pivotal as Finna had to decide whether to really commit to the concept. Finna needed better tools to advance the updated concept. Moreover, by this time, Finna had accumulated data supporting the decision. The success of the Finna Classroom demonstrated that our organisations were interested in providing these types of curated material packages, and the positive response from teachers indicated that the concept was viable and had the potential for further growth. Finna had both quantitative and qualitative data showing that content provider organisations had a strong interest in curating material packages for other purposes as well. Moreover, Finna had a clear roadmap for gradually broadening the inclusion of this type of content on Finna.fi in a way that would consistently support the concept and success of Finna.fi.

Technical experts also brainstormed possible solutions. Drupal, an open-source content management tool, appeared to be adaptable to our purposes without the need to build everything from scratch, although it still required a significant amount of development on Finna's part.

At this point, Finna's management felt confident enough to proceed and plan the work for the following year. The actual development began at the end of 2022 and continued over 2023. As part of the development, the tool was usability tested with pilot organisations. Originally, the plan was to have the first version of the tool ready by the end of 2023. Consequently, the Finna team announced that no new packages would

be accepted into the Finna Classroom during 2023 until the new tool was operational. The existing packages were converted into the new format around the end of the year, but the tool was only ready for organisations to create new packages in May 2024. Moreover, the Finna Classroom page designs were renewed during spring 2024 to better utilise new features from material packages created with the new tool, and the new designs were usability tested with teachers. The renewed Finna Classroom was published in May 2024.

Towards the end of 2023, an opportunity arose to redirect a short-term piece of funding originally granted for another purpose to a new purpose, with the limitation that it should serve researchers and support scientific endeavours. The Finna team utilised the funding for broadening the purpose of the new tool to create material packages for researchers and master's students working on their theses and developing a new content area for this type of content.

Table 4 summarises the human-centred design and co-creation methods used in Stage 4, the parties responsible for executing methods and those only involved as participants, the main outcomes of the stage, and the artefacts used to construct the timeline for the stage.

Table 4: Summary of used human-centred design and co-creation methods and documentation existing from the Committing Resources to Develop and Run Renewed Finna.fi stage.

Stage: Committing Resources to Develop and Run Renewed Finna.fi (2021–2024)	
Human-Centred Design or Co-Creation Methods Used in This Stage	**Existing Artefacts from the Stage**
Creation of content page Shortcut to researched information[Primary F, involved O, U] • UI design, initial content creation and implementation • Usability test for the page **Creation of the material package tool**[Primary F, involved O]	• **Usability Test Report**: Usability test report for the page 'Shortcut to Researched Information' from the year 2023 • **Presentation Slides on New Tool**: Presentation slides outlining the new tool and the reasons for its necessity, prepared for the

- UI design and implementation
- Testing the tool with pilot organisations?

Renewing UI design of Finna Classroom better to utilise new features of the material packages produced with the new tool[Primary F, involved U]

- UI design and implementation
- Usability testing

steering group of Finna Services in Spring 2023

- **Finna's Vision Presentation Slides**: Presentation slides from the Finna team for the steering group of Finna Services about Finna's vision, from May 2023
- **Internal Slide Sets**: Two internal slide sets covering topics that need discussion and decisions to be made
- **Presentation Slide Set for Material Package Providers**: Presentation slides for organisations providing material packages to the Finna Classroom in 2023, including plans and a call for pilot organisations to test the tool
- **Usability Test Report**: Usability test report for the new tool from November 2023
- **Usability Test Report**: Usability test report for the renewed Finna Classroom from Spring 2024
- **Funding Application Text**: Application text for funding to broaden the usage of the tool as a PDF document from November 2023
- **Finna Team's Work Plan Presentation Slide Set**: Presentation slides from the Finna team for the steering group of Finna Services, detailing the work plan for 2024

- **Finna Team's Strategy Administration Plan Presentation Slide Set**: Presentation slides from the Finna team on how they plan to administer Finna's strategy in practice during the period 2025–2028

Parties involved:

- F = The platform developer organisation (Finna team of the NLF)
- O = Content provider organisation(s)
- U = End user representative(s)

Outcomes:

- Content page shortcut to researched information under Finna.fi[4]
- New material package curation tool (use limited to curating material packages for education purposes)
- Renewed designs for the Finna Classroom
- Funding to broaden the usage of the new tool for promoting materials for researchers and students looking for research topics for their master's theses
- Plans to broaden the usage of the new material packages tool for other target groups included in the high-level work plan of Finna Services for the period 2025–2028

Discussion

In the previous section, we described the progression of the case between the years 2018 and 2024. In this section, we reflect on the case through the question, 'How did user-centred design and co-creation methods guide and facilitate collaboration in the national service and material provider network?' The case is a success story, but this success

4. https://finna.fi/Content/tutkittu-tieto

was not self-evident. It required systematic effort, and without such dedicated work, the project could have stalled at numerous points.

Human-Centred Design Practises Ensured That the Intended Public Value Realised and End Users Utilised the Service

The original concept of Finna.fi, designed primarily as a straightforward search service for LAM materials, also aimed to target teachers. However, the intended value for teachers was not realised because the service was not sufficiently user-friendly for new users. Initial user research, which informed the conceptualisation and periodic usability testing of the service, contributed to refining the concept to a point where teachers began to use the service. The involvement of citizens was beneficial, as suggested by several scholars (Osborne & Strokosch, 2013; Osborne et al., 2013; Radnor et al., 2014).

User Research Refined the Scope to a Solvable Size Within the Limit of Finna Services

The management at the NLF might have initially perceived the task of enabling digital curation as a broad challenge within the LAM sector. They might have concluded that it was beyond Finna's scope of responsibility to address this issue, suggesting, instead, that the initiative should come from content owners. Drawing on Adner's (2017) insights, the problem area was such that the existing alignments within the Finna ecosystem did not encompass it. It was unclear who should assume the leadership role, and the role itself appeared potentially burdensome.

While the general problem was, indeed, a broader challenge, initial user research enabled Finna to narrow the problem scope. This refinement transformed it from a large-scale issue within the LAM sector to a specific problem that could be addressed within the context of Finna.fi. This clarification allowed NLF, as the platform owner, to recognise the problem as part of the existing ecosystem and accept the leadership role, with other participants following suit. Using Adner's (2017) terminology, this alignment of role expectations was crucial for addressing this particular problem.

The research results also allowed the Finna team to direct the co-creation workshop involving organisations towards solving this specific, narrower problem within Finna.fi, rather than attempting to tackle the larger challenge within the LAM sector. This focus enabled the initial

proposal for a minimum viable solution to address this specific issue, making the solution less technically demanding and, thus, requiring less development effort.

In the co-creation workshop, a sufficient number of organisations confirmed that they would be willing to commit to producing material packages for schools if Finna provided the necessary tools and a platform for publication. The workshop helped the Finna team to leverage the organisations' power for the concept proposal.

This approach aligns with the ideas proposed by Virtanen and Stenvall (2014), who have suggested that involving a network of organisations in innovation work is beneficial when producing services in networked environments. In line with Adner's (2017) terminology, once more, the process aligned value expectations; clarified NLF's role; and confirmed that organisations would be willing to participate; even if only this specific problem was addressed.

