OPEN A GLAM LAB

No Rights Reserved

The authors have waived all copyright and related or neighbouring rights to *Open a GLAM Lab*.

However, we would appreciate it if you cite our work. Here is a proposed citation:

Mahey, M., Al-Abdulla, A., Ames, S., Bray, P., Candela, G., Chambers, S., Derven, C., Dobreva-McPherson, M., Gasser, K., Karner, S., Kokegei, K., Laursen, D., Potter, A., Straube, A., Wagner, S-C. and Wilms, L., with forewords by: Al-Emadi, T. A., Broady-Preston, J., Landry, P. and Papaioannou, G. (2019) *Open a GLAM Lab. Digital Cultural Heritage Innovation Labs*, Book Sprint, Doha, Qatar, 23-27 September, 2019.

Open a GLAM Lab

University College London (UCL) Qatar is dedicating this book to the 100th anniversary of library education at UCL – the first academic programme for library professionals in Great Britain and, fittingly, started by a University that has been bringing forward disruptive thinking since 1826. What could be a greater celebration of this spirit than the combination of an innovative process used to create a pioneering book on GLAM Labs that act as disruptors in the heritage sectors? UCL Qatar also marks its 10th anniversary and final year of operation and sees this book as one of its living legacies not only in Qatar, but for the world.

Facilitated by

BookSprints®

Main organisers / sponsors

UCL
كلية لندن الجامعية قطر
UCL QATAR
عضو في مؤسسة قطر
Member of Qatar Foundation

جامعة قطر
QATAR UNIVERSITY

BRITISH LIBRARY

LIBRARY
LIBRARY OF CONGRESS

Other participating institutions

DET KGL. BIBLIOTEK

FUNDACIÓN BIBLIOTECA VIRTUAL MIGUEL DE CERVANTES

GHENT UNIVERSITY

HISTORY TRUST OF SOUTH AUSTRALIA

Government of South Australia

ΕΛΛΗΝΙΚΟ ΙΔΡΥΜΑ ΠΑΡΑΔΟΣΗΣ · ΕΛΛΗΝΙΚΟ ΙΔΡΥΜΑ ΠΑΡΑΔΟΣΗΣ

KB national library of the netherlands

National Library of Scotland
Leabharlann Náisiúnta na hAlba

KBR Where time is treasured

UNIVERSITY of LIMERICK
OLLSCOIL LUIMNIGH

STATE LIBRARY®
NEW SOUTH WALES

DX·Lab

Österreichische Nationalbibliothek

Universitat d'Alacant
Universidad de Alicante

Print publication
supported by Qatar University Press.

دار نشر جامعة قطر
Qatar University Press

Foreword 7
Foreword: GLAMs and Labs 8
Foreword: Qatar National Library 12
Foreword: Chartered Institute of Library and Information Professionals (CILIP) 18
Foreword: QU Press 21
Acknowledgements 23
The authors 25

Introduction 27
About this book 28
Summary 31

Introducing GLAM Labs 33
Defining a Lab 34
Benefits of a Lab 41
Key points 45

Building a GLAM Lab 47
Values 48
Designing a Lab 50
Realising a Lab 58
Key points 66

GLAM Lab Teams 67
Forming the Lab team 68
Team allies 74
Letting teams thrive 77
Key points 81

User Communities 83
Understanding users 84

Engagement 86
Collaboration and partnerships 91
Key points 97

Rethinking Collections as Data **99**
About digital collections 100
Sharing data 101
The Lab Data Recipe 113
Key points 115

Transformation **117**
Labs championing change 118
From prototype to practice 122
Key points 128

Funding and Sustainability **129**
Funding 130
Sustainability 141
Retirement and decommission 146
Key points 148

Into the Future with GLAM Labs **149**
Into the future with GLAM Labs 150

Annexes **151**
Bibliography and further reading 152
Acronyms 159
Data Formats 161
Colophon 164

Foreword

Foreword: GLAMs and Labs

Dr Georgios Papaioannou
Associate Professor in Museology
University College London in Qatar & Ionian University, Corfu, Greece

Innovation Labs are widely discussed in the 21st century in the context of developing them in many different types of organisations. They have been considered as the next 'big thing' for companies, organisations and institutions which are embracing innovation, development, experimentation, new ideas through disruptive thinking, and generating opportunities. Can it be the same for Galleries, Libraries, Archives and Museums (GLAMs)? The answer of this book, which is itself a product of the innovative process of a Book Sprint (held in September 2019, Doha, Qatar), is 'yes'!

It describes what an Innovation Lab is in the GLAM context, and, what an Innovation Lab is for. Also, how to make one happen! This book addresses characteristics, aims and objectives, processes and prospects, tools and services, as well as legal, financial and operational issues. Significantly, it addresses how galleries, libraries, archives, museums, heritage institutions and other information centres and organisations can operate and benefit from Innovation Labs. Can Innovation Labs be part of such organisations and institutions, and assist them in their mission, vision, values, aims and objectives? I strongly believe so. This book shows why, how and to what end.

Innovation Labs relate to people, minds, and mentalities, and that are integral to GLAMs' operations in the 21st century. Innovation Labs relate to GLAM missions and visions, and address GLAM concerns, practices and opportunities by exploring staff talents and other in-house capabilities. They do this in various ways: incubating new and innovative ideas and processes, making the most of the data-based and data-driven world, investing in long-term and slow-process development, providing links to external bodies (such as companies,

institutions, academia, research centres, startups, individuals), adding to the participatory character of GLAMs and their relation and connection to visitors and users; and offering the space for constructive testing, safe experimenting, and learning from unavoidable but welcomed beneficial failures.

An Innovation Lab can be a physical space, but it does not necessarily have to be so. A gallery, a library, an archive and / or museum may offer rooms, spaces and infrastructure for the development of an Innovation Lab, but, they may also not. Fostering innovation does not inescapably involve a real, physical space to label as a 'Lab'. Innovation relates more to mentalities and practices, and to investing in people, time and tolerance within a work environment. Do not refrain from the Innovation Lab idea in your GLAM, if your first thought points to lack of office space, work rooms and infrastructure. Without underestimating the value of available space and material, a starting point can be an open mentality from the organisation's decision makers and the willingness of GLAM staff towards devoting time, energy, skills, creativity and effort.

Innovation Labs happen and succeed because of people rather than spaces. Success relates to skills and competences as well as to decision making, empowerment, trust, tolerance, and investment by thinking outside the box. A well-known example is that of Google's decision to encourage all staff to spend 20% of their work time on side projects that facilitate creativity, collaboration and inclusivity. In a GLAM environment, skills and capabilities are taken for granted. Innovation Labs are investments in the talents, strengths and other in-house capabilities as well as a chance for their further exploration and development of staff. With Innovation Labs, GLAMs develop both the organisation and their people. They also provide attractive incentives for people to stay and thrive, and for more talent, skills and diversity to join.

Innovation Labs identify with the missions, visions, and values of GLAMs. For example, we often see the words information, study, education, enjoyment, community outreach, public engagement, inspiration, inclusivity, technology, and participation in GLAMs' mission and vision statements. Innovation Labs address the above

strategically and hands-on in a straightforward way. By fostering innovation, creativity and openness, Innovation Labs can offer links to GLAM with external bodies, such as companies, institutions, universities, research centres, community initiatives, and individuals. This further expands the participatory, inclusive and co-creating culture and character that GLAMs attempt to employ.

Incubating and nurturing original inventive ideas and processes are perhaps the main attributes of Innovation Labs. However, in a GLAM environment, these elements acquire special importance and value. GLAMs today need to be dynamic, adaptive, tolerant and active to the emerging social, political, natural and digital environments. Innovation Labs can spot emerging issues, tackle and address them both in the short and long term. A new development, a sudden and unexpected occurrence, an evolving trend in science, community and society, the environment and / or the world can be approached as inspiration for further thinking. This can lead to action, activities and interventions following reflection and experimentation in the Innovation Lab. And GLAMs need this.

Another important point addresses the relation of GLAMs and the need to operate and exploit opportunities presented by the data-based and data-driven world of the 21st century. Living in the 'Big Data World' — where immense quantities and qualities of (mostly digital) data are being generated and disseminated, GLAMs require managing data and data-mining solutions. In this landscape where a multiplicity of both on-site and online information exists, from the physical setting (library room, archive desk, museum and / or gallery exhibition) to websites, e-platforms, mobile apps and social media settings, Innovation Labs in GLAMs can offer beneficial suggestions and solutions.

In short, I believe that Innovation Labs can be especially useful for GLAMs and this book presents some of the ways in which they may be particularly beneficial to them. The development of such Labs in GLAMs can fruitfully support and expand GLAMs' missions and visions in the 21st century. This can be achieved by incorporating innovation in practices and by investing in staff, visitors, and users.

Innovation Labs, I believe, can be the medium to achieving a prosperous future for GLAMs.

Within this GLAM context of data, technology, innovation, new ideas and challenging thinking, University College London in Qatar (UCL Qatar) took the decision to host and support the writing and the publication of this book. It was a long journey from the idea to implementation, and all of us from UCL Qatar who worked to make it happen believe that we need to use every chance for innovation in our own practice. UCL Qatar serves the GLAM world academically by two postgraduate Masters degrees: MA in Library and Information Science, and MA in Museum and Gallery Practice, both accredited by CILIP (Chartered Institute of Library and Information Professionals). Thanks to the efforts of Dr Milena Dobreva-McPherson, Associate Professor in Library and Information Studies at UCL Qatar, and Mahendra Mahey, Manager of British Library Labs (BL Labs), we organised the first 'Digital Cultural Heritage Innovation Labs Book Sprint' held in Doha, Qatar, in the last week of September 2019. UCL Qatar, Qatar University Library and Books Sprint Ltd sponsored the event. The goal has been to 'create a new guide for setting up, running and maintaining a Digital Cultural Heritage Innovation Lab', contributing to a legacy for the Cultural Heritage sector. The result is this book in your hands! We hope it will help GLAM colleagues around the globe to advance their innovation practice and will strengthen the global innovation community of Labs enthusiasts!

Foreword: Qatar National Library

Patrice Landry
Chief Librarian and Deputy Executive Director
Qatar National Library

Qatar National Library is very happy to be involved in this Book Sprint initiative, and this preface is a modest contribution to the work undertaken by Milena Dobreva and Georgios Papaioannou from UCL Qatar and Mahendra Mahey from the British Library (BL) who manages BL Labs to organise this event in Doha. It also needs to be put in the context of having 16 participants locked up in a room in a Doha hotel for five days and countless hours to produce a book on the notion and reality of Innovation Labs in libraries worldwide. This preface was written as the group diligently and courageously tackled the mission that they had taken upon themselves to accomplish.

The setting up of the Innovation Labs at Qatar National Library is in a way very similar to the work of the Book Sprint group this week in Doha: starting from a blank canvas. The planning of the Qatar National Library started with a clean slate, with no preconceived notions of what a library should be. As a new 21st century library in the Digital Age, the national library needed to be not only an institution that collects and preserves Qatar's documentary heritage but also to provide Qatar's residents with a public library that provides resources and activities that foster discovery, creativity and learning. In addition, it also had to serve as a research library, to make available and promote the relevant documentary resources on the history and culture of Qatar and the Gulf region.

This spirit of a reimagined national library was taken to task by the architect, Rem Koolhaas, who created an innovative and creative use of space to meet the needs of all patrons — children and young adults, students, researchers and academics, visually impaired people, and users with disabilities. By embedding technology throughout its physical architecture, services and programmes, and by opening the building's space for innovative and creative activity,

the Library changed the way the space is used and is effectively changing the very nature of patrons' library experience. The Library has promoted itself as a community space for Qatar's residents, with its open main floor evoking an urban plaza. It creates an environment of leisure, one in which patrons can wander around, browse the printed collections arranged in different levels around the plaza area, have coffee at the cafe or explore an interactive digital exhibition.

By creating attractive spaces for events and social interaction, the Library has achieved its goal of attracting more than 1.5 million visitors since its opening in November 2017. It also managed in two years since to organise an average of 100 monthly programmes using a variety of venues, tailored to the needs of each event. A case in point is the huge 'Special events' area, which can be used for lectures, panels, films and free monthly concerts by the Qatar Philharmonic Orchestra. While the sound of music fills the Library, students and researchers carry out their work undisturbed in traditional individual and group study areas.

Technology was also seamlessly incorporated into the building to subtly enhance the visitor experience. An automatic book return system is built into the shelves themselves, so books are returned faster to the appropriate shelving areas, improving both the availability of items and the shelving staff's work experience. Digital media walls are used for games, maps, programme information and digital exhibitions. These digital exhibitions on the media walls create an interactive opportunity for patrons that allows for a creative and more immersive discovery experience.

One growing trend in the 21st century is the gradual shift by libraries to accommodate the use of technology to help their users experiment, create and discover. Over the last 10 years, many libraries have embraced the notion of creating learning technology Labs as spaces for collaborative and creative applied learning. This shift toward facilitating 'learning by doing' in libraries has opened up new possibilities for libraries to engage with students and researchers in particular. The creation of creative tech Labs, called Innovation Stations, at the Library was inspired by the culture of technical innovation in the development of the Library.

The QNL concept of an Innovation / GLAM Lab differs from the book's definition where the focus is on experimenting with / curating digital collections and data. The Library is not yet at this stage of its development for various reasons but the experience of attracting patrons to take part in innovative activities plays an important role of building a community interested to explore further innovation possibilities when they will be offered. The Library is still in the process of building its digital collections, through partnership projects, such as the one with the British Library and by digitising its own historical collections. Exploiting these digital collections will require new expertise in curation and data analysis and should be integrated in a proper strategic approach. Experience in working with other institutions will certainly lead to creating a new perspective in expanding the digital Innovation Lab. QNL is very much looking forward to the book which should provide further guidance in setting up a GLAM Lab.

The concept of the Innovation Stations was developed with the view of having a space in the Library to foster creativity, collaboration and engagement, in line with Qatar Foundation's (QF) mission to be a 'place known for creativity, unlocking human potential and a place where knowledge will be fostered and shared'. The purpose was to create opportunities for people to come to the Library to learn, discuss, discover, test and create together. This offers a new type of literacy in Qatar, where our patrons can implement their ideas and learn about new technologies. This makerspace approach supports learning in an informal, play-focused environment that aims at cultivating an interest in science, technology and design.

The Innovation Stations consist of four rooms:

- Station 1 is a computer/digital production room for editing and developing digital and physical projects, and creating 3-dimensional (3D) designs.

- Station 2 is a music production room with a variety of musical instruments and recording equipment.

- Station 3 is a 3D printing and scanning space, including DIY electronics and tools such as virtual reality accessories and DIY equipment for sewing and embroidery.

- Station 4 is a videography / photography studio for shooting and editing videos and photos with the help of a green screen. The stations are set up to encourage patrons to use more than one studio to conceive, develop and produce creative work. For instance, students can use the computer room to design an object, which they will reproduce using the 3D printer and photograph using the photography studio.

A musician may record an original song, then go down the hall and create an accompanying music video. These stations are supported by the Library's Outreach and Community Engagement staff, who guide users and offer courses in 3D printing, videography / photography (Photoshop, video editing, green screen), virtual reality, Makey Makey for Kids, and basic coding. To support the use of the stations, our staff organised 173 workshops and programmes over the last 20 months. The Innovation Stations also support programmes organised by the Research and Learning Department, as well as the Children's and Young Adults' Library.

The Innovation Station concept and the creation of the four stations have been a great success since the opening of the Library. The education and research communities in Doha have taken advantage of the Innovation Stations to support their programmes. Individuals have also booked the Stations to further develop their knowledge, talent and skills, and develop their own projects and ideas. Measured by the number of visits, the Stations have been a resounding success. Between January 2018 and August 2019 (20 months), there were 1,784 bookings (reservations) for the music and photography stations, and 49,372 walk-ins across all four Stations during that time. We have also received highly satisfactory feedback from our patrons that confirms our first hand impressions of the use and appreciation of our services.

Of course, measuring creativity is an elusive art, and we have yet to truly understand the value that we have created with these stations. For instance, many of our users are schools that organise sessions at the library to put knowledge and ideas into practice. We know from the projects that we have witnessed that there is value created by the Innovation Stations, but we currently lack a tangible way of measuring it. To get a true picture of their impact, we need to create evaluation tools to measure how the Library has contributed to the learning process and outcomes. What is at stake is the notion of purpose. Is it enough to make the Innovation Stations available and be satisfied that they are used? Or should we find out how we are impacting our learning community and individuals? Have we helped shape young lives by introducing them to new experiences and possibilities? Will learning about 3D printing spark an interest in engineering? Have we given the next generation the tools to follow their dreams and become music producers, sound engineers and film directors?

In its first two years, Qatar National Library has demonstrated that the vision of a reimagined national library with its focus on its patrons' learning experience has proved to be the right approach. The growing number of visitors and registered members is a key indicator of the attractiveness of the Library by a broad segment of Qatar's population. The last two years have given us the confidence that our fundamental services and collections are being developed according to our needs and expectations. The challenges are twofold. First, how can we assure the sustainability of the quality and quantity of services and activities provided? Second, how can we progress to another level in expanding our existing services and providing new ones? The Library is still in the so-called 'honeymoon' phase — there is still a high level of motivation and engagement from our staff and a sense of novelty with our public. But there may be an eventual danger of 'events planning fatigue' when our staff loses motivation (as *déjà vu* sets in) and it becomes more difficult to continue to develop new and creative programmes.