With a sufficiently narrow scope, adequately light proposed minimum solution, sufficient backing for the proposal, and clear role expectations, it was possible to secure permission for the pilot within NLF.

Co-operational Pilot Produced Objects for Communication

Having a pilot project significantly enhanced communication on multiple levels. First, it functioned traditionally within design processes, producing boundary objects for design purposes and aiding in the development of final designs for both the UI and related processes.

Boundary objects are sets of arrangements that are simultaneously material and processual, residing between communities of practice. By collaborating on these objects, communities develop a shared understanding (Star, 2010).

In digital service production, these objects typically are, for instance, UI wireframes. In our case, the UI design produced wireframes that enabled the pilot content producers and the participating teacher to understand the concept idea. The pilot content, in turn, helped to mediate the perspectives of the content provider organisations. The work with pilot material packages facilitated meaningful cooperation in honing the designs. Without real material package data, completing the UI designs would not have been feasible. However, it was convenient to iterate package designs with only a handful of organisations. The involvement of pilot organisations in producing pilot content facilitated efficient

communication between designers and content producers. This involvement allowed the Finna team to determine the necessary instructions for organisations with a reasonable number of participants.

Second, the published pilot site and its content served as a communication object in itself, slowly turning from a boundary item to an infrastructure. It enabled the usability testing of the UI concept with end users and further iteration of designs. Moreover, it clarified the expectations for organisations wishing to create educational material packages. This clarity generated a steady and growing interest in producing such packages. Furthermore, it enabled organisations requiring additional funding to apply for it. Many organisations, for instance, began including the intention to create a material package for Finna Classroom in their applications for digitisation funding applications. According to Adner's (2017) theory, the pilot helped to communicate both role expectations (what organisations need to do to participate) and value expectations.

Third, Finna Classroom concretely demonstrated the capabilities of the current tools within the Finna ecosystem. This clarity made it easier for organisations to realise that similar projects might be possible for other target users and articulate their wishes for the Finna ecosystem in more detail. Without this development, discussions would likely have remained at a more general level, where these requirements would have been considered as broad needs within the LAM sector. If the discussion had remained at such a general level, the NLF might not have acknowledged the problem to be solved within Finna ecosystem nor accepted the leadership role. Using Adner's (2017) notion, discussion would have stayed in an area where the role expectations of the existing ecosystem do not apply.

Running Minimum Viable Solution Produced Concrete Customer Data

Implementing the minimum viable solution yielded concrete data on multiple levels, despite it not being the optimal solution. The experience gained from operating the Finna Classroom provided a clear understanding of the tools required to further enable curation.

Additionally, the data indicated that the chosen conceptual solution was correct, even though the tools were not yet optimal. Organisations expressed interest in producing more material packages, and teachers

appreciated the Finna Classroom. Furthermore, the data showed that these packages were being utilised.

Essentially, the MVP generated data identifying the next most important issues to address, which aligned with Agile development principles (Beyer et al., 2004). This data was crucial in forming decisions on how to proceed.

Customer Research Provided Facts and Rational for the Updated Finna.fi Concept Proposal

The customer research, including the questionnaire and workshops with content provider organisations, yielded data that became the driving force behind the updated Finna.fi concept proposal. Based on these results, it was straightforward to propose a new direction for Finna.fi to the steering group of Finna Services, making it easier for the steering group to approve the proposal.

This process once again validated Virtanen and Stenvall's (2014) assertion about the benefits of involving the network of organisations in innovation work. Moreover, when compared to Adner's (2017) insights, it is evident that, as in the case of the initial user research and co-creation with organisations, this involvement helped to clarify expectations regarding roles and value expectations. Without this clarification, decision-making would have been considerably more challenging.

Human-Centred Design and Co-Creation Activities Delivered Data for a Supplemental Funding Application

A robust long-term concept supported by data enabled the creation of a compelling funding application when an opportunity arose at short notice. The limited time available for preparing the application would have made it nearly impossible without a pre-existing, well-developed concept.

Although following may seem self-evident, when considered in the context of Adner's (2017) concept of ecosystems as structures and its implications, it suggests that for challenging problems not covered by an existing ecosystem, user research and co-creation with key ecosystem stakeholders can help develop strong, fundable concepts. However, parties must allocate time for this preparatory work in advance.

Reliability, Limitations, and Future Work

The documentation of the case was not planned in advance but was undertaken retrospectively. The artefacts create a timeline illustrating the various phases of the work and the user-centred design and co-creation methods employed. However, they do not provide insights into the thoughts of the individuals involved in the case. The author was engaged with Finna Services during the case, working with the case more closely during the conceptual phases and less so during the actual website and tool development. The author's familiarity with the case is beneficial in terms of her deep understanding of the artefacts and their implications, but it may have also influenced the objective interpretation of the work.

The case has been described at a general level, and the outcomes have been compared to Adner's (2017) concept of an ecosystem as a structure for ecosystem strategy. While the author has highlighted the most obvious implications per working phase, a systematic reflection on the specific roles each method played in the work is lacking. The study suggests that human-centred and co-creation activities have a dual role in the processes. In addition to their function as design activities, their importance should also be considered from an ecosystem alignment guidance perspective. A more systematic reflection on the methods used, involving a broader group of people who participated in the case, will be valuable. Furthermore, it will be interesting to conduct similar reflections on other cases within the Finna ecosystem, as well as in other ecosystems.

Conclusion

In this paper, we described how Finna Services has been fostering national collaboration by using human-centred design and co-creation methods to enable the curation of material packages for schools. We also explored how, at the same time, Finna Services has started to solve one of the nationally shared overarching desires to have curation tools for cultural heritage materials. The case detailed the project's progression from 2018 to 2024 and outlined its stages, the human-centred design and co-creation methods employed, and insights gained from user research studies and workshops with various organisations. We addressed the question, 'How did user-centred design and co-creation methods guide and facilitate collaboration in the national service and material provider network?'

The case demonstrated how human-centred design and co-creation methods can serve as strategic actions. These methods helped align role expectations and value expectations within the ecosystem, particularly in challenging scenarios. This finding aligns with Adner's (2017) assertion on the importance of planning such activities as part of an ecosystem strategy, although practical guidance on specific activities has been lacking until now. For the question we raised, the key findings were as follows:

- Human-centred design practises ensured that the intended public value was realised and end users utilised the service.
- User research refined the scope to a solvable size within the limits of Finna Services.
- The co-operational pilot produced objects for communication.
- Running the minimum viable solution produced concrete customer data.
- Customer research provided the facts and rationale for the updated Finna.fi concept proposal.
- Human-centred design and co-creation activities delivered data for a supplemental funding application.

The case also described insights from user research and workshops that indicated a significant need in Finland, particularly in the educational context, for ready-made cultural heritage material packages. These packages facilitated the integration of complementary materials into school curricula. Additionally, Finnish cultural heritage organisations showed a strong willingness to provide curated material packages for various target groups through a national service, provided the necessary tools were available. On a practical level, regarding the topic of including end users and organisations in the design process, this case provided a good example of applying methods in a LAM digital service development project. The findings suggest that ecosystem leader organisations should focus on utilising user-centred design and co-creation methods. Organisations will benefit from recognising their potential as powerful tools for guiding digital ecosystems forward.