In the case of the Innovation Stations, the challenge, of course, will be to maintain and manage the high level of use and services currently

provided by our staff. There are other issues that will need consideration. There are already some indications that the capacity of some of our stations is too small. For instance, the 3D printing station can only accommodate up to eight people, and its ceiling is too low to allow for full functionality. As we expand our technological services — for example, robotics support and training — we may need to create new Innovation Station spaces in other parts of the Library. Another challenge is to expand our community engagement in the use of Innovation Stations. There is strong engagement from schools and frequent patrons, but we still need to address how effective we have been at reaching out to other communities, such as Qatari nationals, underprivileged users or older generations. And lastly, we must constantly be looking for ways to improve our ability to correctly measure the impact the Innovation Stations and our engagement have had on our patrons' learning, creativity and innovation.

The Book Sprint initiative, co-funded by UCL Qatar, Qatar University Library, The British Library and the Library of Congress of the USA, which took place in Doha, is a welcome contribution to the discussion of Innovation Labs in libraries. We must remember that Innovation Labs in libraries is a fairly recent concept and only put in place in libraries in the last 10 years or so. Innovation Stations at the Qatar National Library are still evolving and it is expected that new services will need to be added in the next few years in response to new patron needs and expectations. Contributions such as the Doha Book Sprint initiative are necessary to encourage the expansion of such services in the core activities of libraries, and more importantly, to expand the Innovation Labs concept to include new technologies and Labs.

Foreword: Chartered Institute of Library and Information Professionals (CILIP)

Judith Broady-Preston
President-Elect CILIP: The Library and Information Association
Editor in Chief, Global Knowledge, Memory and Communication
Professor Emerita, Aberystwyth University, UK

"Librarianship is a profession that is not afraid to reinvent itself" (Elves, 2017,89)

Change and innovation are the enduring hallmarks of the library and information profession. Parcell (2019) maintains that libraries have survived due to their "culture of cooperation and innovation… becoming centres of digital practice… navigating changes in digital content and scholarly communications". The GLAM Handbook embodies all aspects of Parcell's statement; innovative and transformational in production and publication as well as content.

The creative collaboration, teamwork and consensus building required to produce a Handbook via the Book Sprint method is a perfect fit for the sector and the topic. Book Sprint (according to its website) is an idea originally conceived in 2005 by Thomas Krag, as a collaborative process taking several months. Adam Hyde developed this original idea further in 2008 by designing a method for a five-day event writing documentation for Free Open Source Software, subsequently refined and tested further (2019). The GLAM Handbook is based on this latter method.

Earlier examples from the library and information profession include the Open Science Handbook created in 2018 by a team based at the TIB (German National Library of Science and Technology) as "an open, living handbook on Open Science training". The facilitators, Heller and

Brinken share tips and experiences in an LSE Impact blog "How to run a book sprint in 16 steps".

As the title indicates, this handbook focuses on building a GLAM Innovation Lab. Innovation Labs represent a contemporary approach to effecting systemic change by creating solutions to problems or issues too large for any one country or organisation to resolve alone. The defining features of such Labs include the need for heterogeneous participants and targeted collaboration; "imagining the impossible" and "discovering the future" (Gryszkiewicz, Toivonen, & Lykourentzou, Nov. 3, 2016).

Its publication is timely for several reasons. In June 2019 the European Union published the Cultural Heritage: Digitisation, Online Accessibility and Digital Preservation report, reviewing and consolidating progress in "digitising cultural heritage and making it available online in the public domain as well as in-copyright". Equally, the emphasis on equality of contribution as well as equality of access to materials represented by both the production methods and content of the Handbook, resonates with the values outlined in the IFLA Strategy 2019-2024, launched in August 2019 and endorsed by CILIP: The Library and Information Association, amongst others.

As outlined in the following chapters, libraries and librarians are collaborating with colleagues in cognate sectors, embracing positively the challenges presented by the increasing demands of managing and making digital cultural heritage content freely available in the public domain. For the future, not only will the sector need to navigate changes in digital content and scholarly communication but will need to pre-empt the challenges presented by developments in artificial intelligence, cyber security and big data. Predicted in the report Harnessing the Power of AI: The Demand for Future Skills, published on 30th September 2019, is that 133 million new jobs will be created globally by the adoption of artificial intelligence by industry.

In this rapidly evolving world, the opportunities for the GLAM profession are enormous and exciting; the expertise and skill set present in the sector result in our being uniquely positioned to

deliver and lead this futuristic skills agenda. The GLAM Handbook is a starting point: the team gathered in Doha, Qatar in September 2019 to create this work, represent a global commitment to cultural collaboration and innovation, capturing the pioneering spirit of contemporary professionals from galleries, libraries, archives and museums. I am pleased to have been invited to write a foreword to this exciting experiment, serving as a model for the sectors in so many ways.

Foreword: QU Press

Dr. Talal Al-Emadi
QU Press Director and Oil and Gas Law Professor

To celebrate the 2019 International Open Access (OA) Week in collaboration with institutions from Qatar and beyond, we at Qatar University Press (QU Press) are pleased to be the publisher of this Book Sprint initiative. I want to start by thanking QU Library, represented by its Director Samia Al-Shiba, for the thoughtful approach. I equally thank all partners of this initiative for deciding to have the product available to everyone, i.e. OA. This is exactly reflecting our, as a university publishing house, commitment to raise community awareness on the importance and high impact of OA publishing.

GLAM institutions – galleries, libraries, archives and museums – promote identity and are sources of inspiration and innovation. When their data are digitized, it can be accessible to everyone. Like all labs and clinics in different fields, GLAM Labs play a pivotal role in the transformation of GLAMs. What is in our hands today is a result of what a group of sixteen experts from around the world did during this past September in Doha to produce the "Open a GLAM Lab" handbook.

The handbook answers the importance of building GLAM Labs, highlighting their vital role in changing the future of digital cultural heritage. It provides a detailed insight on the design and implementation of a Lab within the GLAM context. It also presents the benefits of a Lab to GLAMs, users, and society and highlights the qualities and skills to look for in Labs teams. The handbook also describes the procedure to ensure the sustainability of a Lab and provides insights on how to identify, access, and reuse digital collection as data and on how to transform tools into operational services.

In closing, I want to highlight that QU Press places OA at the heart of its mission, which is “to publish first-rate research and educational resources and make them accessible to all”. The Press currently hosts six peer-reviewed and OA journals in various fields, and we are planning OA programs for books as well. I wish everyone a happy reading and a successful International OA Week around this small world.

Acknowledgements

Authors:

The book is a collective outcome with contributions from Mahendra Mahey, Abigail Potter, Aisha Al-Abdulla, Armin Straube, Caleb Derven, Ditte Laursen, Gustavo Candela, Katrine Gasser, Kristy Kokegei, Lotte Wilms, Milena Dobreva-McPherson, Paula Bray, Sally Chambers, Sarah Ames, Sophie-Carolin Wagner and Stefan Karner.

Co-funders:

UCL Qatar, Qatar University Library, The British Library and the Library of Congress, USA

Organising committee:

Mahendra Mahey (BL), Milena Dobreva-McPherson (UCL Qatar), Georgios Papaioannou (UCL Qatar), Samia Al-Shiba (Qatar University Library), Somia Salim (UCL Qatar) and Dania Jalees (UCL Qatar)

External Reviewers

Wendy Durham, Ruth Hansford, Rachel Withington and Jennifer Quealy

Institutions which supported the initiative, providing their staff members with time to attend:

- Austrian National Library / Österreichische Nationalbibliothek, Austria
- The British Library, UK
- Fundación Biblioteca Virtual Miguel de Cervantes, Spain
- Ghent Centre for Digital Humanities, Ghent University, Belgium
- History Trust of South Australia, Australia
- Library of Congress, USA
- KB National Library of the Netherlands, The Netherlands
- National Library of Scotland, UK
- Qatar University Library, Qatar
- The Royal Danish Library / Det Kgl. Bibliotek, Denmark
- State Library of New South Wales, Australia
- UCL Qatar, Qatar
- University of Alicante, Spain
- University of Limerick, Ireland

The authors

- **Abigail Potter**, Senior Innovation Specialist at the Library of Congress with the **LC Lab** working to support new and creative uses of digital collections that engage diverse audiences.
- **Aisha Al-Abdulla**, Section Head of the Digital Repository and Archives at **Qatar University Library**, managing the first Open Access Institutional Repository QSpace in the State of Qatar.
- **Armin Straube**, Teaching Fellow in Library and **Information Studies** at **UCL Qatar**. And he is an archivist with work experience in data curation, digital preservation and web archiving.
- **Caleb Derven**, Head of Technical and Digital Services at the **Glucksman Library**, University of Limerick with overall responsibility for strategy and operations related to collections, digital resources and library systems.
- **Ditte Laursen**, Head of Department, **Royal Danish Library**, is responsible for the acquisition of digitally born cultural heritage materials, long-term preservation of digital heritage collections, and access to digital cultural heritage collections. She is also Member of the board of the **Digital Humanities in the Nordic Countries**.
- **Gustavo Candela,** Associate Professor at the **University of Alicante** and member of the Research and Development department at **The Biblioteca Virtual Miguel de Cervantes**.
- **Katrine Gasser**, Section Head of IT at **KB Labs** in the **Royal Danish Library**, managing a team of experts in programming, networking and research.
- **Kristy Kokegei**, Director of Public Engagement at the History Trust of South Australia oversees the organisation's public programming, **digital engagement**, marketing, learning and education programmes across 4 state government-funded museums, supporting and enabling 350 community museums and historical societies across South Australia.

- **Lotte Wilms**, Digital Scholarship advisor managing the **KB Lab** and co-chair for the **LIBER Working Group Digital Humanities** and a board member of the **IMPACT Centre of Competence**.
- **Mahendra Mahey,** Manager of **British Library Labs** (**BL Labs**), an Andrew W. Mellon foundation and British Library-funded initiative supporting and inspiring the use of its **data** in innovative ways with scholars, artists, entrepreneurs, educators and innovators through competitions, awards and other engagement activities.
- **Milena Dobreva-McPherson,** Associate Professor Library and **Information Studies** at **UCL Qatar** with international experience of working in Bulgaria, Scotland, Malta and Qatar.
- **Paula Bray**, **DX Lab Leader** at the **State Library of NSW** is responsible for developing and promoting an Innovation Lab utilising emerging and existing web technologies to deliver new ways to explore the Library's collections and its data.
- **Sally Chambers**, Digital Humanities Research Coordinator at **Ghent Centre for Digital Humanities, Ghent University, Belgium** and National Coordinator for DARIAH, the Digital Research Infrastructure for the Arts and Humanities in Belgium. She is one of the instigators of KBR Digital Research Lab at the Royal Library of Belgium.
- **Sarah Ames**, Digital Scholarship Librarian at the **National Library of Scotland**, responsible for the Digital Scholarship Service and the **Data Foundry**.
- **Sophie-Carolin Wagner**, Co-Founder of Research Institute for Art and Technology (RIAT), Co-Editor of the **Journal for Research Cultures** and Project Manager of **ÖNB Labs** at the Austrian National Library.
- **Stefan Karner**, Technical Lead of the **ÖNB Labs** at the Austrian National Library, co-responsible for developing a platform to provide access to some of the library's data and metadata, for users to create and share annotations and other data.

Please get in touch.

Introduction

About this book

In late September 2019, our group of sixteen people from around the world gathered in Doha, in the State of Qatar. We were filled with the anticipation of reconnecting with colleagues, excited to meet new ones, in awe of the efforts of the coordinators Mahendra Mahey and Milena Dobreva-McPherson, and grateful to our hosts from UCL Qatar and Qatar University. We were naive but undaunted by the task in front of us: to write a book in five days! A book that we hoped would capture the pioneering spirit of Labs and the pride we have in contributing to this growing movement of GLAMs.

Making this book was hard but it was also very special. The themes you see reflected in this book: being open to experimentation, risk-taking, iteration, innovation, and transformation, also capture the methodology of the Book Sprint. The process of extracting ideas from sixteen heads and making a coherent narrative under extremely tight deadlines sometimes got messy. There were highs and lows, moments of brilliance, feelings that we'd never finish, and very late nights. We had to push each other to keep going, be uncomfortable, debate, disagree, come to a decision, and move forward to finish. Sometimes we didn't do this well, but we were always able to come together again over the many cups of coffee or the plentiful lunch buffets.

A book produced from scratch in five days can never be perfect, it can only ever reflect the thoughts of the people in the room, which was admittedly limited in terms of diversity. But, we brought a lot of inspiration with us. Our colleagues at our home institutions and our partners around the world were a big influence and we hope we characterise their work, and the movement in general, correctly. Any errors in the book are all our fault: please correct us. Our intentions are to offer a practical, but not boring, book about opening a GLAM Lab. We want you to learn from our experiences and to give you a running start. We also want to support and inspire each other to keep pushing our sector for broad access to our collections and services

and to keep finding new ways for our institutions to remain relevant for people now and in the future.

Thanks

Thank you to Laia Ros for guiding us through this unforgettable process and for helping us to gather and combine our knowledge into one book.

A big and warm hearted thanks to Mahendra Mahey and Milena Dobreva-McPherson for organising the event and for spoiling us with tours of incredible libraries (Qatar University Library, UCL Qatar; Qatar National Library); mindfulness; delicious food; an amazing cake; and insight into Qatari culture.

A big thanks to Qatar University, Qatar National Library and UCL Qatar for the tours of your organisations and for adding some wonderful people, now our friends, to our group: Aisha Al-Abdulla; Armin Straube; Dania Jalees; Somia Salim.

To the Mövenpick Hotel staff: a huge thanks for making sure that we did not run out of coffee (you made all the difference).

Background

This book has been inspired by the International GLAM Labs Community, that was born in 2018 at the event on **global 'Library Labs'** held by the British Library. The event was attended by over 70 people from 43 institutions and 20 countries and followed up by a second **global GLAM Labs meeting** at the Royal Danish Library in Copenhagen in Spring 2019. The community has now grown to 250 people, from more than 60 institutions, in over 30 countries. Based on the huge interest and need for sharing knowledge about growing Labs at GLAM institutions, a Book Sprint was planned. You are now looking at the results.

A note about hyperlinks: the digital version of this book contains hyperlinks; these don't appear in the print version.

Summary

Defining a GLAM Lab

A Galleries, Libraries, Archives and Museums (GLAM) Lab is a place for experimenting with digital collections and data. It is where researchers, artists, entrepreneurs, educators and the interested public can collaborate with an engaged group of partners to create new collections, tools, and services that will help transform the future ways in which knowledge and culture are disseminated. The exchanges and experimentation in a Lab are open, iterative and shared widely. This book describes why and how to open a GLAM Lab and encourages participation in a movement that can transform organisations and the communities they partner with.

Building a GLAM Lab

Building a GLAM Lab involves defining its core values to guide future work, fostering a culture that is open, transparent, generous, collaborative, creative, inclusive, bold, ethical, accessible and encourages a mindset of exploration. The Lab should be grounded in user-centred and participatory design processes and its staff should be able to clearly communicate what the Lab is about. It's important to think big but start small and establish quick wins to get up and running.

GLAM Lab teams

There are recommendations for the qualities and skills to look for in Labs teams, how to go about finding allies within and outside the institution, and ideas on how to create a nurturing environment for teams to thrive in. Labs teams have no optimal size or composition, and its team members can come from all walks of life. Teams need a healthy culture to ensure a well-functioning Lab which might be augmented intermittently by fellows, interns or researchers-in-residence. For a Lab to have lasting impact it must be integrated into the parent organisation and have the support of staff at all levels.

User communities

GLAM Labs will need to engage and connect with potential users and partners. This means rethinking these relationships to help establish clear and targeted messages for specific communities. In turn, this enables Labs to adjust their tools, services and collections to establish deeper partnerships based on co-creation, and open and equal dialogue.

Rethinking collections and Data

The book discusses the digital collections which are an integral part of Labs. It provides insights on how to share the collections as data, and how to identify, assess, describe, access, and reuse the collections. In addition, there is information about messy and curated data, digitisation, metadata, rights and preservation.

Transformation

Experimentation is the critical core of the Lab's process. Insights about how to transform tools into operational services are demonstrated. It shows that experimentation can prepare the organisational culture and services for transformation. There is an examination of funding and the advantages and disadvantages of various models through discussion of the different mechanisms and options that an organisation can apply to Lab set-ups.

Funding and Sustainability

We share insights on how to plan for a Lab's sustainability as well as a step-by-step guide for when an organisation is retiring or decommissioning a Lab.

Labs have a pivotal role in the transformation of GLAMs and the book highlights the critical importance of Labs in changing the future of digital cultural heritage.

Introducing GLAM Labs

Cultural heritage institutions need a digital shift. Galleries, Libraries, Archives and Museums (GLAM) Labs will make that shift happen. GLAM Labs come in a variety of shapes and sizes. They use experimental methods to make cultural heritage collections available in innovative, engaging and unexpected ways. Operating at the intersection of digital cultural heritage, innovation, technology and creativity, they provide significant benefit for organisations, users, society and culture.

Defining a Lab

Throw away your preconceptions about what a Lab is and imagine something different.

In a GLAM Lab, there are digital maps, photographs and manuscripts, 3D virtual objects of Egyptian heads and vases, digitised books from the 17th century with pictures of strange animals, sound recordings of machines and violin music, old TV programmes, millions of pages of text from newspapers, video games from the 1980s, websites which no longer exist, and computer programs which worked on machines that no one makes any more. There are people coming in and out; to chat, to tinker, to transform, and to share.

Cultural heritage organisations have historically provided access to and preserved cultural heritage. The shift towards the digital has presented new opportunities for experimentation and innovation. The fast pace of technological developments impacts society and culture worldwide. Some institutions may not be ready for this. This is the world of GLAM Labs. Labs and Lab-style work challenge the traditional approach and use new, existing and emerging technologies to make their collections available in innovative, engaging and unexpected ways. Labs experiment, collaborate, take risks, sometimes fail, and always push boundaries.