References

Adner, R. (2017). Ecosystem as structure: An actionable construct for strategy. *Journal of Management, 43*(1), 39-58. https://doi.org/10.1177/0149206316678451

Beyer, H., Holtzblatt, K., & Baker, L. (2004). An agile customer-centered method: Rapid contextual design. In C. Zannier, H. Erdogmus, & L. Lindstrom (Eds.), *Extreme programming and agile methods – XP/agile universe 2004* (pp. 50-59). Springer. https://doi.org/10.1007/978-3-540-27777-4_6

Europeana. (2023). Europeana impact playbook. Retrieved September 3, 2024, from https://europeana.atlassian.net/wiki/spaces/CB/overview?homepageId=2256699653

Fuglsang, L., & Rønning, R. (2015). On innovation patterns and value-tensions in public services. *The Service Industries Journal*, *35*(9), 467-482. https://doi.org/10.1080/02642069.2015.1042971

International Organization for Standardization. (2019). *Ergonomics of human-system interaction – Part 210: Human-centered design for interactive systems* (ISO Standard No. 9241-210:2019). https://www.iso.org/standard/77520.html

Manikas, K., & Hansen, K. M. (2013). Software ecosystems – A systematic literature review. *The Journal of Systems and Software*, *86*(5), 1294-1306. https://doi.org/10.1016/j.jss.2012.12.026

Ministry of Justice. (2009). *Yliopistolaki* [University law]. https://www.finlex.fi/fi/lainsaadanto/saadoskokoelma/2009/558

Ministry of Justice. (2016). *Laki yleisistä kirjastoista* [Law about public libraries]. https://www.finlex.fi/fi/laki/ajantasa/2016/20161492

Ministry of Justice. (2019). *Museolaki* [Museum law]. https://www.finlex.fi/fi/laki/alkup/2019/20190314

O'Flynn, J. (2007). From new public management to public value: Paradigmatic change and managerial implications. *Australian Journal of Public Administration*, *66*(3), 353-366. https://doi.org/10.1111/j.1467-8500.2007.00545.x

Osborne, S. P., Radnor, Z., & Nasi, G. (2013). A new theory for public service management? Toward a (public) service-dominant approach. *The American Review of Public Administration*, *43*(2), 135-158. https://doi.org/10.1177/0275074012466935

Osborne, S. P., & Strokosch, K. (2013). It takes two to tango? Understanding the co-production of public services by integrating the services management and public administration perspectives. *British*

Journal of Management, *24*(S1), S31-S47. https://doi.org/10.1111/1467-8551.12010

Peltonen, R., & Nieminen, M. (2023). Creating digital LAM content for schools: Modelling user involvement in multi-organisational context. In D. H. Goh, SJ. Chen, & S. Tuarob (Eds.), *Leveraging generative intelligence in digital libraries: Towards human-machine collaboration. ICADL 2023* (pp. 46-61). Springer. https://doi.org/10.1007/978-981-99-8088-8_4

Radnor, Z., Osborne, S. P., Kinder, T., & Mutton, J. (2014). Operationalizing co-production in public services delivery: The contribution of service blueprinting. *Public Management Review, 16*(3), 402-423. https://doi.org/10.1080/14719037.2013.848923

Star, S. L. (2010). This is not a boundary object: Reflections on the origin of a concept. *Science, Technology, & Human Values*, *35*(5), 601-617. https://doi.org/10.1177/0162243910377624

Stoker, G. (2006). Public value management: A new narrative for networked governance? *The American Review of Public Administratio*n, *36*(1), 41-57. https://doi.org/10.1177/0275074005282583

Virtanen, P., & Stenvall, J. (2014). The evolution of public services from co-production to cocreation and beyond New Public Management's unfinished trajectory? *International Journal of Leadership in Public Services*, *10*(2), 91-107. https://doi.org/10.1108/IJLPS-03-2014-0002

Weber, M. (1958). Religious rejections of the world and their directions. In H. H. Gerth & C. W. Mills (Eds.), *From Max Weber: Essays in sociology* (pp. 323-359). Oxford University Press.

Abstract

This paper describes the case of how Finna Services, a Finnish national search service for library and cultural heritage materials, has improved the approachability of cultural heritage materials by enabling the production of curated material packages for education purposes. First, the case addresses the recognised needs of teachers for material packages that align with the curriculum and the desires of Finnish cultural heritage organisations to provide them. Second, the case explores the question: 'How did user-centred design and co-creation methods guide and

facilitate collaboration in the national service and material provider network?' The case demonstrates how some design and co-creation methods serve an additional function as activities that help the organisations clarify roles and value expectations within the ecosystem, thereby successfully realigning the ecosystem to take on the responsibilities needed for the implementation of the new service.

Keywords

Collaboration; Human-centred design; Co-creation; Finna; National LAM infrastructure; Software ecosystems; Ecosystem alignment

Digital Revival of Heritage: Elevating Caribbean Cricket Through Technology and Policy

Junior Browne

The University of the West Indies

It has often been said that the two true institutions of Caribbean/West Indian unity are the West Indies cricket team and The University of the West Indies (The UWI). These two institutions have not only stood the test of time but have both served as beacons and examples for others to follow. The UWI is the principal regional tertiary institution in the English-speaking Caribbean, distinguished by its mandate to serve as a catalyst for intellectual leadership, social cohesion, and sustainable development across a geographically and culturally diverse archipelago. Founded in 1948, The UWI has expanded from its original campus in Mona, Jamaica, to a federated university comprising campuses at Cave Hill (Barbados), St. Augustine (Trinidad and Tobago), Five Islands (Antigua and Barbuda), and the Global Campus, which provides multi-modal access to learners across more remote and underserved locations. In addition to the campuses, The UWI has also established 10 global centres across North America, Latin America, Europe, Africa and Asia and currently services over 50,000 students. The UWI's institutional architecture reflects its unique regional mission, functioning as a space for regional collaboration, research harmonisation, and policy discourse aimed at addressing the shared developmental challenges of Caribbean societies.

As a globally ranked institution, which attained its highest ranking in 2022 then placed among the top 1.5% of universities worldwide by Times Higher Education, The UWI maintains a strategic focus on academic excellence, regional integration, and the cultivation of Caribbean epistemologies. It plays a foundational role in preserving the region's cultural heritage through its libraries, museums, and specialised research centres, including those dedicated to law, governance, health, climate change, and the creative arts. Moreover, The UWI's scholarly ecosystem fosters a dynamic interface between knowledge production and cultural preservation, positioning it as an essential institution in advancing a distinctly Caribbean intellectual and cultural identity in the 21st century.

The UWI plays a pivotal role in preserving and promoting Caribbean heritage. As the premier regional institution for higher education and research, The UWI houses critical repositories of Caribbean cultural memory across its campuses. In this particular case it should be noted that the Cave Hill Campus in Barbados is home to the CLR James Cricket Research Centre — an institution that serves as a vital custodian of the region's cricketing heritage.[1] The UWI's commitment to digitisation and research accessibility aligns with its broader mandate to foster intellectual development and public engagement throughout the Caribbean.

In addition to supporting scholarly output, The UWI's infrastructure and academic networks provide a critical platform for building sustainable partnerships and advancing digital humanities initiatives across the region. Its existing collaborations with heritage institutions, policy bodies, and international organisations position The UWI as a hub for coordinated action in the digital preservation and valorisation of unique cultural assets.

West Indies Cricket – A Cornerstone of Cultural Identity and History

Cricket in the West Indies emerged during the colonial period as a sport introduced by the British but was gradually appropriated by Caribbean people as a means of cultural expression, resistance, and regional solidarity. Initially accessible only to the colonial elite, cricket became a vehicle for social mobility and nationalist sentiment in the 20th century, particularly as local players began to challenge and surpass their imperial counterparts. Beckles (1998, p. xiv) in his introduction, argues that if the West according to C.L.R. James, 'was invented in the space now called the Caribbean, then what its inhabitants have done with cricket within western discourse, should speak to its social history as modernity in action.' By the mid-20th century, the sport had evolved into a unifying force across the linguistically and geographically diverse Caribbean islands, symbolising excellence and self-determination.

The West Indies cricket team, a composite side representing multiple sovereign nations and territories, has been one of the most successful

---

1. CLR James Cricket Research Centre, https://www.cavehill.uwi.edu/cricketresearchcentre

and culturally iconic teams in the history of international cricket. The team's golden era spanned the 1970s to the early 1990s, during which the West Indies were the dominant force in world cricket. Most notably, they won the inaugural Cricket World Cup in 1975 and successfully defended their title in 1979. They reached the final again in 1983, narrowly losing to India. In 2016, the West Indies won the ICC World Twenty20 championship, securing a third world title in the shorter format of the game. Between 1980 and 1995, the team went unbeaten in a Test series for fifteen consecutive years—a record that remains unmatched in the modern era.

This period of dominance, led by players such as Clive Lloyd (1944-), who captained the team during this period, Viv Richards (1952-), Michael Holding (1954-), and Malcolm Marshall (1958-1999), was not merely a sporting achievement but a powerful statement of black excellence and regional unity. Their success on the international stage helped reshape global perceptions of the Caribbean and inspired pride and confidence among Caribbean people, both at home and in the diaspora.

Cricket has long served as a powerful symbol of resistance, pride, and unity in the Caribbean. More than just a sport, it is woven into the very fabric of the region's identity. From the colonial era through to post-independence, West Indies cricket has reflected struggles for self-determination and excellence on a global stage. Legendary figures such as Sir Garfield Sobers, Sir Frank Worrell, and Brian Lara have not only brought glory to the Caribbean but also inspired generations through their achievements. Literary contributions like C.L.R. James's *Beyond a Boundary* further elevate cricket's cultural importance, positioning it as a lens through which the region's historical and socio-political narratives can be examined (James, 1963).

Cricket has also served as a vehicle for nation-building and social transformation. Matches were not only moments of sporting triumph but also cultural affirmations of Caribbean identity. This legacy is reflected in oral histories, newspaper accounts, scorebooks, and memorabilia—all of which are valuable sources for documenting social history. As such, cricket collections must be curated with sensitivity to their multiple meanings and layered narratives.

The CLR James Cricket Research Centre

Digitisation of museum and archival collections enhances not only preservation but also access and educational engagement. This is particularly critical for materials such as the Centre's holdings, which possess both cultural and scholarly value. Similarly, Jin and Liu (2022) underscore the role of digitisation in media dissemination, further supporting the case for making cricket heritage accessible to diverse and global audiences.

Located at The UWI's Cave Hill Campus, the CLR James Cricket Research Centre holds a unique collection of primary and secondary resources on Caribbean and global cricket. Established in 2008 after the 2007 ICC Cricket World Cup held in the West Indies, it is named in honour of Cyril Lionel Robert James (1901–1989), Caribbean scholar and an icon of cricket studies. It is the only Centre of its kind in the world which is solely dedicated to the study of cricket. It provides research materials to scholars, researchers and lovers of the game. The collections include monographs, videos, paintings, videos and papers of West Indian cricket icons and scholars. The original manuscript of *Beyond a Boundary*, the seminal work of C.L.R. James himself, as well as the personal papers of Sir Pelham Warner, the Trinidad born, Barbadian raised, English cricketer and administrator who went on to become the President of the Marylebone Cricket Club are but a few of the treasures found within its walls. These holdings are not only academically significant but culturally invaluable. While physical access to these materials remains limited, digitisation offers a transformative opportunity to open up the Centre's rich resources to researchers, educators, students, and cricket enthusiasts around the world. Moreover, the Centre can act as a research hub for the digital humanities, linking historical materials to contemporary analyses of identity, race, and sport. Strategic investments in digitisation infrastructure and cross-campus collaborations can enable the CLR James Centre to be a model for Caribbean archival excellence.

Strategic and Operational Dynamics

Digitising cultural and research heritage is not merely a technical undertaking—it is a strategic intervention that requires alignment between institutional priorities, resource constraints, and cultural imperatives. The operationalisation of digitisation in heritage contexts must therefore be embedded in a broader institutional transformation agenda. This includes strategic foresight, governance restructuring, and

risk mitigation planning, especially within small island developing states (SIDS) where infrastructural and human capacity deficits are acute. The UWI's Digital Transformation project provides the perfect environment within which this cultural heritage work can occur.

At the strategic level, institutions must confront fundamental questions about mission alignment: How does digitisation advance the core objectives of access, preservation, and engagement? What trade-offs are required when resources are limited? These are not abstract queries but practical dilemmas faced by libraries, archives, and museums across the Caribbean. Prioritisation frameworks—grounded in criteria such as historical significance, condition of materials, user demand, and representational equity—must guide digitisation choices.

Operationally, the effectiveness of any digitisation initiative hinges on institutional readiness. This involves more than the procurement of scanners or software; it requires robust digital workflows, clear metadata protocols, cybersecurity safeguards, and continuous staff training. Moreover, institutions must adopt agile methodologies that allow for iterative design and stakeholder feedback. In this way, digitisation becomes a living process rather than a finite project.

Risk management is also a critical component. Without proactive measures, institutions risk data loss, misrepresentation, or the reinforcement of existing archival silences. For example, the failure to include community voices in annotation processes or interface design can perpetuate exclusion, even in a digital environment ostensibly aimed at inclusion.

In sum, strategic and operational planning for digitisation must be treated as a system-level intervention. It is not an adjunct to heritage management but a redefinition of how Caribbean memory institutions function in a digital age. This redefinition requires visionary leadership, institutional coherence, and regional collaboration to ensure sustainability, scalability, and cultural legitimacy.

Enabling Policy Frameworks

Effective digital heritage development hinges not just on technology or content, but on coherent, forward-thinking policy frameworks. The literature affirms this: Beagrie and Greenstein (1998) offer a comprehensive model for digital preservation that emphasises the integration of standards, funding mechanisms, and institutional

commitment. They note that the use of the strategic framework will assist stakeholders in 'identifying issues and dependencies and could assist in raising awareness of the strategic issues across a range of stakeholders' (Beagrie & Greenstein, 1998, p. 5). Aydogan (2022) complements this by emphasising the necessity for alignment with domestic legal structures and the adaptive capacity of national institutions. Parent et al. (2021) contribute a pragmatic dimension, focusing on criteria for selection and long-term curation of digital heritage within publicly accountable frameworks.