GLAM Labs history

Early Labs appeared in the USA and were quickly followed by the establishment of cultural heritage Labs in Europe and Australasia, and they are continuing to spread across the globe. One of the first was New York Public Library Labs, 'an unlikely crew of artists, hackers and liberal arts refugees', which has influenced the work of many current Labs. 'Given a strong directive to experiment, but with minimal access to the New York Public Library (NYPL) digital infrastructure (and without any remit to digitise new collections),

NYPL Labs operated at the forefront of innovation in digital cultural heritage' (Vershbow, 2013).

Another great example from the museum community were the Cooper Hewitt Labs at Cooper Hewitt Smithsonian Design Museum in New York. Set up by Seb Chan, Director of Digital and Emerging Media, and his team, they wanted to imbue digital transformation across the museum during the renovation of the building. The museum decided to increase the digital activities of the organisation and to find new and innovative ways for the audience to get access to, find, research and enjoy the collection. Cooper Hewitt Labs was not a dedicated team as such but rather a digital team that did Labs work as well as their daily jobs.

The influence of these pioneers in the Labs community continues to provide inspiration and learning opportunities. Labs are collaborative places that explore ideas and provide opportunities for creative technologists, artists, researchers, universities, schools and communities to work with people who are interested in using digital collections, for example, through fellowships, grant programmes and placements.

Added value of GLAM Labs

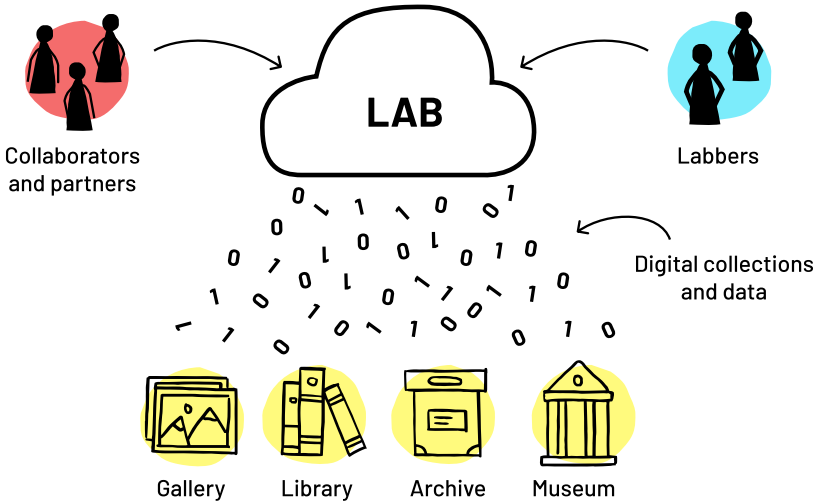
Regardless of whether a Lab exists purely online or also has a physical space to operate in, all Labs provide experimental ways of working that seek to expose organisational gaps and challenges. They are the glue that brings institutions, technology, people and brings communities together. Information Technology (IT) and web teams that build and maintain the organisation's websites, services and infrastructure generally don't have the resources or time to work in a Lab-style manner.

Operating at the intersection of digital cultural heritage, innovation, technology and creativity, Labs provide the skunkworks (Nowviskie, 2013) within an organisation (an experimental laboratory or department of an institution, typically smaller than and independent of its main research division). This isn't to say Labs don't use or

integrate existing services, collections and institutional knowledge: they do. They take elements of existing core services, knowledge, skill and engagement practices, such as digitisation, collections, exhibitions and communities, and pivot and reimagine their collective relevance to collaborators and audiences.

Types of Labs working in cultural heritage

There are different ways in which Labs have developed and the style in which they work.



Types of Labs

National and State-based Library Labs

Some national and state-based libraries have adopted Labs. They focus on in-house and partner-led experimentation with collections and public engagement, as well as technical support and advice for users. With a broad outlook, these Library Labs (as is shown below) create opportunities to engage with communities which may not be serviced by traditional services, such as researchers using data collections, creative technologists, artists and entrepreneurs.

Example: KB Lab, Netherlands

The KB National Library of the Netherlands set up the KB Lab in 2014. The Lab hosts tools, datasets and a researcher-in-residence programme where the Lab team collaborates with early career researchers.

University Library Labs

Located within universities, these Labs have a pre-defined audience, focusing on the teaching, learning and research community, and encouraging the use of and engagement with the collections in courses and longer-term projects. The Labs in the university libraries are built to open up and reuse cultural heritage collections and data in an innovative and creative manner. Such Labs increase the opportunities to captilise on emerging trends in faculty teaching and student learning. They may also benefit from existing infrastructure and engagement activity around open access and open data, and complement or encompass makerspace-type activities within libraries.

Makerspaces are primarily hands-on creative spaces where users can experience technologies such as Virtual Reality (VR) or produce creative outputs such as 3D modelling and printing. Organising events and bringing together university library teams is essential to sharing expertise, lessons learned and projects achieved. Those teams need to iterate and enhance the learning and teaching visions and missions effectively through their Labs. The following is an example of a university library Lab.

Example: Lab service, Glucksman Library, University of Limerick
The Glucksman Library at the University of Limerick provides a Lab service. Included as part of a major building extension project concluded in 2018, the Glucksman Library opened up a physically based Lab built around collaborative spaces, highly specialised computers for working with collections and research data, and a large-scale data visualisation Lab. The Lab provides both a teaching function for post-graduates and researchers and a dedicated space for creativity and innovation. The Library Lab supports the strategic aims of the university around digital transformation and entrepreneurship.

Museum or Gallery Labs

Museum or Gallery Labs exist within a variety of museum and gallery settings. Art, science and history museums are all grappling with cultural shifts towards experience and engagement, both online and in their physical spaces. Museum or Gallery Labs look to bring together design, technology, culture and research to transform how stories are told and how collections are conceived and used, both internally and with the communities they serve. Indeed, within the museum sector worldwide there is a strong decolonisation movement that is quickly becoming core to Labs work. Dedicated thought, experimentation and collaboration around decolonising digital (and consequently physical) collections is redefining institutional relationships with communities and helps galleries and museums to find new community relevance and pathways for mutual understanding. For instance, the North Terrace Cultural Precinct Innovation Lab (South Australia (SA) GLAM Lab) operates within a museum.

Example: North Terrace Cultural Precinct Innovation Lab

North Terrace Cultural Precinct Innovation Lab (SA GLAM Lab) is a new cultural heritage Lab that brings together four state government-funded South Australian institutions; the History Trust of South Australia, the South Australian Museum, the State Library of South Australia and the Art Gallery of South Australia, establishing a South Australian centre for excellence in digital cultural heritage and effecting digital and cultural transformation across the city's cultural precinct. The Lab is an interdisciplinary collaborative space where all four institutions share knowledge, resources, skills and expertise to advance new cultural, audience and research practices, as well as access to and experimentation with digital collections.

Archival Labs

Archives are as yet under-represented in the GLAM Labs space in comparison with their library and museum counterparts. This could be related to a number of issues, such as the hierarchical complexity of archival records and the limited amount of digitised content. A Lab-like initiative is the emerging transdisciplinary field of Computational Archival Science which the University of Maryland, College of Information Studies defines as 'the application of computational methods and resources to large-scale records&nbps;/&nbps;archives'. An example of an archival Lab is shown below.

Example: Digital Lab, The National Archives, United Kingdom (UK)

The UK National Archive's Business Strategy, *Archives Inspire*, defines the strategic goal of becoming 'a digital archive by instinct and design'.

The National Archives' Digital Lab is a dedicated environment for experimentation. It is a place that enables innovative, interdisciplinary and collaborative research. 'A safe space to do dangerous things'.

Individual Labbers

It is important to note that GLAM innovation doesn't just happen inside institutions. Some of the biggest influences on the way in Labs have developed their work and practice has been through dedicated and passionate individuals (such as the historian in the example below) who do Lab-style work. They saw the need for institutional transformation early and their activities are focused on new modes of storytelling, engagement and exposing gaps.

Example: Tim Sherratt

Tim Sherratt is a self-described historian and hacker, who researches what is possible with cultural heritage collections and politics. Tim builds online experiences using collections. He has been one of the early adopters of using technology to find new ways of working, and then gifting that back to others through his expansive sharing of knowledge and code, building of tools and visualisation methods. Tim has been a big inspiration to many peers in the sector, especially to people setting up a Lab.

Benefits of a Lab

Deciding why an institution needs a Lab is a crucial process. Firstly, it is important to think about what the Lab can bring to the organisation and how it benefits the community. This chapter describes possible gains for the organisation and society. This is not a one-size-fits-all approach and the following is not designed to be comprehensive. So, where do you start and why?

Benefits to the organisation

Accelerate change within the organisation

Labs advance and can influence change within institutions through creativity and innovation. Labs transform the organisation's operations and lead to new thinking about the many roles within the institution and the function of the institution itself. As such, Labs are a way to accelerate change within the organisation. By working at the forefront of technologies and digital cultural heritage, Labs generate new learning for the institution, take risks. With this can come innovation and the ability to change the way in which an organisation works, introducing new skills and knowledge to improve existing services.

Collaborative opportunities

Within cultural heritage organisations, Labs promote collaboration within the institution by drawing upon existing expertise around collections, access, and metadata. This promotes learning throughout the organisation and enables transfer of ideas.

Labs expand and deepen partnerships with other organisations, bringing together collections and expertise. Furthermore, the activity of Labs in sectors which may not always be serviced by traditional cultural heritage organisational services, such as artists, entrepreneurs and creators, can lead to new cross-sector collaborations.

Skills development

By applying new technologies, Labs encourage the development of new skills. Neudecker (2018) writes that Labs foster 'development of internal staff, fostering digital skills and generally creat[e] more engagement with digital collections across the whole organisation'.

As collections are made available as data, new skills are needed to manipulate, use and enhance them. This encourages the adoption of skills such as computer programming, data cleaning and data manipulation — all of which are relevant to cultural heritage organisations. Staff who are exposed to new ways of working in Labs learn new skills that can make their work easier. These skills can then transfer back to their department and role, and influence the way in which they work.

Costs

Labs can rapidly prototype and test emerging technology and processes at a much smaller scale and cost. This research can ultimately lead to a large cost-saving exercise for an organisation, as a proof of concept is easily developed and tested.

Maintaining relevance

As technologies rapidly change, cultural heritage organisations need to adapt to remain relevant. Labs help their organisations in this task. The new approaches that are tested and take hold in the Lab facilitate adoption of innovative and modern tools and methods for content delivery and user engagement.

Benefits to the users

New ways to use and share collections

By making collections available in new forms, and often at scale, Labs encourage novel engagement with cultural heritage organisations' collections. Furthermore, as advocates of open licensing and open data, Labs enable and advance the reuse of cultural heritage data, which was previously not possible. This provides opportunities for

cultural heritage collections in a variety of contexts, including to advance research, for commercial use, to offer new insights, to create new artistic interpretation, or simply for enjoyment.

Insights into cultural heritage organisations

By making collections available in machine-readable formats, Labs encourage and enable analysis of collections, offering new insights for organisations and users, a deeper understanding of which collections organisations hold and why this is the case. Through Lab research, organisations can adapt their purchase strategies based on usage statistics. Furthermore, data visualisations can throw a new lens on collections to help generate new research questions.

Career development

Lab opportunities such as scholarships, grants, fellowships, internships and drop-in programmes have proven their value through the development of careers. By having an opportunity to collaborate with the Lab, develop and produce a prototype of an idea at a smaller scale, researchers and creative technologists can demonstrate to future employers and collaborators what they are able to achieve.

Benefits to society and culture

Cultural heritage institutions are gateways to culture — but questions of whose culture, and how this is framed, are problematic. In making collections available as data and engaging diverse audiences, Labs can present uncomfortable truths about the diversity, or the lack thereof, within (Western) cultural heritage organisation collections. Historical collection policies can be highlighted — and crucially, challenged — by the work of Labs and Labs users, promoting greater transparency about the role of collecting strategies for cultural heritage organisations and encouraging and focusing efforts to address issues such as inherent biases which arise from this.

Where Indigenous cultures have been colonised, the result of digitisation has been the continued colonisation of their cultural

heritage by these organisations. Labs work in the space of decolonisation and are acutely aware of the need to prevent recolonising the digital space when it comes to representing Indigenous digital heritage. Through experimentation and engagement, Labs can redefine how institutions work with communities represented in and by their collections, to seek diverse collaborations to reimagine how their stories are told, how cultural heritage ownership is conceived and to create new pathways for mutual understanding.

Key points

GLAM Labs are:

- Instrumental for effecting the digital shift in cultural heritage institutions by challenging traditional approaches.
- Bringing institutions, technology, people and communities together through experimental ways of working.
- Based in a variety of cultural heritage institutions including national and state-based libraries, university galleries, libraries, archives and museums.
- Operating at the intersection of digital cultural heritage, innovation, technology and creativity, Labs benefit organisations, users, society and culture.

Building a GLAM Lab

Is there such a thing as the perfect Lab? No two Labs are built the same way, but some essential first steps can be beneficial to all. Formulating values is an important early step for Labs and this chapter helps generate ideas on how to do this. It also advocates for defining design principles for Labs as a way of working in an experimental environment and suggests tips on positioning and starting a Lab.

Values

There is no such thing as the perfect Lab, and none of the authors of this book have created or will ever create one either. But being bold and courageous is the first step towards a Lab. Once you decide to set up a Lab, don't be constrained by focusing on the institutional reality within which it will operate. Permitting institutional, situational or financial circumstances to obstruct blue-sky thinking inherently constrains the aims and potential impact of a Lab.

Thinking big: Formulating your values

Formulating core values is an important and evolving step in implementing a Lab vision and may take some time. Values need to be flexible enough to evolve as the Lab evolves. They can be a guiding beacon and should help light the way to the type of cultural institution you hope to create. Thoughtful values can help sustain a team through tricky situations and help show the way forward. Setting aspirational values for the Lab and sharing them helps identify challenges; experiment with new ways of working and negotiate competing priorities. They are a crucial reference point when talking about the purpose and benefit of a Lab and are useful in prioritising projects, services and resource allocation.

Below are some values that could be relevant. Each Lab will need to find the values that resonate for the team and institution, and their communities:

- **Radical openness** is a way of behaving as well as a state of mind. It's about sharing, exposing gaps and pushing boundaries, without 'fear or favour'.
- **Transparency** of process, of decision-making and of practice in Labs engenders trust and wins institutional allies.

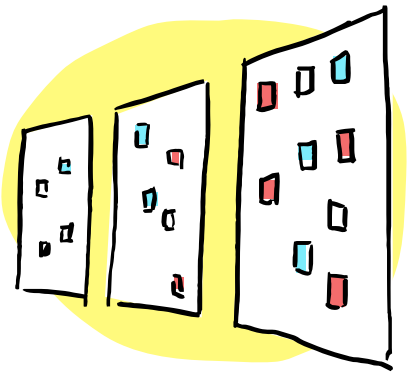
- **Experimenting** in Labs enables creativity and innovation. Thinking differently develops team and organisational skills and resilience.
- **Collaboration** is key. Collaborate within the Lab, within the organisation, with stakeholders, partners, and of course with users.
- **Creativity**. Be creative. Play with the collections. Think outside the box. Ask questions. Explore new ways of arriving at answers.
- **Inclusive**. Be inclusive and create a safe environment for multiple voices.
- **Boldness**. Labs offer a space for formalised disobedience and this necessitates being bold.
- **Ethical**. Labs push boundaries and that should be embraced in an ethical framework.
- **Accessible**. Labs ensure that data and collections are understandable to humans and machines and should therefore consider modes of accessibility.

To see how values might be implemented and communicated, examples of this are shared below.

Example of values:
- **Digital Strategy, Library of Congress** (LC): Throw open the treasure chest. Connect. Invest in our future.
- **Manifesto, ÖNB Labs**: Sharing is our core principle. Favour quality over quantity. Let's tell good stories.
- **Values, KB Labs**: We're open, we experiment, we connect. We learn.
- **Values, DX Lab**: Collaborate. Experiment. Create. Engage. Be Open. Surprise.

Designing a Lab

Design principles help Labs to direct and define their work. They should reflect on the reasons a Lab has been set up, how it can be useful to the staff, and help to communicate why things are done in certain ways. It is important to find the best method for the Lab to function and work together with other staff. Using a human-centred design approach (design thinking, user experience methodology) can work well for teams, but it can take time to find the right method that suits Labs and the organisation. The **Agile methodology** is often used by digital teams. Following a prescribed Agile method may work for some Labs and not work for others. It takes time to get the design process up and running and to get the organisation and the staff comfortable with a new approach. The illustration below shows the use of notes in a brainstorming session.



Sticky notes, grouped and analysed: brainstorming, prototyping, and designing session

Labs work is defined by constant prototyping, allowing the design outcomes to shift and change depending on what is discovered. This can be challenging for staff who like to know the end-game before the start of any project. Labs exist to challenge, test, find and develop new ways to gain access to collections, data and experiences. Labs need to have the space to do this and do it with confidence; knowing that if they fail or end up down an unexpected path, these are ok. Setting out design principles can help with this. Therefore, it can be important to define the design principles of Labs and have that communicated.

Establishing design principles

Defining flexible and responsive design principles will be important as they are something that Labs can refer to when required. Design principles will help to define the way the Lab thinks about itself and the way it works and engages with internal staff, external contractors and creators, as well as audiences. They shape the outcomes of any experiment&nbps;/&nbps;project and can remind the organisation of why the Lab exists and what it is there to achieve. Design principles should be clear and concise, reflect the work that needs to come out of the Lab, and be a manifesto for how the Lab works. Communicating your principles internally and externally builds awareness and community. Be open to changing and modifying the design practice over time.

Setting up the design practice for Labs in a cultural heritage organisation will depend on many aspects and will be different for each one. Things to consider include:

- Skills within the organisation.
- Size of the organisation.
- Appetite for working in an experimental way and taking risks.
- Consider online only versus online and in-gallery (in a physical space).

Labs need the support of the organisation and the staff in the work that they achieve. It can be challenging, especially for smaller Lab teams which need to gain additional skills support from staff, researchers, partners and creatives to help them achieve their goals. Getting staff involved from the beginning, when Labs are being set up, has many benefits. It gives the organisational staff a chance to communicate their ideas about the way in which the Lab may work and the kind of research and development that they may undertake.

Design principles toolkit

Based on the setup of the organisation, one of the following options can act as a guideline to define design principles.

If no vision statement is present:

1. Plan how you want to model your Lab.
2. Start with keywords.
3. Explain&nbps;/&nbps;define the keywords.
4. Talk to your team and staff about it.
5. Re-evaluate what you have created.
6. Expand the principles to your organisation.

If the parent organisation has a vision statement:

1. Consult widely with the staff from the organisation.
2. Pick up keywords from the meeting.
3. Explain and define the vision.
4. Formulate your principles.
5. Re-evaluate the principles with your team.
6. Expand it within your organisation.

Collaborative design principles

Running a collaborative workshop at the start of setting up a Lab is one way to achieve putting the design principles together. This approach can be used to host several drop-in sessions for interested staff over a period of time. A drop-in session might include the following elements:

- Looking at work of peers, including outside of the sector such as online shopping, banking or the music industry.
- Ask staff to bring one example of an experience that they love and get them to present it and talk about why they chose it. This does not have to be digital. It will provide an open opportunity to talk about possible design principles used for each case.
- Make a presentation on what other cultural heritage Labs are doing and what they have achieved or failed at, then discuss.
- Get to the truth of what the staff really think the organisation needs in terms of an experimental, Research and Development (R&D) approach to certain ideas, areas and what they would like the Lab to focus on for the first year.
- Ask the staff to write down one design principle they think is important to them that the Lab could adopt.

After the drop-in sessions the next steps are important:

- Collate all design principles from all staff to refine them.
- Discuss and review each one of them.
- Align them to the organisation's strategic plan.
- Communicate them back to the staff.
- Test the final principles.
- Agree on the design principles.

Review the design principles for each project / experiment that the Lab undertakes and ask whether the proposed project is addressing these principles. They should be high level and help to guide the Lab forward. Some projects may not always cover all of the design principles, a project may just use one of them for some things and that is ok.

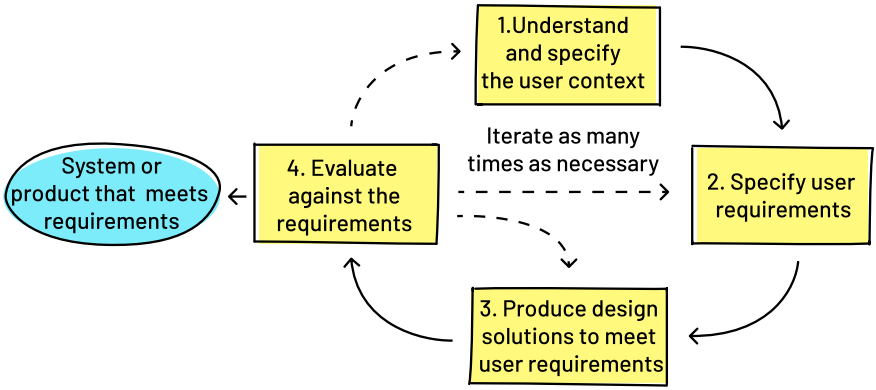
Examples

This is a non-exhaustive list of design principles for guidance:

- Audience first: know your users, do it because it matters or there is a need, not because it is shiny.
- Design creatively: with data and partners.
- Don't overbake: it is important to prototype and test your products with users as soon as possible, don't overcomplicate.
- Innovate: embrace experimentation and ask why things are done in a certain way.
- Iterate: digital innovation isn't the same as producing an exhibition or a publication. Digital products, services, collections and experiences are not static outputs. Refine your offerings as you learn from your users.
- Build digital experiences - be adventurous.
- Be open: it is important to give back to the sector.
- Constant prototyping.
- Embrace risk: being the first to try new things always contains elements of risk. The gains can be great, but there is also learning to be had in failing.
- Collaborate: sharing knowledge and resources can only benefit Labs and organisations. Promoting a culture of openness and generosity is important to the success of Labs.

Design Process

After selecting your design principles, move into the designing phase. Human-centred design, design thinking or user-centred design, is a design approach which considers user needs before designing a service or a product and throughout the subsequent stages of production. Design for people first, not technology. It is vital to make sure that user research is done. Use a method which summarises knowledge from multiple sources. This could include the development of typical users' personas. These are not based on a fictional combination of ideas about a user but need to be grounded in extensive research on groups of users represented by the persona. Additionally, scenarios can be used to describe a typical sequence of actions and actors for a specific task. One possible design process flow is illustrated below.



The user-centred design process (adapted from ISO 9241-210:2019)

The process includes evaluation of the final design. This can be done with different methodologies, such as observation, focus groups and

surveys, and should always involve users. Ideally the group of users involved in the evaluation differs from the group with which the requirements were developed. However, if there is a specific user community which 'owns' the project, the evaluation may be done by the same people who contributed to the identification of needs. The outcome of the evaluation may confirm that the design is consistent with the user requirements, but this is not always the case. The designed solution then needs to be reworked, or the user requirements should be recaptured. The pace of technological change means no solution is final — for continuous use, the design needs periodic review.

Participatory design

A popular version of the human-centred design process is participatory design integrating communities into the design process thereby giving them an active role in the various stages of concept, design and implementation. Identifying active representatives from a relevant community of users, such as Indigenous communities is crucial. It is important to bring their voices and opinions to the development of experiences / products so as to better serve these communities in a respectful way. This is important to ensure that collections, experiences and services are diverse.

'*If people don't see themselves as part of your work, they won't see your work as an essential part of their lives*' **OF/BY/FOR/ALL**

There are different ways in which you can include your community&nbps;/&nbps;users into the design approach, such as:

- Invite your community to initiate a concept for a design.
- Ask them to create content and experiences.
- Discuss how they imagine the product/experience and ideal user personas should look.
- Provide feedback on mock-ups.

- Discuss final look and feel.
- Assess specific functionality.
- Discuss expectations on final designs and outcomes.
- Contribute to any policies which define aspects related to the user participation.
- Contribute to the documentation of the experience / product.

Participatory design is addressed in the following example from the DX Lab.

Example: #NewSelfWales, DX Lab

#NewSelfWales was an exhibition to create a gallery of community generated photos, uploaded from a photo booth in the gallery or via Instagram. DX Lab used a design process to establish design principles and vision, identifying how the exhibition space was to be used, considered opportunities and challenges for users, and iteratively refined and tested.

Realising a Lab

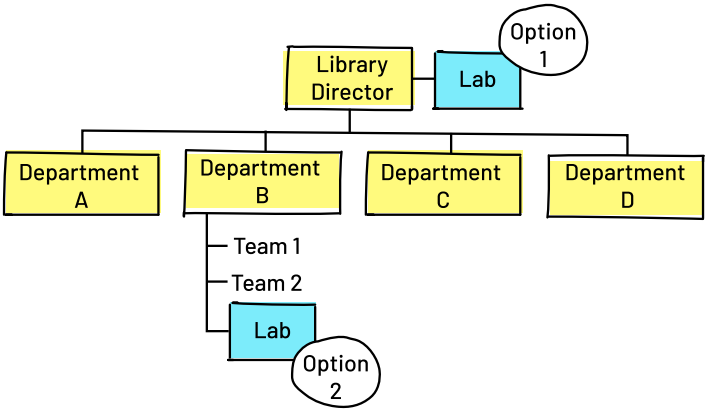
Now that the values and design principles of the Lab are defined, it is time to make the Lab a reality. This is an ongoing process that is covered in detail throughout the book. However, this section covers some building blocks to consider before launching, and that can help to get the Lab up and running.

Positioning within the organisation

Positioning can refer to Lab offices, and also to the location within the organisational structure. Ideally a Lab is an independent team within the parent institution, but this does not mean it cannot be integrated with the organisation. Here are two options of Lab locations in an organisational structure:

Top of the organisational chart

Placing a Lab high in the organisation facilitates quick communication to the management team and provides a certain amount of freedom as the Lab may or may not be concerned with institutional politics. If the Lab team consider themselves outside institutional politics, this might lead to the Lab being detached from other departments, making it difficult to integrate Lab outcomes into the institution.



Two options for positioning the Lab in the organisational structure

Within a department

If a Lab is placed within a department, it should be positioned where it has the best connections to internal partners. Think of, for instance, Research Services, the Collections Department, the IT Department or Public Engagement. Embedding the Lab within the organisation facilitates a good flow of information and innovation into the organisation but can require a longer planning period to create room in the organisational structure. It also makes the Lab less agile as it might be placed under several management layers.

These are the two mostly commonly encountered options, but naturally others can exist.

Selecting a Lab office

The Lab team should be working from an office where they have easy access to the people they will be collaborating with outside of their unit. Sharing amenities such as a coffee machine and break room

with internal partners facilitates integration of the Lab and team into the organisation. Think about where external partners can be welcomed to the Lab, for example, security measures necessary for welcoming students and researchers for events or consultations. Beware of locating the Lab office in a remote area of the building or even in a separate location, as this adds an additional barrier to inter-departmental communication. Possibilities for Lab locations are explored in the next two examples.

Example: The Lab at the Glucksman Library, University of Limerick, Ireland
The Lab is situated in the public space of the library, ensuring all students and staff can drop in. Within this space, the Lab team has an office near the Lab which is accessible to any partners.

Example: KBR Digital Research Lab, Royal Library of Belgium
As the KBR Digital Research Lab is the result of long-term cooperation between KBR (Royal Library of Belgium) and the Ghent Centre for Digital Humanities (GhentCDH) the Lab Researcher will be employed by two organisations located in different cities. Where the KBR Labs Office(s) will be physically located will be an interesting question to explore.

Creating the Lab's identity

A Lab's identity represents its values but should also be connected to the parent organisation. Finding a name, creating a look and feel, and a logo — in short, developing a recognisable brand for the Lab that reflects its direction, approach and perspective, shapes the identity and positions the Lab within the organisation's branding ecosystem. A recognisable brand that echoes the message of the Lab will help inspire staff and potential collaborators and funders, an example of which can be found below.

Example: Logo, ÖNB Labs

The ÖNB Labs uses the inverted logo of the Austrian National Library as their brand. This originated from the crowdsourcing initiative of the library and was designed by Paul Sommersguter. The inversion is based on the idea to focus on the input of the general public to the library and as such visualise participative initiatives of the institution.

Consistent use of the Lab's identity in all communication channels helps with brand recognition. This involves selecting a domain name for the website (essential for a Lab), email addresses, social media handles, etc. Also crucial is how they relate to the parent organisation's institutional online presence, as shown in these examples.

Example: Labs domain names

https://labs.onb.ac.at | **http://labs.kb.dk/** | **https://dxlab.sl.nsw.gov.au/**

Impact

Once the Lab has defined its values and principles, is positioned within the organisation and has its own brand, it is time to think about the impact that the Lab wants to make. Demonstrating impact and value is imprecise, but the topic is a common discussion in cultural heritage organisations. It therefore makes sense to design for impact. Internationally, the use of language around the value of culture and numbers is problematic, so it is important to be clear about what a Lab wants to do and why.

Measuring impact

Impact can take a multitude of forms. This could include qualitative metrics around value or prestige, social and economic impact,

audience impact (engagement or user satisfaction) and organisational impact (such as departmental and procedural transformation). Quantitative measures around access to and uses of collections, tools, services and Application Programming Interfaces (APIs), and the volume of projects or Lab outputs can be easier to measure.

It is also possible to measure savings from producing low-cost and rapid prototyping solutions before rolling out a tool or service at scale. Additionally, a Lab can track cost savings when an approach is not continued after a pilot or when Labs retire or shut down a tool or service. There are a multitude of other impact indicators, many of them being qualitative, such as user satisfaction or the impact it has on the career of researcher. These are more difficult to capture but they can be significant.

Evaluation

Evaluating the impact of Lab work serves multiple purposes and the rationale for evaluation will help determine the methods and outputs used. Evaluation provides vital information about the usefulness of products and services to users which in turn helps Labs make better resourcing, design and development decisions. Evaluation can provide numbers and qualitative impact metrics, it can demonstrate the value of a Lab to stakeholders and finally, it can support Lab teams by recognising the value of their work.

Just as Labs measure and evaluate many different types of impact, they also use many different tools and techniques to do so. Tools for straightforward data and user metrics are plentiful and often freely available, such as Google Analytics. More sophisticated tools for measuring social, artistic or economic impact exist, such as the **Europeana Impact Playbook**. It should be noted that some of these tools may require specific skills and thoughtful use. If these free options are not sufficient, organisations may need to invest in particular software, skills, partnerships or consultants for impact evaluation.

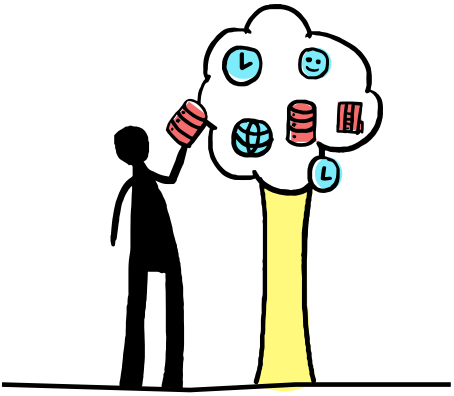
Example: Impact Evaluation, British Library (BL) Labs Projects
BL Labs conducted two independent evaluations in 2013 and 2016, both were initiated midway through both phases of the projects. They were used to provide evidence of the impact of each phase of the project and the reasons why it would be necessary to secure further funding for the next round of the project. The methodology involved interviews of internal and external stakeholders, case studies, and questionnaires. One of the major takeaways was that the British Library's digital infrastructure was not ready for computational research at scale for many of its digital collections on-site. **Evaluation summaries and tools** used for both pieces of work are available for reuse and contextualising to each individual organisation.

First activities

Once the Lab knows what it is and where it wants to go, it can be helpful to identify fast, easy and cost-effective activities to start with. Examples of some of these quick wins include:

- Uploading public domain data to an open platform such as Zenodo or Archive.org.
- Establishing a web page with a list of available collections, Lab people to contact, and create a general e-mail address for enquiries.
- Establishing a social media presence.
- Introducing Lab (virtual) office hours where users can talk to a Lab team member.
- Encouraging staff to expand their skills by doing open tutorials available such as Library Carpentry and Programming Historian.
- Applying to existing technical infrastructures for research projects to provide computational power for a Lab.

- Develop an elevator pitch to share the Lab's story when needed. See below for tips on how to do this.



Start with the low-hanging fruit

Elevator Pitch

Having an elevator pitch ready to explain the purpose and identity of the Lab to staff, external users, funders, and the wider professional community is essential. Practising and perfecting a concise speech helps to **tell the story** of the Lab, especially to executives and others with limited time.

Having key facts about the Labs project ready and prepared makes it easy to convey important information succinctly. Doing so frees up time to connect with the conversation partner — asking about their work, things they're passionate about, like special collections or projects. It can be helpful to start the conversation with a question, and to close it with an invitation, to establish an ongoing dialogue.

The key facts could include some of these elements:

- Vision and mission of the Lab and how it contributes to the institution's vision.
- Why now is the time to have a Lab.
- Numbers detailing your Lab, like staff numbers, funding, projects, timeframe.
- Concrete examples of success stories.

Making the story positive and attaching it to the overall narrative of digital services or digital innovation at the institution is helpful, as the next example shows.

Example elevator pitch: Key facts about British Library (BL) Labs
Since its launch six years ago, it have supported over 160 cool projects using the library's digital collections and data. Four large-scale artworks that its partner David Normal created using a freely reusable digital image collection created by BL Labs was exhibited first at Burning Man in 2014, which was attended by 50,000 people. Subsequently they brought the art works to the British Library and installed them outside in our piazza for everyone to enjoy. Mission statement: BL Labs promotes, inspires, and supports the use of the Library's digital collections and data.

Key points

Building a GLAM Lab involves:

- Defining core values to guide future work.
- Fostering a culture that is open, transparent, generous, collaborative, creative, inclusive, bold and brave, ethical, accessible and encourages a mindset of exploration.
- Grounding the Lab in user-centred and participatory design processes.
- Being able to communicate clearly what the Lab is about.
- Establishing quick wins to get up and running.
- Finding tangible ways to define and measure value.
- Influencing and possibly redefining institutional evaluation metrics to advance the Lab's core vision and values.

GLAM Lab Teams

There is no Lab without people. This chapter discusses the qualities to look for in the Labs team and how to go about finding allies within and outside the institution. Furthermore, it offers ideas on how to create a nurturing environment for teams to thrive in.

Forming the Lab team

The crucial components when forming a Lab team are the right set of knowledge, abilities, skills and structure in the team. These are, however, the most elusive to define and locate. Lab teams need to know about GLAM collections, be familiar with, and curious about, current technologies. They should be aware of legal issues, have communication and outreach skills, and the ability to get things done. Lab members need stamina, passion, they need to be flexible and to see possibilities.

Skills

A Lab team has to build bridges between collections and IT staff, so diplomacy and patience are required. A Lab team has to figure out how to complete tasks in complex bureaucracies. This requires ingenuity and the ability to work at different paces. Lab teams need to encourage their colleagues to work outside their comfort zones, requiring powers of persuasion and the ability to absorb risk. The work can be both invisible and high profile, and it requires high levels of collaboration and the ability to be self-directed. Lab teams play a central role in moving their institution through its digital transformation, so looking for the ideal combination of skills for the Lab contributes to its success.