Policy development in the Caribbean context must be understood as a strategic act of cultural governance. Fragmented or outdated legal regimes risk undermining the utility and longevity of digitisation efforts. For instance, without robust intellectual property (IP) frameworks that balance fair use with creator rights, institutions may hesitate to make collections openly available. Similarly, the lack of harmonised licensing models across the region can inhibit collaborative initiatives, especially when collections span multiple jurisdictions.

A nuanced policy response must therefore address five interlocking domains:

- Intellectual Property and Licensing: Policies must move beyond static copyright protection to facilitate dynamic access for research, education, and public engagement. This includes the development of regional licensing templates that recognise common law traditions and allow for interoperable access regimes.
- Public-Private Partnerships (PPPs): Legal instruments should define the terms of engagement between cultural institutions and corporate or philanthropic actors, ensuring public accountability, data sovereignty, and equitable benefit-sharing from digitisation ventures.
- Funding and Incentives: Strategic fiscal policies—such as digitisation funds, tax relief for private contributions, and international grant alignment—are necessary to provide long-term financial underpinnings for heritage work.
- Green IT and Sustainability: Policies must mandate sustainable technology adoption, including lifecycle assessments of digital tools and infrastructure, with particular attention to energy efficiency, carbon impact, and responsible procurement.
- Gender-Inclusive Practices: National and institutional frameworks must ensure equity in staffing, representation, and access. Gender-

sensitive curation policies can address historical imbalances in the visibility of women in Caribbean heritage narratives.

Importantly, Caribbean policymakers must confront the geopolitical and structural limitations of small island developing states (SIDS). Issues such as digital sovereignty—control over data storage, processing, and jurisdiction—require collective action. A Caribbean Digital Heritage Charter, modelled on shared cultural and legal values, could serve as a foundational tool to coordinate metadata standards, ethical frameworks, and regional preservation protocols.

Finally, legislative reform should be prioritised to modernise copyright and data protection laws. These reforms must reflect both international standards (e.g. WIPO treaties, GDPR-inspired principles) and the specific needs of Caribbean users and creators. Without this policy scaffolding, even the most ambitious digitisation projects will be undermined by legal uncertainty, operational fragmentation, and constrained public value.

Opportunities

Digitising cricket heritage offers significant benefits, namely:

- Broader Access: Researchers and fans globally can engage with West Indies cricket history.
- Preservation: Digitisation safeguards fragile documents and memorabilia from deterioration.
- Educational Impact: Schools and universities can integrate heritage materials into curricula.
- Cultural Diplomacy: Digital archives can showcase Caribbean achievements on international platforms.
- Technological Innovation: AI tools can enhance user experience through OCR, facial recognition, and sentiment analysis.

Digitised heritage collections can also support entrepreneurship and innovation in the creative industries. For example, digital cricket content can be repurposed into documentaries, apps, museum installations, and online learning tools. This opens up avenues for youth engagement, skills development, and economic participation while celebrating regional heritage.

Future Plans

At the CLR James Cricket Research Centre, several future-oriented initiatives are envisioned, including:

- Comprehensive Digitisation: A phased digitisation programme of all high-value materials.
- Virtual Exhibits and Tours: Online showcases to coincide with anniversaries and international cricket events.
- Digital Humanities Collaborations: Partnering with scholars to create annotated digital editions and thematic research portals.

Additional plans include establishing a digital cricket storytelling lab that curates narratives using mixed media formats. The Centre also seeks to engage with schools through cricket history clubs and competitions that encourage the use of primary sources. By embedding the archives in community and educational activities, the Centre can become an active cultural resource rather than a static repository.

Insights and Recommendations

A critical insight into the digitisation of Caribbean cricket heritage is the necessity for sustainable financing mechanisms. Digitisation projects often require substantial initial investments in technology, skilled personnel, and infrastructure, as well as ongoing maintenance costs. Without secure and sustained funding, these initiatives risk becoming obsolete, leading to the deterioration of both digital and physical assets. Moreover, the absence of digitisation efforts can result in the loss of invaluable cultural narratives and the erosion of regional identity.

The Government of Barbados has demonstrated a clear appetite for heritage preservation through its Reclaiming Our Atlantic Destiny (ROAD) Programme. In 2025, Barbados signed a USD 75 million financing agreement with the Development Bank of Latin America and the Caribbean (CAF) to support the revitalisation of cultural heritage, including infrastructure modernisation and the development of heritage tourism. The ROAD Programme seeks to deepen national and regional historical consciousness and strengthen the cultural economy (CAF, 2025). This presents a compelling opportunity for symbiosis: cricket heritage digitisation aligns closely with the objectives of the ROAD Programme, particularly in promoting national identity, community engagement, and sustainable cultural tourism.

Recommendations to support this include:

- Establish Public-Private Partnerships (PPPs): Engage with private sector stakeholders, including technology firms and philanthropic organisations, to co-fund digitisation projects. Such partnerships can provide additional resources and expertise, ensuring the scalability and sustainability of digitisation efforts.
- Leverage Government Initiatives: Align digitisation projects with national programmes like the ROAD Programme to secure funding and policy support. This alignment can facilitate access to resources earmarked for cultural preservation and infrastructure development.
- Develop a Comprehensive Funding Strategy: Create a diversified funding model that includes government grants, international aid, and revenue-generating activities such as digital exhibitions and educational programmes. This approach can mitigate financial risks and ensure long-term project viability.
- Implement Robust Financial Planning: Establish clear budgeting, financial monitoring, and reporting mechanisms to manage funds effectively. Transparent financial practices can build trust among stakeholders and attract further investment.
- Advocate for Policy Support: Engage with policymakers to develop supportive legislation and policies that prioritise digital heritage preservation. This advocacy can lead to the creation of legal frameworks that facilitate funding and protect digital assets.

The decision to digitise cultural and research heritage collections is not merely a technical or logistical consideration—it is a strategic imperative. The failure to act carries significant risks that extend beyond the physical degradation of documents. One of the most pressing dangers is the irreversible loss of tangible materials such as manuscripts, photographs, scorebooks, and audiovisual records, many of which are stored in environments vulnerable to humidity, pests, or natural disasters. In the Caribbean, where tropical climates and constrained funding often hinder conservation efforts, this risk is exacerbated.

However, the implications are not solely material as heritage digitisation plays a pivotal role in shaping collective memory and public narratives. Without proactive digitisation, there is a risk of losing the intangible cultural value that cricket represents—specifically, the historical idea of West Indian unity, resilience, and excellence embodied in the achievements of the regional cricket team. In failing to digitise, institutions may also perpetuate inequities in access to heritage

resources, reinforcing a cultural divide between those who can physically access collections and those who cannot.

From a policy standpoint, Parent et al. (2021) note that institutions without digital preservation strategies are increasingly unable to fulfil their mandates in an era dominated by digital scholarship and global information exchange. This places them at a disadvantage in academic collaborations, funding opportunities, and public relevance. Certainly, The UWI must guard against this.