Composition

There is no ideal team size or composition. The number of team members and their competencies will depend on the ambitions of the Lab, its vision and the context in which they live. Job titles vary. Some examples are: manager, innovation specialist, digital heritage specialist, digital curator, developer, advisor, and user experience specialist. Ideally, the mix of knowledge, skills and abilities complement each other.

Culture

Establishing a healthy and flexible culture is essential for a well-functioning Lab. The work can change from day to day and the scope can be as narrow as cleaning a dataset and as broad as being responsible for an organisation's digital transformation. Having a team that is able to work at all levels of the institution and able to manage complex relationships is key. Being clear about the goals, values, and norms of the Lab helps staff navigate their way forward and it helps new colleagues and your collaborators know what to expect. As shown below, LC Labs has its own manual.

Example: Library of Congress, LC Labs Manual
Inspired by Labs in other sectors, Kate Zwaard, Director of Digital Strategy and Chief of the the LC Labs team, created a manual that captures the culture and values of the team so that new members and their partners have a common starting point.

Setting up a team

There is no one-size-fits-all approach for setting up a team, though there are several successful models, each based on the realities of the institutional context. Resources and budgets will most likely determine team size composition. Labs can operate independently and be embedded across an organisation. Fellows, researchers, interns, and volunteers are often found in Lab teams to augment or contribute to specific projects. Existing staff may launch a Lab, staff may be brought in for the task, or a combination of both.

Team setup

The following examples show the diversity of Lab team setups:

A team with an agile, smaller setup with technical and creative skills is that of the **DX Lab at the State Library of New South Wales in Australia**. It has three staff members, a Lab Leader, a Technical Lead, and a Lab Developer. This Lab team is aimed at collaboration within the

organisation. The team collaborates with visiting scholars, fellows and digital drop-ins.

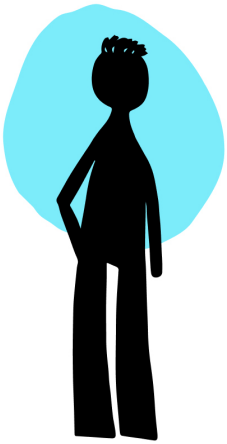
A team where the Lab has core staff, benefits from additionally assigned staff within the institution, and collaborates with external users, is that of the **Library of Congress Labs**. It is managed by the Director of Digital Strategy and currently has a team of four Senior Innovation Specialists and one Innovation Specialist. This core team does not include developers but assigns them from other departments within the institution to work on specific projects. The team also regularly collaborates with visiting scholars, fellows and Innovators-in-Residence who create various experiments.

A team with a complex structure where the entire IT department of the library is involved in developing tools and specialised core staff members from a network close to the users of Lab services is the **KB Tech Labs at the Royal Danish Library**. The Lab is within an institution which is both a national and a university library. The Labs structure is distributed — there are three physical Labs in the Copenhagen University and three further Labs are currently at the planning stage. All these Labs have / will have a core manager. In addition, the IT department of the library has a team of 30 developers who are involved periodically in developing services for the Labs.

Meet a Labber

Here are Questions and answers (Q&A)s with some of this book's Labbers to give an example of people working in a Lab.

Labbers 1: Mahendra Mahey, BL Labs Manager, British Library



What's your background?
I have worked as a teacher of social sciences, English as a Foreign Language and computer science, a community builder in the technology sector, and as a manager in digital technologies in further and higher education.

What skills do you bring?
I am a good manager, a natural networker and community builder.

Why do you want to work in a Lab?
I am absolutely passionate about opening up the British Library's digital collections and data to everyone for interesting, innovative and inspirational projects.

How would you describe your outlook or mindset when working in Labs?
I want to inspire my colleagues about the potential of using our digital collections and technology in ways they may never have thought about before; to effect cultural change within the organisation to become more open and sharing. I especially want to bring new people into the British Library who would never previously have considered working with us.

Labber 2: Kristy Kokegei, Director of Public Engagement, North Terrace Cultural Precinct Innovation Lab

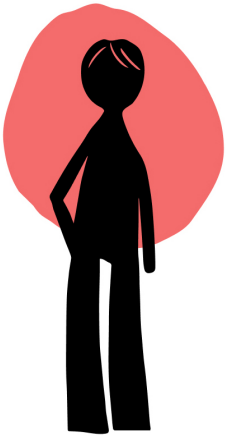
What's your background?
I have a Doctor of Philosophy (PhD) in immigration history and I started in museums as a curator.

What skills do you bring?
I bring engagement skills, research skills, intimate knowledge of museum databases, digital asset management systems, collections and some specific skills around Indigenous data management.

Why do you want to work in a Lab?
I want to work in an innovative space within the Australian cultural sector. I want to push boundaries and open up hierarchical silos.

How would you describe your outlook or mindset when working in Labs?
Passionate and perhaps a bit playful, inclusive. I want to bring everyone along. I want to build a safe experimental space for all the talented creative people within our organisation.

Labber 3: Stefan Karner, Technical Lead ÖNB Labs, Austrian National Library



What's your background?
I'm a computer scientist, but I've also studied jazz vocals and a smattering of humanities for a while. I've worked as a social worker and IT administrator, and as a freelance software developer just before joining the ÖNB Labs.

What skills do you bring?
I consider myself very social and vocal, and I like modelling, designing and building software.

Why do you want to work in a Lab?
I joined because I thought I could contribute my skills to help keeping the library relevant in the 21st century, and work with interesting people while doing it.

How would you describe your outlook or mindset when working in Labs?
Connecting with knowledgeable colleagues and learning about different topics and technologies on a regular basis is really invigorating. Being part of a somewhat disruptive enterprise and trying to effect change in an institution that's perceptibly rooted in the 19th century is challenging though.

Team allies

Locating Lab allies is helpful to the success of any Lab. Labs do not exist in isolation, and community building is a core part of Lab work. For a Lab to have lasting impact, it must be integrated into the organisation and have the support of staff at all levels. Labs are often involved in projects that are new, creative, and innovative. Staff who are not involved or who do not feel involved or consulted can feel left out. It is important to make clear that the Lab's work is complementary to, and builds upon, the work of traditional cultural heritage organisation activity, and both should benefit from one another. Alienating colleagues by making decisions without including key stakeholders or setting up an 'us and them' mentality will leave a Lab without allies. Try to consult as widely as possible with staff and collaborators, make friends along the way, and progress without losing the balance between talking and doing in the context of institutional politics.

Reaching internal stakeholders

Share the message and ethos of the Lab widely. Internal newsletters and existing staff groups are excellent places to start internalising needs and ideas. Internal staff are stakeholders and users of the Lab. Providing opportunities in the Lab explicitly for staff, and a staff research fellowship, or offering temporary placements, acknowledges their contribution and creates advocates. A good example is the **British Library Labs Staff Awards**.

Management

Allies within the organisation's senior management can become key advocates for Lab work. They can help make and support the case for funding, leverage resources within the organisation, promote culture change, and promote the principles of openness and sharing from the top down.

Champions

Champions provide a way of communicating the Lab messages within the organisation. These are useful allies to have in any team, and at any position in the hierarchy in the organisation. Champions are important to locate early on, but it is also useful to continue to seek new ones out as staff turnover and organisational culture changes.

Key areas to establish champions within are:

- Curatorial staff: gateways to the collections, relationships with these colleagues are important to cultivate early. If you can establish a champion within this area, it smooths the process of finding out about available collections.
- Staff with technical skills: these can appear in unlikely places! Skills assessment can help in understanding the technical proficiency staff have. They can be invited to join projects and embed Lab skills within their own teams.
- New recruits: establish a relationship with new staff early, raise awareness of the Lab and the possibility of collaboration.

Expeditors

These people are unblockers. They smooth and speed up processes, solve problems (or get others to solve them), encourage quick (but informed) decisions, and promote productive, efficient working practices. They can exist in any part of your organisation, given that personal relationships are the strength these people offer.

External champions

Influential figures from the research, creative and GLAM sector communities can back the Lab, add weight and recognition. Such champions can lobby within the organisation and ensure that the Lab becomes, and remains, a valued entity. Furthermore, external champions can be brilliant and generous promoters of Lab's projects and activity to the wider world.

The International GLAM Labs Community is a world-wide group of people. Please join! If you want to connect to the International GLAM Labs Community, please visit the website http://glamlabs.io and also register for the mailing list http://www.jiscmail.ac.uk/GLAMLABS.

Letting teams thrive

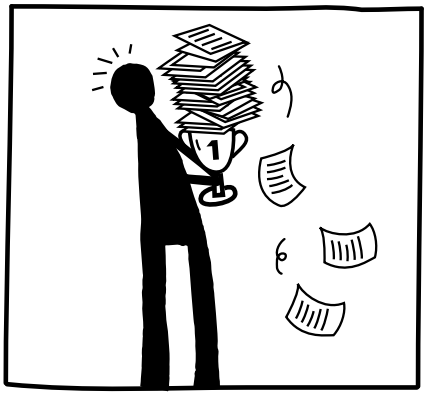
Labs thrive if they are able to create a nurturing environment for all team members and have a number of interconnected elements.

Agency and flexibility

Giving Lab teams freedom to decide on projects and to manage the Lab's budget enhances the flexibility. They can then pursue promising developments in collaboration with users, which improves the sense of agency and responsibility. This in turn enhances job satisfaction.

Recognition

Building institutional structures to ensure that good work is acknowledged is part of a nurturing work environment. Recognition can be intrinsic, taking the form of positive feedback, and extrinsic, such as bonuses. Sometimes a good job is rewarded with more work, as is shown in the diagram below.



Don't reward a Labber by giving them more work

The Labs' achievements are a result of team work and it might be hard to see individual contributions. Recognising the work of the whole team not only celebrates an achievement but also supports the team spirit and emphasises the Labs mindset of sharing.

Culture of failure

Being in an experimental environment naturally leads to taking risks and results cannot be predetermined. Allowing failures and learning from them is an essential part of a positive Lab culture. If an outcome is not what was expected, this does not negate the hard work that went into it, nor the idea that sparked it. The example below, for instance, shows how a failure can result in unexpected outcomes.

Example: Testing emerging technologies, Biblioteca Virtual Miguel de Cervantes
The Labs team decided to apply word embeddings to a corpus of text of the author Miguel de Cervantes. Since the corpus was limited to 20 works, the results were not as rich as expected. However, the knowledge acquired in the process was worth it for other experiments based on conversational agents.

Continuing professional development

Labs are part of a culture of constant change — in technologies, user expectations and scales of digital operations. This inevitably requires investments in continuing professional development of Lab team members. They come from very diverse backgrounds and there is no one-size-fits-all education path for Lab members, but their curiosity is what connects them. The following example includes how the KB Tech Lab allows its developers time to innovate.

Example: Innovation week, Royal Danish Library
Once or twice a year, the IT Department works together for the KB Tech Lab and all developers have a full week to innovate. No business as **usual type work** is allowed, and the management enforces this. The developers tend to choose either to do some self-study (one example: read up on Java 11) or to implement a good idea they have been sitting on. Afterwards, the results are presented internally, developer to developer and also in-house in the form of an open house where all staff are invited. Some results end up on the **KB Tech Lab website**.

Labs apply a combination of approaches which help their staff members develop the desire to learn. These approaches can include:

- **Provide training:** Identifying areas of need and addressing them with in-house training or training provided by third parties. This can for example be done through Library Carpentry.
- **Learn by doing:** A substantial amount of learning in Labs happens through experimentation. Making space for this contributes to the development of skills and knowledge. For example, reserve 20% of the staff's time when allocating workloads.
- **Peer learning:** Not all challenges are new, and peers both within and outside the institutions are a good resource to help solve an issue. Hosting colleagues from other institutions and sending staff members for placements can be beneficial.
- **Labs community learning:** There is an active international GLAM Labs community which regularly organises events and has several communication channels. These channels can be utilised to quickly solve problems by posing a question to them or connecting to a peer. They also provide news on tools, information about new Labs, and other useful pieces of knowledge.

- **Learning from other communities:** Labs can also learn from other communities, such as the research software engineering community.

Key points

GLAM Lab Teams:

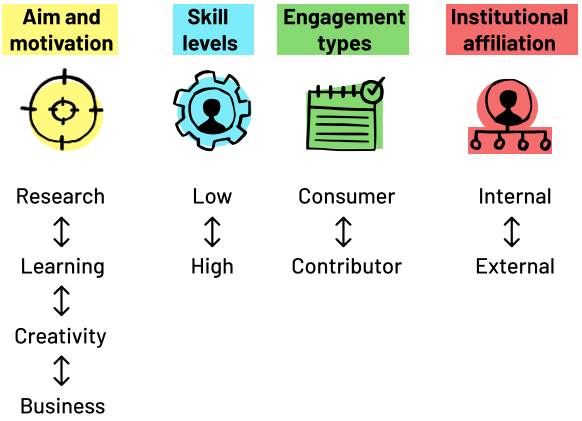
- Have no optimal size or composition, and team members can come from all walks of life.
- Need a nurturing environment and a healthy culture to ensure a well-functioning Lab.
- Might be augmented intermittently by fellows, interns or researchers-in-residence.
- Must be integrated into the organisation and have the support of staff at all levels.

User Communities

User communities are central to Labs. Identifying and understanding them facilitates engagement and collaboration. This chapter discusses existing and potential relationships with users. Rethinking relationships with users and partners can help create clear and targeted messages, tools and services.

Understanding users

Labs engage with a wide audience with varying expectations, needs and digital skills. Thinking about different user groups helps to target and tailor Lab activities; there is no default Lab user.



Lab user groups

Aim and motivation

Users can be grouped based on their main motivation and aims in engaging with the Lab, such as researchers, creatives, learners and entrepreneurs. Further subdivision might be helpful to build services and engagement activities; the needs of a humanities scholar quite possibly differs from that of a cultural startup. Students might need to be engaged differently from PhD researchers.

Skills levels

Different levels of digital skills shape the type of services and activities that are useful to users. Many activities of Labs will address this specifically and facilitate skill building.

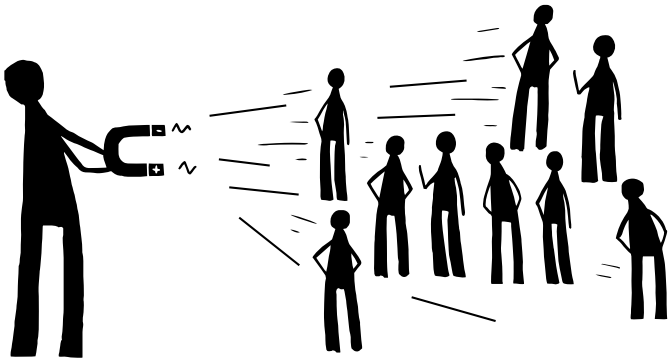
Engagement type

Users can also be grouped according to their engagement type — on the scale from consumers (who are searching for digital resources) to contributors (who contribute to the development of digital content and / or are experimenting with it).

Institutional affiliation

A Lab might also define different levels of support and engagement for external users such as researchers from a specific university, to internal users such as colleagues from other departments.

Targeting a specific user group helps design tools and services matching their needs (as displayed below). Potentially, user studies and evaluation methods can be conducted, as mentioned in the chapter, Designing a Lab.



Attracting users

Engagement

Labs thrive on collaboration and working with a broad range of users allows Labs to reach their potential. It can produce greater outcomes and lead to more opportunities for the Lab and their users. Engaging with users who explore collections, contribute to tools, transcribe or tag documents helps to make and strengthen connections between the Lab, its parent organisation, and the communities it engages. Engagement is not formalised but can lead to more formal partnerships.

Engaging with researchers

Making meaningful connections with user communities can integrate their knowledge, skills, or resources into a Lab. Reciprocal learning is a common outcome, especially when working with universities and research centres.

Example: Royal Danish Library and HumLab
In the spring of 2016, the Royal Danish Library and its **HumLab** invited students and researchers to join a series of data sprints in the exploration of digitised material. While the participants had different skills, most of them came from humanities, fewer had a technical background, and even fewer were from social science. In turn, the library as data providers and curators brought a variety of competencies. The evaluation motivated the library to further develop the **API documentation** and interface. (Laursen et al., 2018).

Engaging with colleagues

Staff from an organisation should also be given the opportunity to use the Lab as a place for experimentation. They have deep knowledge of collections and processes and lots of ideas on how to create positive change. Staff are often key to the success of a Lab. Their expertise can be applied in a Lab to influence different areas of the organisation. Their domain knowledge and network are important to expanding the community.

Engaging with public users

Inviting volunteers into an organisation to offer their energy and expertise to contribute is a powerful engagement mechanism to reach diverse communities. Retirees, school children, history buffs, and other members of the interested public are often engaged through crowdsourcing programmes. These people may not be the traditional user or visitor, but they are often enthusiastic and passionate about the projects, and they make important contributions to institutions.

As Nina Simon writes in her book 'The Participatory Museum' (2010), the power of bringing in the community as partners creates a more dynamic, relevant and essential place in our organisations.

Example: By the People, Library of Congress

By the People is an online volunteer programme at the Library of Congress which invites the public to transcribe hand-written documents. Its primary goal is to engage new audiences. 'By the People' seeks to enhance trust and approachability with users and invite them to contribute their knowledge and skill to the Library (Ferriter, 2019). The transcriptions are created by volunteers and reviewed by them and then returned to the loc.gov website to improve search and discovery.

Engaging with user communities

Developing opportunities for under-represented communities is important and fits well with Lab values of being open and sharing. Inviting these communities to work with Labs honours their expertise and perspectives and gives them a sense of belonging and investment in an organisation and its mission. Ensure the Lab is a safe and welcoming environment.

Outreach

Designing outreach and engagement programmes to engage broad communities of users is important to start a conversation. Users and

partners are sometimes in close proximity, like staff or local researchers, but often a Lab has to go out into the community and design bespoke events and programmes to engage users. Outreach can be as simple as joining a local meet-up or another existing group that meets regularly. Outreach can also be high-profile events with invited speakers and recorded keynotes where big announcements and grand plans are shared and everything in-between, such as data sprints, virtual meetings, training courses, and hack-a-thons.

Example: BL Labs Roadshow
A prime example of an event that connects a Lab and its community is the British Library Labs Roadshows that have been running since **2015**. The Lab team goes out every year, to between 10-20 UK universities to promote the work of BL Labs and its digital collections.

Example: WikiHackatón at Biblioteca Virtual Miguel de Cervantes
Other events are focused on the use of open data to develop innovative tools and services that exploit **Wikidata** and Biblioteca Virtual Miguel de Cervantes dataset as data repositories, such as **WikiHackatón**. The event is organised by the University of Alicante, Wikimedia Spain and Fundación Biblioteca Virtual Miguel de Cervantes. The most recent event brought together 50 people, mainly students of the University of Alicante, where 10 ideas were developed in two days.

Documentation, tutorials and webinars might be generated in events that are later adopted and contribute to the enrichment of other services. Outreach is useful not only to mobilise and disseminate a collection but also to propose innovative projects and to gather feedback. Incentivising participants with awards or prizes can be a great method to encourage the reuse of digital collections in innovative ways. Consider involving multiple partners and users in an event, most have something to contribute. For example, universities can often provide both spaces and expertise. Strategic outreach programmes with set goals, and ways to measure impact help a Lab grow.

This case study shows how BL Labs engages with new users in schools and colleges whilst ensuring keeping in line with the institutional strategy.

Case Study: Labs developing and engaging with new communities for research inspiration and enjoyment, BL Labs, British Library

The British Library tries to demonstrate its continued relevance to users by ensuring all its activities focus through its purposes of Custodianship, Research, Cultural, Artistic, Business, International and Learning. Though our Labs journey started with researchers, this expanded to include new users such as artists, the local community, businesses, international partners and educational providers such as schools and colleges. This evolution was based on a passionate desire that the Library belongs to everyone in the world, but the question was: How did we do this for schools and colleges?

Many of BL Labs' users would never think of coming through the doors of the British Library or even know what the British Library does to engage with schools and colleges. The BL Labs therefore did the following:

1. A pop-up Lab / Library appeared in various locations around the United Kingdom where BL Labs staff promoted competitions, encouraging users to enter awards, develop project proposals and events taking the Library to the users. These sessions debunked myths and offered a set of inspirational stories of how previous users had used our collections and, most importantly, started a conversation which could lead to a meaningful use of our collections. For example, in 2017, Vittoria Primary School won the BL Labs Award for Learning and Teaching by creating a storybook, titled: *World of Stories*. It was developed in collaboration with

children, parents and teachers using British Library digital image collections.

2. Participate in future careers workshops organised at schools targeting 14-16 year olds in London. Here the BL Labs manager talked about his journey to becoming a Labber, what inspires him to do this work every day, raising awareness of what the British Library does, and particularly BL Labs.

3. Organise two-week work placements for 16-year-old school students in the BL Labs. These programmes are designed to match the skills of the children to do *real* work that needed to be done in the Lab, as this is much more motivating than abstract tasks. Activities included writing blog posts, contributing to the BL Labs website, social media channels, editing video interviews and curating smaller datasets from larger ones. Examples include:

- Ruby Dixon curated a collection of digitised books with images about Finland which were used by the Finnish Embassy website to celebrate the 100-year anniversary of the Foundation of Finland.

- Nadya Miryanova worked with the Russian Curator and the same collection of books to find books written in the Russian language.

Collaboration and partnerships

Cultural heritage professionals, be they librarians, archivists or museum curators, are used to engaging with users. These engagements can lead to collaborations and sometimes more formal partnerships.

In her 2012 blogpost **What are some challenges to doing DH in the library?**, Assistant Professor of Digital Humanities, Miriam Posner speaks about 'the complexity of collaborating with faculty' and stresses the importance of being 'attuned to the peculiar dynamics of this kind of relationship'. She emphasises the importance of equity in the relationship between librarians and academic researchers. This tension seems to be based around conflicting needs: libraries want to provide high-quality and comprehensive access to their digitised and increasingly born-digital collections. Humanities researchers need easy access, ideally from their laptop, to digital collections, often from multiple libraries, archives and museums, from which they can iteratively build their digital corpora in response to their specific research questions.

Collaboration can be a complex matter, but most often provides a rich environment where growth happens.

Fellowships, Residencies and Awards

One notable partnership and engagement programme many Labs use is the fellowship or residency. It allows different types of users, like artists, designers, journalists, and researchers, to engage with Lab collections and services. These programmes are a successful way for cultural heritage institutions to reach new audiences. Again, there is no one-size-fits-all approach and the actual design of a fellowship or residency programme depends on funding, availability and organisational commitment. When working with fellows and

residents, a contract is advisable, clarifying IP and licensing, and the terms and conditions of the partnership.

This also applies to different but similar forms of partnerships, such as competitions or awards. A prominent example of a Lab utilising programmes like this is BL Labs, promoting and encouraging digital scholarship by running **awards, competitions and projects**. Categories of awards include research, artistic, entrepreneurial, commercial, learning and teaching, as well as awards for BL staff. The DX Lab offers a slightly different type of grants programme, as discussed below.

Example: Digital Drop-In, DX Lab — State Library of NSW
The DX Lab at the State Library of NSW offers a range of different partnerships from smaller grants, known as the **Digital Drop-In**, through to a Fellowship. The Drop-In is a smaller, lower-cost and faster-paced collaborative partnership that gives people an opportunity to explore an idea, using the Library's collection. They also work with the expert knowledge of staff in other parts of the organisation such as the curators, reading room staff, Indigenous and Learning Services teams.

Commercial partnerships

Commercial partnerships are an endeavour to be approached more cautiously. However, they may serve to bridge a lack of funding and promote an entrepreneurial approach in Lab activities. GLAM institutions also provide opportunities to further develop careers, product ideas and start up ventures for entrepreneurs.

In particular, the collaborations with start-up communities or tech pioneers can be effective partnerships because their way of working aligns with that of the Labs. Both experiment, test, publish, iterate and learn to make their ideas or products better and more useful, as has happened in the San Francisco Museum of Modern Art.

Example: Self Composed, San Francisco Museum of Modern Art
As SFMOMA Labs discovered with their **partnership with Adobe**, 'museums and technology companies don't always make the best collaborators' (Winesmith, 2016). Winesmith describes this as an actively tricky partnership but one that aligned to the values of what the Lab was doing and how it impacted on community and industry. The project Self Composed, developed with Adobe systems, was a highly successful blend of art and technology that engaged visitors to create 'selfies' through this very popular experience. Both partners, albeit with different focus and approaches, worked together to deliver this unique experience. Sometimes it is worth considering the unexpected partnership, perhaps at a smaller scale at first and then, if successful, it can be built upon.

Example: Foundry 658, State Library of Victoria
The State Library of Victoria in Australia has partnered with ACMI to launch **Foundry658**, a business accelerator space and business programme to assist entrepreneurs. Their process is described as a 'start-grow-scale-connect' model that had initially been realised at ACMI-X, the 60 seat co-working space dedicated to the creative industries.

Partnering with education

GLAM Labs are in a prime position to provide data as well as expertise to promote educational goals. Contributing to and running courses, hosting workshops or hackathons, supervising interns, giving presentations, writing articles, blogs and participating in Book Sprints present possibilities to spread knowledge and skills and connect with the wider community. This can be done in all levels of education.

Labs have both long-term partnerships and short-term project-based collaborations with universities. These include student placements, large and small-scale research projects, sharing datasets and building tools. Labs frequently provide partnerships and technical support to students and researchers, such as the machine learning project of the Library of Congress Labs undertaken in partnership with the University of Nebraska.

Example: Machine learning project, Library of Congress Labs and University of Nebraska

The Library of Congress Labs team partnered with the University of Nebraska, Lincoln to apply machine learning to pre-processing collections to increase discoverability and research use of digital collections. The partnership provided real-world applications to research questions. The selection of training data and tools utilised was completely transparent in contrast to black-box, trademarked solutions that are offered by vendors. This partnership has inspired future plans for the Lab to engage universities in matching their interests and agendas to the Library's needs around applied research and development.

Universities recognise that digital innovation or training in design thinking, which is crucial for some of their students, may not currently be covered by the courses offered by their institution. Labs can bridge this gap by bringing in students and exposing them to design processes in real projects. This mutually beneficial partnership is illustrated in the following example.

Example: Cleaning and curating Data for the Library: BL Labs, British Library
In 2018, BL Labs collaborated with University College London and the BA&npsb;/&npsb;BSc Science and Arts undergraduate degree elective module, 'Information through the Ages' where the students curated a smaller collection of public domain books from a much larger set. They did this using tools such as OpenRefine for cleaning up the metadata and Python scripts to interrogate a large amount of OCR'ed text using data-mining techniques. The derived dataset will be published on the British Library's data portal and the students will be become 'dataset creators' with their names visible on the British Library data repository.

A new kind of partnership

Labs can offer a space where formerly external partners become an integrated part of the Lab, moving beyond the **them** and **us** dualism. GLAM Labs can be seen as a **third place**, which, **according to the Wikipedia definition**, 'is the social surrounding separate from the two usual social environments of home ("first place") and the workplace ("second place")'. This **third place** could be a way to rethink how cultural heritage professionals interrelate with a wide range of different people and communities within the Lab space. This third place plays out within people rather than physical or virtual spaces; in Labs all partners are equal. The below example demonstrates such a space where innovation, experimentation and co-creation transpired in true dialogue.

Example: Imaginary Cities, BL Labs

The **Imaginary Cities Exhibition at the British Library** was an arts-research project and exhibition by British-American artist Michael Takeo Magruder. It transformed the British Library's online collection of historic urban maps into fictional cityscapes for the Information Age (Magruder, 2019) manifested as four art works. In the exhibition publication, BL Labs Manager, Mahendra Mahey explains with regards to numerous BL Labs projects: 'Nearly all of these ventures began as a conversation, and this was certainly the case with Michael Takeo Magruder's *Imaginary Cities* [...] and now that this exhibition has become a reality, I can't help but look back and remember how it all began because of a conversation' (Mahey, 2019a).

Key points

Successful engagement with users and partners:

- Requires the understanding of user communities and their needs.
- Helps to target and tailor Lab activities.
- Supports knowledge dissemination, data refinement and the development of tools and services.
- Is based on the idea of collaboration and co-creation in an open and equal dialogue.
- Can lead to more formal partnerships.

Rethinking Collections as Data

Without data there are no Labs. This chapter covers identifying collections and assessing their suitability for Labs, how to describe them, make them accessible and reusable. It also touches on strategies for dealing with messy data as well as some useful basic concepts: different forms of collections, digitisation, metadata and preservation. It closes with a case study looking at making data available.

About digital collections

Cultural heritage institutions collect a wide range of materials. Since the early 2000s, these materials have been increasingly digitised and published in digital libraries, in archival portals or museum websites. Digitisation, along with techniques such as OCR, impacts a collection to an extent that its uses could be limited. It is therefore important to document the digitisation process in as much detail as possible as this feeds into the level of transparency of the collection. Collecting and preserving born-digital materials, such as web archives, social media, video games and software, is becoming increasingly common place.

Long-term thinking and planning about collections ensures their use for decades to come. This process would normally be a task for the parent organisation as it raises pertinent questions about the longevity of an institution. However, when a Lab publishes data in any form, digital preservation of that collection should be kept in mind. Considerations should include adding DOIs, how to deal with metadata, digital objects and associated data that constitute the collections themselves. The **Digital Preservation Coalition** provides an exhaustive resource about this area.

Collections as Data

Providing data-level access to digitised and born-digital collections from galleries, libraries, archives and museums is at the heart of GLAM Labs activities. Users are increasingly generating their own data and experimenting together with GLAM Labs to jointly generate new datasets. Access to collections in bulk means opening data and metadata associated with digitised and born-digital cultural heritage collections for use in new ways. A great example of a team working to facilitate the publication of collections as data is the Mellon-funded initiative Always Already Computational: Collections as Data, which aimed to find a way to document, exchange experience, and share knowledge for 'supporting users who want to work with collections as data' (Padilla, 2019).

Sharing data

When sharing collections as data, several aspects need to be considered. What data is available to share? What is in the datasets and how were they constructed. In addition, each dataset will have distinct rights statements - or a lack there of. A decision needs to be made about how much time – if any at all - is spent on data cleaning and curation before sharing. Also, how will the data be made available to users?

Identifying collections

Requests to use collections as data often come from an external partner or user. In addition to helping to facilitate external requests for data, many Labs proactively gather collections data that could be of interest to broad audiences. A list of digitised collections is a great starting point for considering what has the potential to be used computationally. However, this list may not exist in a single place, especially in a distributed context, as this example shows.

Example: Digital Assets, ÖNB Labs
Information about digitised collections at the Austrian National Library is highly fragmented and distributed across several departments and storage formats. One year after launching ÖNB Labs formally, the team is still in the process of locating additional, hidden digitised assets.

Gathering information about past and ongoing digitisation projects provides a perfect starting point in order to have a record of digitised and born-digital collections. This can be achieved by consulting knowledgeable people within the institution, such as curators, custodians of library systems, or IT specialists. Some data might not appear to be a collection at first glance, such as records in a digital

library catalogue, but can be very relevant as the following example shows.

Example: Delpher, KB National Library of the Netherlands
The KB publishes around 100 million pages of digitised text on the platform Delpher. The Centrum voor Wiskunde en Informatica (CWI) worked with the anonymised search log files of the platform to research user interest and behaviour in the digitised newspaper section of the search platform (Bogaard et al., 2019). The developed dashboard has been subsequently shared with the KB Lab and is now available for internal purposes.

Collection Descriptions

To facilitate reuse of collections, it is important they are described in detail. The more information that can be shared about the development of the dataset, the better researchers (and a Lab) are able to work with it, as this provides transparency which is crucial for source criticism.

Transparency

The implication of providing transparency for each dataset is that a Lab has to be open and communicative about the data and collections that they have. This is more challenging than it sounds within a single organisation. Acquisition and preservation policies change over time, as do documentation and responsibilities. More often than not, collections are big and messy and documentation varies widely.

Shared knowledge between users and the organisation about the collections and the data is crucial for successful outcomes from collaborations. Providing documentation, for example, about the original purpose of a project, selection and digitisation strategy, implementation, technical details, and subsequently communicating those appropriately to users, is a time-consuming endeavour, but worthwhile.

Bias

By providing transparent information about the provided datasets, it becomes possible to examine sets for (hopefully unintended) bias. Very often this bias creeps in during the selection process for practical reasons, such as book size, printing letter or even copyright issues. This might result in a non-representative digitised collection as opposed to the physical one as seen in the example below.

Example: Sample Generator, BL Labs
The BL Labs competition winner of 2013, Pieter Francois, developed a tool to search 1.9 million records of books from the 19th century held at the BL. Of these, 2.6% were digitised. He wanted to know whether the 2.6% that were digitised were representative of the larger sample. The tool enabled researchers to select representative samples of books based on filtered search terms of both digital and physical items from a larger corpus for further analysis. It gave BL Labs a deeper understanding of the distribution of the digitised material that the British Library holds relative to the physical collections both over time and by topic.

Other issues with bias that could be relevant to research are related to the more ethical concerns about representativeness of gender and ethnicity. As stated by Zaagsma (among others), digitisation is far from neutral (2019).

Access

Ideally, a Lab would provide open access to the data being made available through the Lab. However, owing to a variety of reasons (including, but not limited to, copyright, donor agreements, and other collection-dependent restrictions), a Lab may need to work with restricted data. Ideally, access is then still possible for research purposes. There are two main ways to provide this:

Off-site access

If open access is not possible due to restrictions, the Lab could opt to provide data for research purposes under certain conditions. This is naturally only an option if the copyright holders agree to this or have entered an agreement with the organisation that this is allowed. Researchers can contact the Lab to request data. The Lab can then set up an agreement or contract with the researcher defining the regulations attached to the use of the data after which it can be shared.

Example: Restricted data with off-site access, KB National Library of the Netherlands

The KB has set up a **Data Services** team in the Collections Department for everything related to the delivery and accessibility of the KB's digital collections. For all collections available on **Delpher**, the KB has entered into agreements with right holder's organisations that the data may be shared for research purposes. Researchers sign a standard agreement when data is requested and they are required to delete the data once the agreement ends.

On-site access

On-site access may be required for very restricted or personal collections. Typically, in these cases, users must contact the Lab or organisation in advance of accessing the data, formally agree to terms of use, and access the collections on-site only. Research outputs may be limited to agreed-upon parameters with the Lab or organisation. It is also possible to create on-site access with a secure connection, as shown in the example below.

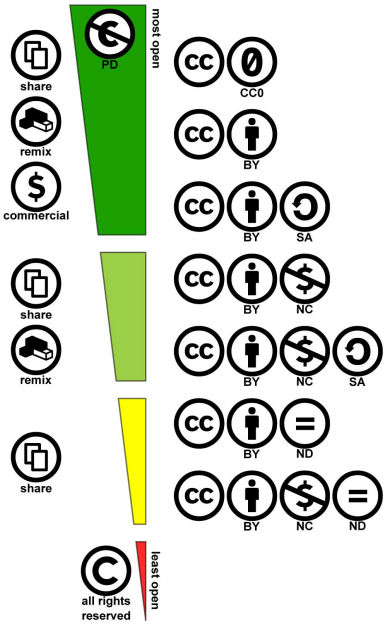
Example: Restricted data with on-site access, The Royal Danish Library
For certain types of restricted data, the DK provides researchers with a service where they create stand-alone, internal computational clusters, ensuring that the data is not available beyond its agreed purpose. In order to comply with EU General Data and Protection Regulations (GDPR), the library creates and keeps a log file for six months in order to recreate what the researcher has done on the cluster. In more complex use cases (such as the Danish web archive data), the DK provides a developer / consultant to collaborate with the researcher and ensure regulations are followed.