In light of these risks, the following strategic and research-based recommendations are proposed to policy makers:

1. Invest in Infrastructure: Secure funding for digitisation equipment, IT support, and cloud storage solutions.
2. Develop Capacity: Offer ongoing training in digital preservation, metadata creation, and user-centered design.
3. Strengthen Policies: Implement institutional guidelines on digital ethics, copyright, and sustainable practices.
4. Leverage AI Responsibly: Use AI to enhance access and engagement while safeguarding privacy and fairness.
5. Foster Inclusive Narratives: Ensure that digitised collections reflect gender diversity and the contributions of marginalised voices.
6. Measure Impact: Use analytics and community feedback to guide improvements and demonstrate value to funders and stakeholders.
7. Embed Digital Heritage in Education: Work with educators to create Caribbean-specific heritage modules based on archival materials.
8. Encourage Research Output: Incentivise scholarly publications and creative works that draw on digitised heritage collections.

Conclusion

Cricket is both a sport and a living archive of Caribbean history and identity. By strategically digitising and promoting cricket heritage, institutions like The UWI can ensure that the legacies of figures like C.L.R. James and generations of West Indian cricketers are preserved and made accessible for the future. With the right policy frameworks, collaborative partnerships, and community engagement, digital heritage can become a cornerstone of cultural empowerment, education, and regional development.

This paper has demonstrated that cricket archives are not merely about preserving the past—they are about informing the future. Through targeted strategies, inclusive policies, and responsible use of technology, Caribbean institutions can position cricket heritage as a vibrant domain of innovation, identity, and intellectual growth.

References

Aydogan, S. U., Münster, S., Girardi, D., Palmirani, M., & Vitali, F. (2022). A framework to support digital humanities and cultural heritage studies research. In F. Niebling, S. Münster, & H. Messemer (Eds.), *Research and education in urban history in the age of digital libraries. Second international workshop, UHDL 2019, Dresden, Germany, October 10–11, 2019, Revised Selected Papers* (pp. 237-267). Springer. https://doi.org/10.1007/978-3-030-93186-5_11

Beagrie, N. & Greenstein, D. (1998). *A strategic policy framework for creating and preserving digital collections*. British Library Research and Innovation Centre. https://www.ukoln.ac.uk/services/elib/papers/supporting/pdf/framework.pdf

Beckles, H. (1998). *The development of West Indies cricket. Volume 1: The age of nationalism*. University of the West Indies Press.

CAF. (2025, February 21). *CAF and Barbados sign USD 75 million agreement to advance cultural heritage and tourism development*. Development Bank of Latin America and the Caribbean. https://www.caf.com/en/currently/news/caf-and-barbados-sign-usd-75-million-agreement-to-advance-cultural-heritage-and-tourism-development/

James, C. L. R. (1963). *Beyond a boundary*. Hutchinson.

Jin, P., & Liu, Y. (2022). Fluid space: Digitisation of cultural heritage and its media dissemination. *Telematics and Informatics Reports*, *8*, Article 100022. https://doi.org/10.1016/j.teler.2022.100022

Parent, I., Seles, A., Storti, D., Banda, F., Blin, F., McKenna, G., Lee, I., Murdock Smith, J., Chee, J., Hagedorn-Saupe, M., Knight, S., Roberts, W. (2021). *The UNESCO/PERSIST guidelines for the selection of digital heritage for long-term preservation* (2nd ed.). IFLA. https://repository.ifla.org/handle/20.500.14598/1863

Further Readings

Barbados Tourism Encyclopedia. (n.d.). *Barbados heritage district*. https://barbados.org/barbados-heritage-district.htm

McIlwaine, J., Comment, J.-M., Wolf, C. de, Peters, D., Justrell, B., Varlamoff, M.-T., & Koopman, S. (2002). *Guidelines for digitization projects for collections and holdings in the public domain, particularly those held by libraries and archives*. IFLA. https://repository.ifla.org/handle/20.500.14598/697

National Library of Australia. (2003). *Guidelines for the preservation of digital heritage* (No. CI-2003/WS/3). UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000130071

OECD. (2019). *Recommendation of the Council on artificial intelligence* (No. OECD/LEGAL/0449). https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449

Abstract

This paper explores the strategic and operational dynamics involved in valorising and promoting cultural and research heritage collections, with a specific focus on cricket in the Caribbean. It examines how digital technologies can improve the visibility and accessibility of cricket archives, thereby preserving and disseminating a rich cultural legacy. The paper also explores the role of public policy in fostering digital heritage development and sustainable partnerships. The paper proposes practical frameworks for ensuring that the Caribbean cricket heritage continues to thrive and contribute to the region's cultural richness in the digital era.

Keywords

Digital archives; Cricket heritage; Caribbean culture; Public policy; Technology integration

Book Contributors

Renaud Adam, Head of the Library Digitisation Unit

Université de Liège (University of Liège)

iD   https://orcid.org/0000-0001-7390-8480

Historian of early modern books, Renaud Adam (b. 1977) is in charge of the ULiège Library's digitisation unit. He is also a scientific collaborator in the Modern History Department. His work focuses mainly on the book ecosystem in the former Low Countries (15th-17th centuries), with particular attention to socioeconomic issues, cultural transfers and the reception of Italian culture. For several years now, Renaud has also been interested in questions of censorship and the ways in which it is expressed.

Laurent Aucher, Head of IT Department – Digital Library Project Manager

Université Paris-Cité (Paris Cité University)

iD   https://orcid.org/0009-0005-8679-6453

During his long career in academic libraries, Laurent Aucher has worked on almost every aspect of librarianship: ILL, serials, electronic resource management, digitisation, team management, staff training and more. Since 1997, Laurent has managed numerous library systems and website projects worldwide. He is also involved in non-profit associations such as ACEF, a French-speaking group of Ex Libris users, and AUFO, a French-speaking group of Omeka users. In the past 10 years, he has developed a particular interest in the dissemination of digital collections.

Eva Ausēja, Head of Digital Library of Latvia

Latvijas Nacionālā bibliotēka (National Library of Latvia)

https://orcid.org/0009-0007-4360-6538

Eva Ausēja currently serves as the head of the Digital Library of Latvia at the National Library of Latvia (*Latvijas Nacionālā bibliotēka*). She specialises in the preservation and accessibility of digital cultural heritage, with a strong emphasis on integrating regional libraries into national digitisation initiatives. Eva has a Master in Library Science and Information Management from the University of Latvia. She has managed and developed numerous digital collections, including the Industrial Heritage project, in collaboration with national, regional, and private partners. Her professional achievements include advancing digital curation practices and fostering the growth and accessibility of the Digital Library of Latvia. Eva's publication, *Overview of Digitisation in Regional Main Libraries* (2023), highlights her dedication to sharing knowledge and promoting collaboration in the library community.

Junior Browne, Law Librarian

The University of the West Indies

https://orcid.org/0000-0002-6673-2613

Junior Browne is the law librarian at the University of the West Indies, Cave Hill Campus, where he currently manages both the Faculty of Law Library and the CLR James Cricket Research Centre. His work focuses on legal research access, Caribbean legal history, data privacy, and digital transformation in libraries. Junior is currently pursuing his postgraduate certification in Archival Studies, intending to strengthen regional approaches to heritage preservation and access. His research interests include the governance of data and information in the Caribbean, the legal and ethical implications of artificial intelligence, and the development of legal knowledge systems.

Joris Colla, Head of Collection Management of KADOC

KU Leuven

iD https://orcid.org/0000-0003-3826-9593

Joris Colla (b. 1983) studied History and International Relations at KU Leuven. Since 2009, he has been working at KADOC-KU Leuven. Until 2025, he was the data manager of ODIS and a heritage expert specialising in Catholic heritage, educational heritage, and intangible heritage. In 2025, Joris became head of KADOC's Department of Collection Management. He is also the coordinator of the ODIS Renewal Project 2022–2027. His research focuses on the religious and cultural history of Belgium in the long 19th century.

Nicolas Di Méo, Head of the Library Collections Department

Université de Strasbourg (University of Strasbourg)

iD https://orcid.org/0009-0009-3232-760X

Nicolas Di Méo (b. 1978) holds a PhD in French literature and has published and directed several academic books on 20th-century literature. He worked as a teacher, a lecturer and a researcher before joining the French Ministry of Higher Education and Research in 2012. Since 2014, Nicolas has been the head of the Collections Department at the Strasbourg University Libraries.

Mălina Duță, Special Collections Librarian

Universitatea de Vest din Timișoara (West University of Timișoara)

iD https://orcid.org/0009-0008-6306-0058

Mălina Duță (b. 1985) is a special collections librarian at the Central University Library Eugen Todoran of Timișoara, where she oversees an extensive oral history archive comprising approximately 500 testimonies and interviews related to the history, culture, and sociology of the Banat region, Romania. Moreover, she manages the associated material, such as photographs and other primary source documents. Currently a PhD candidate at the West University of Timișoara, Mălina's research focuses

on forced migration. Her academic interests encompass cultural anthropology, international cultural projects, and the study of marginal communities, with a particular emphasis on migration and diasporic experiences.

Olivier Ghuzel, Document and Software Engineer

Université Paris-Cité (Paris Cité University)

iD   https://orcid.org/0000-0002-0602-6223

Olivier Ghuzel describes himself as 'a bit literary and a bit software engineer'. He has raised digital library ecosystems for 12 years.

Despoina Gkogkou, Librarian

Πανεπιστήμιο Πατρών (University of Patras)

iD   https://orcid.org/0000-0001-5120-8192

Despoina Gkogkou (b. 1975) holds a PhD and a Master of Arts in Modern Greek Literature and a bachelor's degree in Library Science. She has worked as a librarian since 1997, first at the Academy of Athens Research Centre for Modern Greek Dialects and then at the Samos Public Library. She joined the Library and Information Centre of the University of Patras in 2008, where she is primarily responsible for the management and curation of the institutional repository, the digital collections, and the Μετάdata database. Despoina's research interests include the Greek press, mass culture, the sociology of reading, and the reception of foreign literature in Greece.

Christian Hänger, Department Director

Bundesarchiv (German Federal Archives)

iD   https://orcid.org/0000-0003-2874-1161

Christian Hänger is a department director at the Federal Archives in Germany. He is responsible for the storage, preservation, and digitisation of all materials held at the Federal Archives, including paper records,

books, photographs, and films. Over the past 5 years, he has developed a comprehensive infrastructure for the digitisation of these materials and introduced digitisation on demand (DoD) in all of the institution's reading rooms. In his previous career, Christian was responsible for library systems and the digitisation of cultural heritage at two university libraries.

Saga Jacksen, Information Specialist

Kansalliskirjasto (National Library of Finland)

iD https://orcid.org/0009-0004-5929-3060

Saga Jacksen (b. 1996) holds a master's degree from the University of Helsinki's Cultural Heritage programme and is currently pursuing a PhD in the History and Cultural Heritage Doctoral Programme at the University of Helsinki. She works as an information specialist for Finna Services, managed by the National Library of Finland, with a focus on user experience research.

Laura Moré, Special Collections Librarian

Universitat de Girona - Universidad de Gerona (University of Girona)

iD https://orcid.org/0000-0001-9289-7895

Laura Moré (b. 1975) holds a degree in Librarianship and Documentation from the University of Barcelona and in Documentation from the Open University of Catalonia. She has specialised in bibliographic heritage, having earned both a postgraduate diploma and a master's degree in Heritage Libraries and Collections from the University of Barcelona. Currently, she is pursuing a doctoral programme at the University of Barcelona; her research focuses on the incorporation of personal archives into Catalan university libraries. Since 2001, Laura has been working at the University of Girona Library, in the Technical Processing section. For more than a decade, she has also served as a special collections librarian.

Cécile Oger, Heritage Collections Curator

Université de Liège (University of Liège)

iD https://orcid.org/0009-0005-7845-121X

Cécile Oger (b. 1973) is an art historian specialising in the technological and archaeometric analyses of ancient paintings, and she is a curator of the collections of manuscripts and old and rare books at ULiège Library. Her research is devoted to the study of ancient painting techniques. Cécile works mainly on illuminated manuscripts and easel paintings from the Ancient Low Countries and the Principality of Liège from the 15th and 16th centuries.

Riitta Peltonen Lead UX Designer

Kansalliskirjasto (National Library of Finland)

iD https://orcid.org/0009-0000-3886-0709

Riitta Peltonen has worked with the National Library of Finland since 2017, developing the UX of both the Finna services and the processes of the unit. She holds a master's degree in science (2004) and service design (2018) and is currently pursuing a doctoral degree in applying human-centred design (HCD) in digital ecosystems, using Finna as her research ecosystem. Before joining the National Library, Riitta had a long career in the ICT industry as a UX specialist, including eight years at Nokia in architecture and system design and the nokia.com website and four years as a consultant. HCD was novel in Finland when Riitta completed her MSc, and she has seen its methods gain importance in the ICT industry throughout her career.

Francesca Petricca, Training Manager

ProQuest

iD https://orcid.org/0009-0004-1052-7508

Francesca Petricca (b. 1982) holds a PhD in Islamic Studies from Martin Luther University Halle-Wittenberg. During her fieldwork, she worked for two years in the archives of Dar al-Kutub al-Qawmiya in Cairo.

After graduation, Francesca moved to the publishing sector, where she has since covered different roles. She joined ProQuest in 2018 and is involved in the promotion of historical collections.

Annika Peurell, Team Leader for Media

KTH Kungliga Tekniska högskolan (KTH Royal Institute of Technology)

iD https://orcid.org/0009-0002-3431-4107

Annika Peurell (b. 1972) works as a team leader for Media at the Royal Institute of Technology (KTH) Library in Stockholm. Her focus area at KTH is collection development and publication infrastructure. Annika has a keen interest in the importance of and the challenges and opportunities in all aspects of cultural and research collections at archives, libraries, and museums. She has degrees in Library and Information Science, Art History and Ethnology from Uppsala University. Annika has been involved in several cultural heritage and research institutions in Sweden in leading roles. She has also headed projects in areas such as acquisition, preservation, metadata, research, digitisation, and digital accessibility.

François Renaville, Head of Library Systems

Université de Liège (University of Liège)

iD https://orcid.org/0000-0003-1453-1040

François Renaville (b. 1976) studied linguistics, literature, and translation before beginning his career as a teacher. He later joined the University of Liège Library as a subject librarian, where he has been working on library systems since 2005. From 2010 to 2014, he served as a policy officer for the French-speaking Belgian library consortium BICfB, and from 2020–2021, he worked as a systems consultant for the European Parliament Library. Since 2022, François has been coordinating the Systems & Data unit at ULiège Library. His professional interests include discoverability, integrations, delivery, and user services.