Rights and licensing

The rights status of a data collection or item is not always clear. Collections may even contain **orphan works**. While these issues around rights statements are complex, it is important to be aware of them and to be able to have an informed conversation with legal advisors about using collections within the legal framework. Lab teams are often the group which is well placed to advocate for the broad use of collections and data that have unknown rights statuses or with complex implementation requests. It is therefore important that a Lab member is well-versed in the IPR regulations of the country and understands the flexibility that may exist in the law.

Providing access to data and collections comes with its own set of concerns when discussing licensing. Legal restraints and the lack of open licences limit the use of data. Different legislation exists in all countries, and as such there is no-one-size-fits-all (collections) standard. Labs need to consider a managed-risk approach to licensing.

Licences that are commonly used in Labs (and even the entire cultural heritage community) are the **Creative Commons licences**. They are usually described by their abbreviations, such as CC-BY-SA. A full list of CC licences and their corresponding possibilities for reuse can be found in the diagram below.



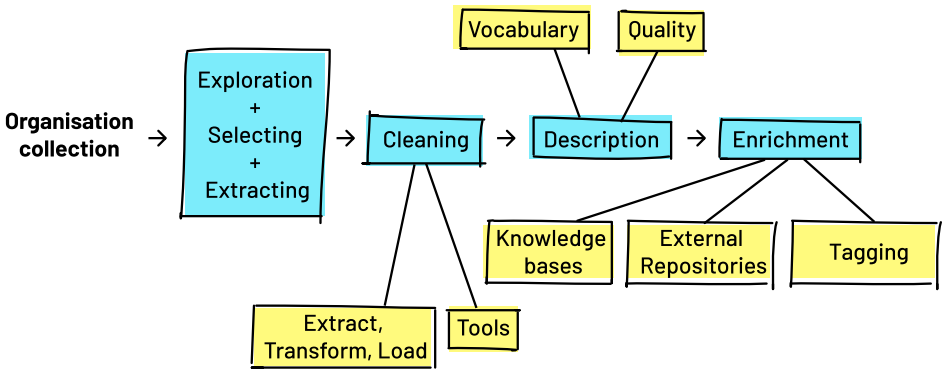
Creative Commons licences

Curated versus messy data

Publishing data as a Lab can be done in more than one way. Depending on the intent, timing and necessity, a dataset can be released straight out of the digitisation process. This results in messy data, which may not be suitable for all reuse purposes. However, it is a fast way to share collections and is often seen within the Lab community. Another way is to curate a dataset before publishing. This requires quite an effort and is not always possible. This does provide users with a clean and easy-to-use collection.

Curated data

There are several steps concerned with curating a dataset. The following diagram presents a possible option where the data is firstly explored, then selected and extracted, after which it is cleaned and normalised using tools such as OpenRefine, described through controlled vocabularies, and finally enriched using techniques such as Named Entity Recognition and Linked Data.



Creating a curated dataset

A wide range of data benefits result from the curated approach, such as a library catalogue in the following example.

Example: Migration of a library catalogue into RDA linked open data, Biblioteca Virtual Miguel de Cervantes
The catalogue of the Biblioteca Virtual Miguel de Cervantes contains about 200,000 records which were originally created in compliance with the MARC21 standard. The library wanted to open up their catalogue through linked open data. To do this, they mapped the contents of the database by means of an automated procedure to RDF triples which employ the RDA vocabulary to describe the entities, as well as their properties and relationships. A specific online interface was then built to query this newly created database. Next to this, the data is publicly available and easily linked to other applications. (Candela et al., 2018)

Messy data

Most Labs open data without any curation. Users can then explore it, and decide how a collection might fit into their research. Technological solutions can sometimes provide workarounds, and data that is too messy for some uses might be easily analysed with other methods.

If the messiness of the data is detrimental to a particular research project, data cleaning should be incorporated into the project when proposing it. The cleaning can then be done by project partners, in collaboration with the Lab, or by the user community through a crowdsourcing platform. These costs and efforts needed for the data to be cleaned should then be factored into the project and cannot be done by the Lab alone.

Other dataset examples

In addition to the main digital collections of the institution, other types of datasets can be shared by the Lab.

Derived data

Extracting data from a larger set produces a collection that qualifies for different usage. These extractions are usually time-consuming and sharing the end results benefits the Lab community. An example of a derived dataset is the KBK-1M set of the KB Lab.

Example: KBK-1M, KB Lab
During a researcher-in-residence programme at the Dutch KB Lab, the researchers and the Labs team extracted all illustrations and captions from a larger set of digitised newspapers. This set (**KBK-1M**) is now on offer as a derived set so other researchers do not have to re-extract the data.

Training data

Data that is suitable as training data in deep learning applications is much sought after. Providing accurate training data in adequate quantities is a prerequisite for a multitude of research projects. Going one step further and not only offering training data but also sharing the pre-trained model (or to be more specific: the weights for the model, which is the output of the training process) for reuse, significantly lowers the entry barrier for using the collection in a machine learning context and provides useful information for researchers working in this field.

User-generated data

Some users generate data that might be useful for others, and if they are willing to share them and this task falls within the scope of the Lab, the following questions should be considered:

- Does the Lab have the technical infrastructure to accommodate incoming data from users?
- How does the Lab ensure transparency about the creation of the data?
- Who owns the rights to the created data? Who is the author?

- Can the Lab accommodate possible necessary embargoes or other access limitations?
- Is the Lab able to ensure (to a justifiable extent) that the offered data complies with existing national and transnational legal frameworks?

Crowdsourcing projects frequently exist in parallel to Labs, offering the possibility to collaborate and reintegrate the user-generated data back to the organisation through the Lab. Various forms of user-generated data exist and crowdsourcing initiatives are not the only source. For example, the ÖNB Labs works with user-generated data from Transkibus in the following fashion.

Example: Transkribus integration, ÖNB Labs
At the time of writing, the team of ÖNB Labs is enabling their users to upload collections of their Labs data to **Transkribus**, a platform to train and apply models for handwritten text recognition (HTR) and optical character recognition (OCR) on digital images. The result (user-generated text recognition) can then be re-integrated into Labs to be shared with and re-used by other Lab users. Doing so in a manner that satisfies all requirements concerning transparency and quality of data, sustainability, as well as all legal aspects, is a process that is anticipated to take the better half of a year to prepare and implement.

Case study: Data Foundry, National Library of Scotland

The National Library of Scotland launched its **Data Foundry** in September 2019. The Data Foundry is the Library's data delivery platform, and is a part of its Digital Scholarship Service. Initial data collections offerings included digitised collections, metadata collections, map and spatial data, and organisational data, with

further collections, such as web archive data, collection usage data and audiovisual data, are planned for future release.

The Data Foundry is based on three core principles:

- Open: The National Library of Scotland publishes data openly and in re-useable formats.
- Transparent: The provenance of data is taken seriously, and there is openness about how and why it has been produced.
- Practical: Datasets are presented in a variety of file formats to ensure that they are as accessible as possible.

This has involved cross-Library effort to produce data collections openly and in consistent formats, bringing together curators, rights experts, developers and metadata specialists, and has resulted in a mode of delivering data which seeks to establish — and continue to advance — best practice.

Open

All data provided on the Data Foundry has been rights assessed, and licences and rights statements are made available clearly with each dataset: both on the web page and in the readme file associated with the dataset. The Library does not assert further copyright control over the datasets that it produces, and information about the **licensing and rights statements** used as well as **Open Data Publication Plan** is available on the Data Foundry.

Transparent

This forms one of the five aims of the Digital Scholarship Service: 'Practise and promote transparency in our data creation processes'. Contextualising the data creation process maintains the thread from the original, physical object to the object-as-data. As there are no existing standards or processes for how to present information about how and why items and collections have been digitised and presented as data, the National Library of Scotland currently includes this information within the METS files of digitised material, and within the data in metadata collections.

Furthermore, each dataset is placed in context by a series of declarations on the web page on which it is presented, such as: whether OCR has been cleaned up; how many files the dataset includes, and in what format; how many words and lines are included (for text-based collections); and the years covered by the dataset. This information is a key part of the Data Foundry's design and serves to provide an at-a-glance contextualisation of data which, without this information, can feel rather abstract.

The library more broadly is transparent about its workings, and the Data Foundry provides a platform for organisational data, such as financial information and environmental data.

Practical

From the start, the vision for the Digital Scholarship Service's data offerings included the importance of making datasets available in a variety of formats, and in a consistent way, to enable users of varying skills and needs to use the collections. This involves making data available as downloads, based on feedback from the user community; offering trials of big datasets; and ensuring that all digitised collections are available as both METS / ALTO and plain text formats. Metadata collections are provided in MARC and Dublin Core, to help bring library metadata to new audiences, and organisational datasets are provided in regularly updated CSV files.

The Lab Data Recipe

This recipe puts together a collection as a dataset in a quick-and-dirty way. You may get messy, so wearing protective clothing such as a nice set of emotional armour is advised. Make sure it's comfortable, because you might need to wear it a long time and it might get sweaty. This recipe can be applied to any type of data, but here text is used as the main ingredient.

Emotional armour

Ingredients

- A bucketload of digitised images and corresponding text.
- If possible: metadata.
- An enthusiastic Labber.
- A (boundary-pushing) legal advisor.
- A liberal sprinkling of resilience.

Instructions

****Please note that cooking times may vary, as institutions have different styles of ovens, energy levels, and appetites for risk.**

1. Dissect your collection and find out what it contains and how it was created. This might make no sense at all and be completely random and biased, but don't be alarmed. You may need to talk to other people in your organisation about this, but don't worry, they are usually quite happy to talk about their work and giving them cake helps. This is how you build relationships (and diabetes).
2. Document everything you have learned in step 1. You don't have to do this alone and copy / paste is an excellent approach.
3. Prepare a pitch for your legal advisor on why the set should be made available under an open licence.

   NOTE: This step is only necessary if your legal advisor does not like to push boundaries.

NOTE: If you have data that is in copyright, include the workaround to provide access in your pitch. Read the chapter on Sharing Data for helpful tips.

4 Stir the documentation, your pitch, the legal advisor and your organisation's management vigorously in a big pot (ideally in a locked meeting room) until the decision is made to publish the collection as a dataset.

NOTE: This step may take some time and this is where you might get dirty. Don't take it personally as you are pushing a boundary and might feel the boundary push-back.

5 When you have been given the green light (if you choose to wait for that, we're not suggesting anything here...), the collection is ready to be published as data.

6 Serve with some herbs of your choice, all documentation, a clear rights statement with the open licence and contact information on a public platform.

NOTE: If you don't have an institutional publication platform, we recommend to publish the data on an open repository such as **Zenodo** or **Archive.org**

Key points

Collections as data for GLAM Labs means:

- Enabling computationally driven use of the collections.
- Identifying collections and assessing their suitability for Labs projects.
- Making collections accessible and reusable.
- Dealing with messy data.
- Considering related work in digitisation, metadata, rights and preservation.

Transformation

Labs are transformative by nature. This chapter discusses how Labs bring about change, both on an institutional level and within services. It includes information on how tools are developed and a case study on how a bespoke tool was moved to an operational service.

Labs championing change

Generally speaking, most Labs are born out of the need to transform an aspect of, or introduce a new element to, an existing GLAM institution. If this is the case, embracing an innovation mindset in the Lab's vision and values is pertinent. To do this, setting conditions for experimentation, failure and risk-taking, are key.

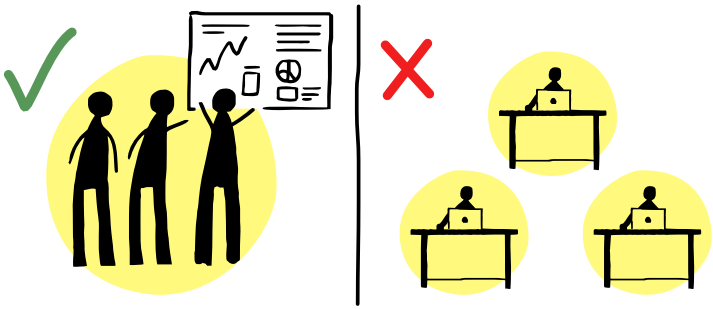
There is no one-size-fits-all approach to how organisational transformation proceeds or how success is measured. Some Labs are focused on organisational transformation and others on service and product innovation. Both forms of transformation are equally valid and will be determined at the vision, values and getting started stages of setting up a Lab.

Organisational change

For Labs focused on organisational innovation, the main aims are embedding new practice, skills and mindsets into the organisation. These Labs may, by design, have a shelf life. Transformation can be measured by the shift of Lab activities and practices to business as usual.

Cultural transformation

Labs are small and agile units and experimental by nature. Their parent organisations are much larger, provide broad services, and commit to a long-term perspective. This naturally positions institutions as conservative and risk-averse. To roll out institution-wide experiments, Labs need to build internal trust and support by acknowledging the experience of other teams, staff members and managers and share credit. This is an effective strategy to win the needed trust and support in an organisation. The Lab-style way of working promotes collaboration, knowledge sharing and draws staff out of isolation.



Teamwork vs. Individual work

The growth of Labs addressing cultural transformation of an organisation can be seen as a response to current challenges, as institutions are under pressure to reimagine themselves and redefine the ways they create value for their communities. Labs often ask and answer questions about the internal issues they face — how they operate, structure and organise, how and for whom they deliver programmes, how they create exhibitions and online services, and more broadly how they engage their users and visitors.

The concentration of digital expertise and mindsets in a Lab, setting the conditions for working and failing quickly, embracing risk, engaging with online audiences, and sharing of skills, knowledge and expertise are hallmarks of a Lab working towards digital transformation.

Product innovation

A main aim of a Lab could be to transform service delivery models, develop products and thereby ensure constant iteration and

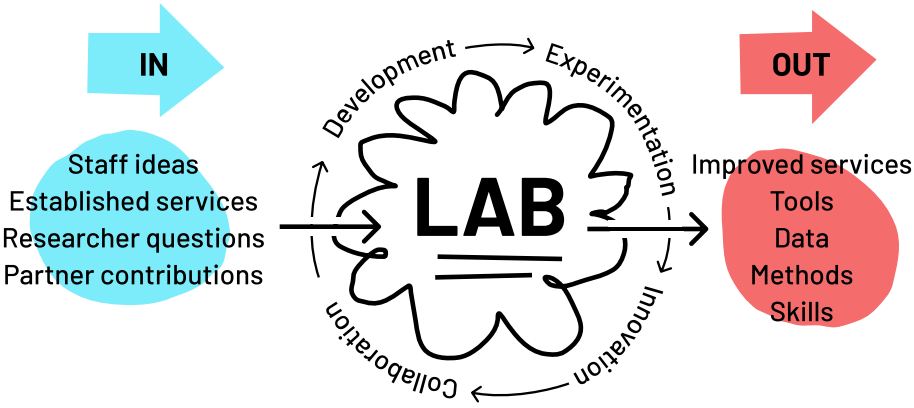
evaluation of new technologies before embedding them into existing teams, processes and services. In these Labs, teams continually scan technological, cultural and social horizons, learn from and work with communities of practice, staff and users.

Service transformation

In all areas of innovation and transformation, it is important to remember that technical change is easier to achieve than social and organisational change. Labs that focus on the development of new products and services can be seen as initiators of a specific type of digital and cultural transformation that is consumer-orientated. Libraries, in particular in the GLAM sector, are quite advanced in transforming their digital service delivery models through established and embedded Labs. Digital collections, collections as data, experimentation with new tools and products, working with users to understand their needs, and inter-disciplinary approaches that draw together technologists, curators, collections specialists, creators and researchers are hallmarks of a Lab focused on service transformation.

The Lab Process

Experimentation and innovation occurs in a setting where there is room for exploration and risk-taking, and a mandate to improve the status quo. This starts the transformation and the Lab process grounds it. By taking in ideas, services, questions and contributions, through an iterative process of development, experimentation, collaboration and finally innovation, the Lab produces improvements in tools, data, methods and skills and finally, Change.



The Lab process

From prototype to practice

The primary aim of Labs is to enable innovation to happen, using technology which may often require the development of new tools and alteration of existing ones. When successful, these tools go from Lab prototypes to embedded organisational tools. This process is never linear, and many aspects have to be taken into consideration when shifting from prototype to practice. Approaching this in a structural manner can result in successful outputs for institutions. Several Labs have been successful in the implementation of Lab projects in the organisation which have later contributed to the development of services, such as the LOOM Project of the DX Lab and the KB Labs case study at the end of this chapter.

Example: LOOM Project, DX Lab
LOOM was the DX Lab's first collections experiment, creating serendipitous discovery of collections online. Conceived as a small single-stage project, through the design process and subsequent iterative development it grew into a three-staged approach to delivering multiple ways of discovering this digital collection. The project was successfully received by users, and the impact strategically demonstrated to the institution; its findings have influenced the State Library of New South Wales's Collection Experience Programme. **DX Lab LOOM project**

Developing tools

Working with and developing tools in a structured way expedites easy integration. Since there is no one-size-fits-all for Labs, best practices around the preparation, creation and sustenance of tools can be helpful in determining the Lab's approach. Working with existing standards provides fertile ground for rapid and productive software development and enables others to build upon Labs' work.