Laurence Richelle, Metadata and Resource Management Coordinator

Université de Liège (University of Liège)

iD   https://orcid.org/0009-0003-2505-2181

Laurence Richelle (b. 1972) has been a librarian since 1997. Trained in rare books cataloguing, she began her career at the Catholic University of Lille before joining the University of Liège Library in 2004 as a metadata specialist. Laurence later worked as a systems librarian and resource management coordinator. Since 2022, she has been a member of the Systems & Data unit at ULiège Library.

Gislene Rodrigues da Silva, Librarian

Universidad Carlos III de Madrid (University Carlos III of Madrid) / Universidade Federal de Minas Gerais (Federal University of Minas Gerais)

iD   https://orcid.org/0000-0003-2824-953X

Gislene Rodrigues da Silva (b. 1986) is a postdoctoral fellow at Universidad Carlos III de Madrid through the Marie Skłodowska-Curie YUFE4Postdocs programme. She also holds a postdoctoral position at the Federal University of Minas Gerais (UFMG), where she earned her PhD (2023) and Master in Knowledge Management. A qualified librarian with a background in information science, she is currently on leave from her role at UFMG's Physics Department library. Gislene coordinates science outreach projects and is the deputy coordinator of the Eureka Podcast. She is a member of the Brazilian Research Group on Knowledge Representation and Information Retrieval (RECRI/UFMG).

Marika Sarvilahti, Information Specialist

Aalto-yliopisto (Aalto University)

iD   https://orcid.org/0009-0004-8222-1487

Marika Sarvilahti MA (b. 1974) is an information specialist at Aalto University, Finland, where she oversees the digital preservation and

collection management system and manages access to the University's archival digital collections on the Finna search service. She also provides training and guidance on the use of visual resources for students and researchers. Her career in academic libraries and archives has had a special focus on art and design collections, digital preservation, visual resources, and digital cultural heritage as an information source. Marika specialises in metadata development, licensing issues, digital collection management, and information literacy in higher education. Her passion is in providing students and researchers with knowledge and skills to make the best use of digital cultural heritage in learning, research, and creative work.

Teresita Scalco, Head of Archivio Progetti

Università Iuav di Venezia (Iuav University of Venice)

iD https://orcid.org/0009-0008-0280-2951

Teresita Scalco (b. 1976) is the head of the Archivio Progetti at Università Iuav di Venezia, where she has worked since 2002 in curatorial and project coordination roles. She holds a BA in Contemporary Art History (University of Padua, 2002), a European Master in Architectural History (University of Roma Tre, 2006) with specialisation at UNESCO's World Heritage Centre in Paris, and a PhD in Science of Design (2013) focusing on curatorial practices in design culture. Her academic work began with a grant-supported thesis at the University of California, Santa Barbara, where she also worked as an assistant curator (1999–2000). Teresita has co-curated some editorial projects: *Istanbul. Ritratto di città* (with Moira Valeri, Letteraventidue, 2015), *Tobia Scarpa. L'Anima segreta delle cose* (Marsilio, 2015), *Images of the Modern: Construction Sites, Achievemens, Legacy* (with A. Marin, Do.co.mo.mo Journal 38/2025). Her research explores the ethical and educational dimensions of curatorship at the intersection of design, photography, and women's studies.

Rouven Schabinger, Senior Data and System Specialist

Swiss Library Service Platform (SLSP)

iD https://orcid.org/0000-0002-0249-7917

Rouven Schabinger has been working as a Data & System specialist at the Swiss Library Service Platform (SLSP) in Zurich since 2023. His main interests relate to data migration, collection management, and third-party integration. Rouven's previous professional and academic positions include the topics repositories (re3data.org) and research data management at the Karlsruhe Institute of Technology, as well as bibliographic and information technological consulting at the Württemberg State Library in Stuttgart (Germany).

Mimi Seyffert-Wirth, Director: Scholarly Communication and Marketing

Universiteit Stellenbosch (Stellenbosch University)

iD   https://orcid.org/0009-0000-8116-3589

Mimi Seyffert-Wirth is currently director of Scholarly Communication and Marketing at Stellenbosch University Library and Information Service, where she is responsible for the management of the institutional and digital heritage repositories, open access journal hosting, and the Marketing and Special Collections divisions. Mimi has experience in managing special collections and digital scholarship and plays a leadership role as a member of the Library's senior management team.

Stéphanie Simon, Library Operations Director

Université de Liège (University of Liège)

iD   https://orcid.org/0000-0002-9591-9946

Stéphanie Simon (b. 1986) has been the operations director at ULiège Library since 2021. With a double Master in History (2009 and 2011), she joined ULiège Library in 2010. She was initially responsible for digitisation policy and projects, leading to the creation of a digitisation unit within the library and the launch of the DONum project. At the same time, she was first the subject librarian for the Information and Communication section and then in charge of acquisitions and the management of electronic resources for the library and the French-speaking Belgian consortium (BICfB).

Nikol Stepan, Senior Data and System Specialist / Business Analyst

Swiss Library Service Platform (SLSP)

iD   https://orcid.org/0000-0003-2213-8644

Since 2019, Nikol Stepan has been employed as a Data & System specialist at the Swiss Library Service Platform (SLSP), with a primary focus on the 'Discovery' domain. In 2023, she expanded her role to include business analyst responsibilities, and she is actively involved in contributing to and managing various projects. Before SLSP, she served as an information specialist at a cantonal library. In her previous profession, she worked as a teacher. Nikol's academic background includes studies in requirements engineering, information science, and German studies from the University of Zurich.

Saskia van Bergen, Head Services & Collection Information

Universiteit Leiden (Leiden University)

iD   https://orcid.org/0000-0003-4300-9817

Saskia van Bergen is the head of Services and Collection Information at the Special Collections Department of Leiden University Libraries. In this role, she oversees a team of 14 employees and manages all aspects of access to the library's Special Collections, including cataloguing, digitisation, and research services. Her team handles the Special Collections Reading Room, digitisation projects, and teaching with special collections. Previously, Saskia served as a project manager in the library, where she led several initiatives, including the implementation of ArchivesSpace and Islandora. She also holds a PhD in Art History from Amsterdam University, focusing on medieval art and book history.

Maartje van den Heuvel, Curator of Photography

Universiteit Leiden (Leiden University)

iD   https://orcid.org/0009-0002-4157-4660

Maartje van den Heuvel (PhD) is an art historian specialising in photography. Since 2007, she has been the curator of photography and

photographic technology at the Special Collections of Leiden University Libraries, which not only holds the oldest 'photo-historical' collection of the Netherlands but also contains numerous scientific photography collections.

Acknowledgements

publishing and traditional academic publishing can successfully coexist. We extend our special thanks to Prof. Geoffrey Grandjean, Managing Director, and Cathy Prince, Editorial Director, for the thoughtful and attentive support they provided throughout the development of this project.

Finally, the editors wish to thank Pascale Renders (ULiège Library, Open Digital Publishing) for her advice on the use of Pressbooks to shape this book, and Charlotte Rambeaux for the design of the PDF export.