Preparing tools

Software development can become very personal, very quickly. Working in a team, or even with related colleagues or teams, requires a shared code of conduct for how to work together. Being honest, but kind, when collaborating ensures that expectations of interactions and modes of working are aligned. Furthermore, providing a clear framework for communication and methods of working, as well as shared goals, clears the way for successful collaboration. An example of this is the principle of shared code ownership: agreeing to this early on fosters tighter collaboration and ensures there are no disputes further down the line. Software licensing is part of the preparation stage. Choose a licence which is as open as possible but still meets the demands of your institution. Helpful tools are available for this, such as **Choose a licence**.

Existing skill sets and knowledge within a team inform the choice of a programming environment. However, for teams with a range of skills, certain software libraries are strongly related to the type of analysis needed. For example, there are a large number of Natural Language Processing (NLP) tools available in programming languages such as Python and Java, and computer vision is well-rooted in C++.

Creating tools

Writing documentation during the modelling process is important in the Labs environment: documentation should be part of the creation process as this provides transparency and context. Related to this is test-driven development, enabling bolder changes.

As with all software development, using an issue tracker is a helpful way to provide an overview of work and to triage development. Source code management is a system to track changes in the code base, and which allows collaboration — enabling multiple people to work on the same code base at the same time. This enables Labs work because:

1. Contributing to open source software requires use of source code management to make it possible for others to contribute to the code and help foster collaboration.

2. Tracking enables more radical changes to be made to code: there is less concern about the fragility of work, as it can always be rolled back.

Currently, **Git** is the industry standard for source code management, making it easy to branch out and experiment with code.

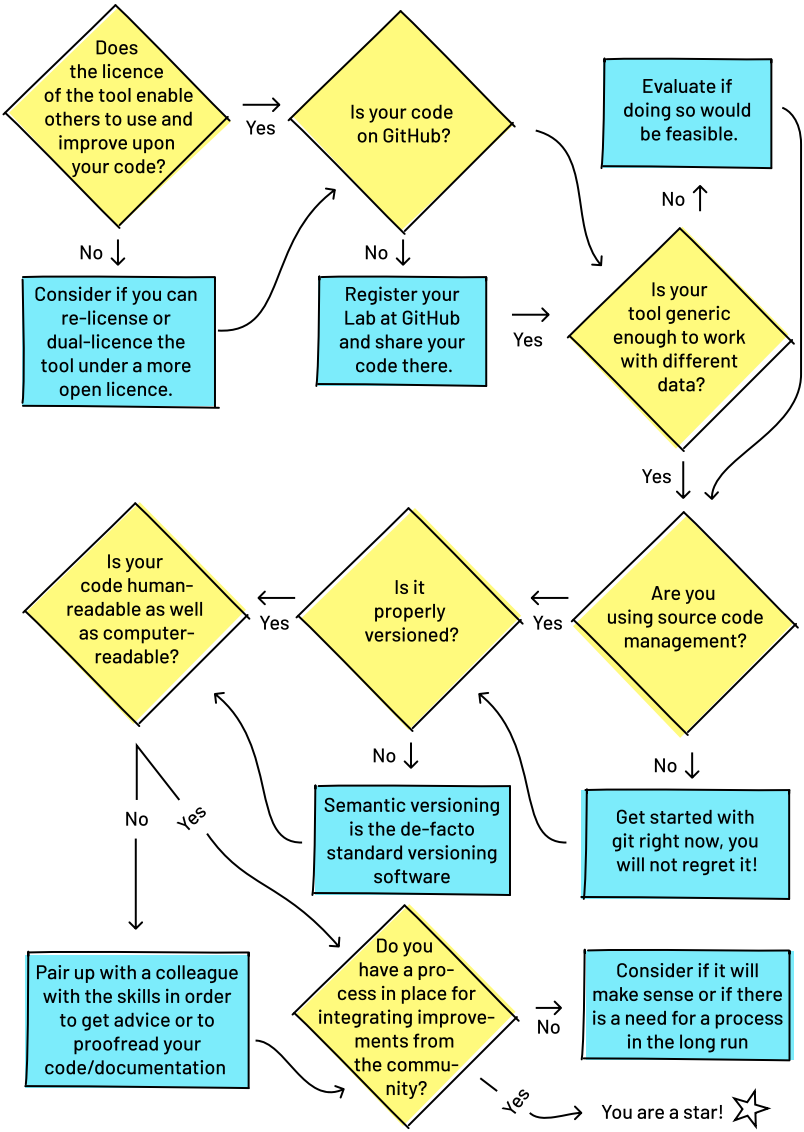
Continuous Integration / Continuous Deployment (CICD) means having a tool chain which automatically builds your product from your code and deploys it. This enables fast turnaround of features, as well as experimentation. It supports the ability to evaluate changes with users and an iterative approach to problem-solving.

Rapid prototyping / Minimum Viable Product (MVP) is central to the idea of experimentation and enables understanding of whether code works. It also allows work or projects to fail quickly, leading to the ability to move on, and therefore progress more rapidly. In an experimental environment, it isn't always clear where the project is heading; even a basic prototype is better than unordered thoughts, enabling iteration, development and improvement to continue. Rapid prototyping also helps to narrow down choices of programming language.

Sustaining tools

Sustainability is where everything falls into place. Choices of licence, source control management and shared code ownership have a big impact on the sustainability of your tools: planning for sustainability throughout tool creation is important. When developing new software, a Software Sustainability Plan could be used to design the output and built-in sustainable options. A good example of such a plan is the **NL eScience Center Software Sustainability Protocol**.

Publishing code for preservation and sharing should ideally be done on an open and sustained platform. Code published on Github, for example, can also be preserved in Zenodo, thus automatically adding a DOI to the code, again contributing to the sustainable nature of the software. The following flow chart suggests a method for evaluating tool sustainability.



Is my tool sustainable?

Decommissioning tools

The tools that you are offering might be outdated at some point or might end up having just a few users. It is therefore recommended to re-assess the tools on an annual basis in order to either update or stop them. Communicate that development has stopped on a tool so others are able to continue development.

This checklist provides tips on what to think about when decommissioning a tool:

1. What type of tool needs to be stopped?
2. Are we required to keep this tool live? (This might be the case, for instance, when working with an external funder.)
3. Can / should the tool be absorbed into the parent organisation?
4. Who is involved in the development of this tool?
5. Who uses the tool?
6. Are there external links to this tool that need to be considered?
7. How should the tool be preserved?
8. What documentation is needed?
9. Who needs to know the development of this tool will be stopped?

Case study: From bespoke tool to service: Royal Danish Library's SMURF

A few years back, members of the IT Department at the Royal Danish Library participated in a workshop at Aarhus University. The subject was Digital Humanities. At the workshop, various tools and methods were demonstrated. The tools showed how researchers worked with

statistics and datasets. One of the tools was an n-gram viewer. Since IT departments have a great knowledge of the collections and have strong competences in the development of frontend and backend systems, those who participated in the workshop decided to do a proof of concept of an n-gram viewer on the newspaper collection, and shortly after SMURF was created. The n-gram viewer was then demonstrated to selected university researchers who found the tool highly relevant and useful. The tool is applicable to teaching, but also to a more explorative approach to the study of subjects. At this point, the solution was still internal.

In order to make the tool available to students, subsequent collaboration was initiated with a legal advisor to clarify which data could be used from the collection. The process was long, but the dialogues and collaborative investigation of how to show data to the public was needed, and in the end was also fruitful, with SMURF being released in 2016. SMURF is now being used at several universities in Denmark, where SMURF graphs appear in teaching material and are integrated in different courses at the universities.

Because of the high usage of the tool, the IT Department is currently working on moving the tool out of the Lab.

Key points

Transformation:

- Is at the heart of the Lab process.
- Enables Labs to champion organisational, cultural and service change.
- Promotes prototyping as a pathway to practice.
- Enables both sustainability and decommissioning of tools.

Funding and Sustainability

Labs can't work without money. There are many funding mechanisms that might be applied to a Lab, from structural institutional funding to external funding, each with their own effect on the sustainability of the Lab. This chapter discusses the various funding options and their pros and cons, and how to plan for a Lab's sustainability.

Funding

Funding models depend on organisational context and individual Lab plans — but also inform what can be possible with a Lab and where the future direction of a Lab may go.

Structural organisational funding

Structural funding, as opposed to the funding of a pilot project, running only for a limited time, means that the Lab is planned to be sustained over a longer period. So whilst the actual sum allocated to a Lab can fluctuate on a year-by-year basis, the period for funding should at least match the period of the institution's strategic plan. The KB Lab of the National Library of the Netherlands is an example of this.

Pros

- Offers the most secure and sustainable form of funding of activities, people and contents of the Lab.
- Clearly embeds the Lab in the general organisational structure.

Cons

- Rather rigid as a type of funding, as the allocated budget cannot be used for day-to-day activities of the organisation, which proves challenging for institutions with little funding.
- Labs can get caught in a Catch-22: they require structural funding to set up the Lab, but to gain this funding, they need to be already established to demonstrate their value.

Short-term organisational funding

Labs often start as pilot projects, having initially to prove their worth to the organisation and are only provided with temporary short-term funding. Temporary funding in itself is problematic as it impedes job stability and renders Lab activities uncertain. If the Lab is set up as a pilot project, it's advisable to identify and plan for funding rounds in case the Lab is a success.

When a Lab is funded over a limited period, this time frame shouldn't be too short (for example, 4 years rather than 2). This allows the Lab to plan its activities and establish itself. Evaluation of the Lab can be planned as part of its activities and can be outsourced to an external company to ensure independence. Alternatively, staff from another department in the same organisation could take on the role of a 'critical friend'. The evaluation results should be considered specifically and not affect the overall funding of the Lab. As soon as a decision about the future of the Lab is made — whether it's to discontinue its activities, integrate it into the organisation, or to acquire new or additional funding — it should be communicated to the Lab team.

Short-term funding often includes the intention to integrate a Lab into the organisation and hence serves as a precursor to structural funding, making it an overall sustainable funding option. **KB Tech Lab** at the Royal Danish Library, and **ÖNB Labs** at the Austrian National Library are examples of Labs that are based on this type of funding.

Pros

- Allows institutions to explore what benefits a Lab can have.
- Provides time for a Lab to build a longer-term financial plan.

Cons

- Introduces uncertainty to the work of the Lab, putting a strain on all aspects, including — and possibly most importantly — its people.
- Requires time resources to plan the Lab's future beyond funding cycles.
- Staff are likely to leave insecure job setups, and look for new employment prior to the end of their contract.

Short-term external funding

Short-term external funds allow for a Lab to expand its resources on a project basis. There are various funding options for cultural

heritage institutions both nationally and internationally. See for example the **funding information** of the European Commission, or the **grants information** of the National Endowment for Humanities in the United States, or from the **Andrew W. Mellon** for other parts of the world. To learn more about funding opportunities, contact the national funding body or governmental funding contact point. There may also be other directories of information about philanthropic organisations that may fund the Lab. The establishment of BL Labs is an example of philanthropic funding.

Short-term external funds are not sustainable, but they provide opportunities to explore the option of a Lab, to continue a certain aspect of a Lab once short-term organisational funding ends, or to grow activities not covered by structural funding.

Pros

- If external funding means additional funding, it provides opportunities to grow or continue the Lab.
- Acquiring external funding minimises the financial risk for the organisation.
- By teaming up with external partners, the Lab's network grows.

Cons

- Acquiring additional funding is a time-consuming process and requires particular skills.
- Might lead to additional requirements such as frequent reporting or public engagement activities.
- Operational funding may not be included in external funding models, so operational costs may have to be covered by the parent organisation.
- The acquisition of short-term external funding may lead to dependency on this model, or expectations of further acquisition by the parent organisation.

Funding Models for Specific Lab Activities

Options for funding activities

Labs can also acquire additional funds by charging user fees for certain activities, through patron donations, by crowdfunding specific activities, or by organising events that generate income. Fundraising is a specific skill that can be difficult to acquire. If fundraising is planned as a source of income, this should be taken into account when selecting the team, or fundraising should be provided by the parent organisation.

Pros

- Additional funding provides opportunities to grow or continue the Lab.
- When using crowdfunding, the Lab community is able to contribute to the development of the Lab.

Cons

- This type of external funding is only meant for short-term activities.
- Acquiring additional funding is a time-consuming process.
- Fundraising requires a specific skill which might not be available to all team members.
- Might add requirements and expectations, such as frequent reporting or public engagement activities.
- Charging fees for Lab services raises expectations with paying customers which need to be met to sustain reputation.

In-kind contributions

In addition to monetary donations, a Lab can allocate in-kind contributions, such as sponsored hardware, volunteered time, or crowdsourced improvements to data. Crowdsourcing contributions represent significant people hours, and this level of (volunteer) resourcing can be just as valuable as monetary donations.

Pros

- Volunteered people-hours can be very valuable for a Lab as they can be directed to contribute clean(er) or tagged data.
- Involving the wider Lab network is good for building cohesion and a sense of community to facilitate collaboration.
- Hardware contributions might allow people to work with new components without any costs.

Cons

- Working with the crowd can be time-consuming and a quality control mechanism needs to be put in place.
- The Lab's community might also expect something in return for their contribution.
- Might add requirements and expectations, such as frequent reporting or public engagement activities.

Funding Necessities

Funding is inextricably linked to planning activities necessary to build a Lab. The amount of funding needed for a nascent Lab depends on the vision for the Lab, the services it plans to provide, and the staffing model needed to create and provide these services.

Prioritising expenses

If a Lab has to work with very limited funds, it is particularly important to prioritise expenses. These priorities are firmly connected to the goals of the Lab. Examples of Lab expenses are detailed later in this chapter.

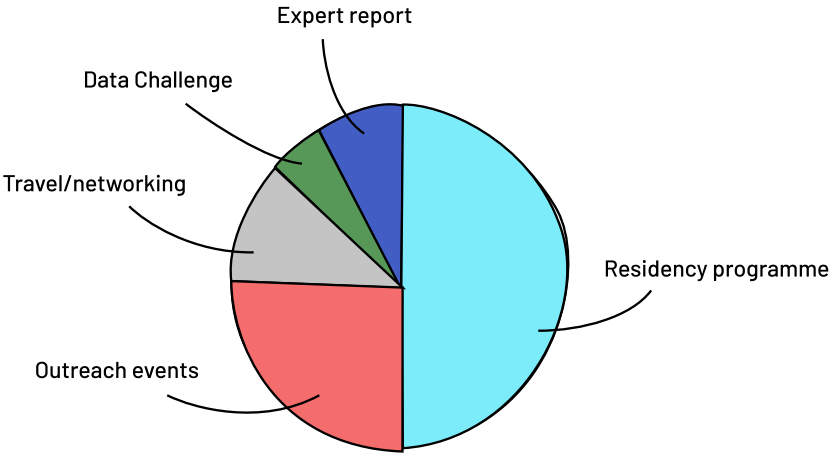
When faced with a limited budget, aiming for flexible budgeting is advisable. Don't commit to expensive year-long service provider contracts or large infrastructure purchases. Adopt software as a service (SaaS) models for cloud platforms and servers.

One element that is not to be kept flexible or limited are the staff costs. Labs stand and fall with their people and staff should therefore be valued at all costs.

The following section explores and displays different types of Lab budgets.

Budget examples

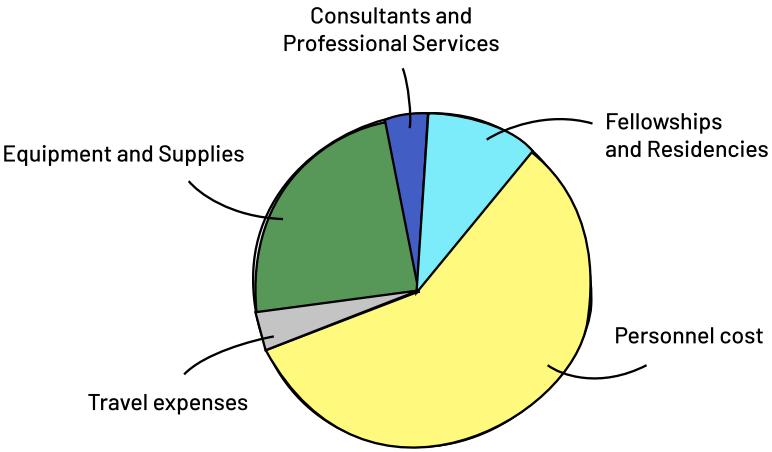
1. The operational budget of a Lab may be heavily focused towards a residency programme for researchers, as well as including a large outreach activity expenditure and budget capacity for travel and networking, challenges and external expert reports.



Example of an operational Lab budget

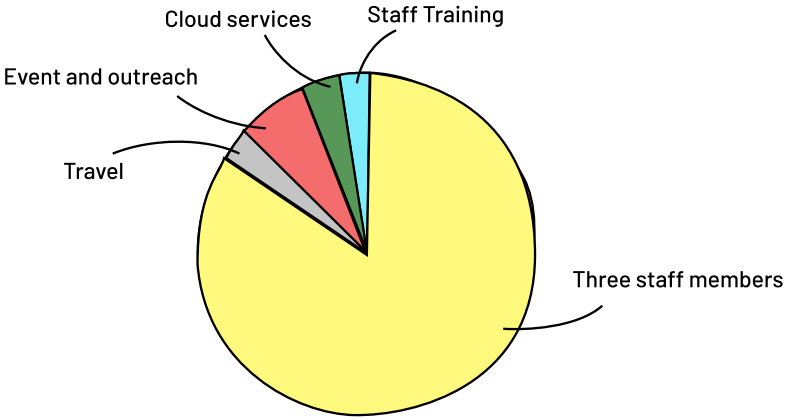
Note that the staff, administration and technical infrastructure costs are covered by the parent organisation in this example.

2. A budget from an external grant might be focused largely toward hiring additional staff and hosting fellowships or residencies. New projects require additional equipment and supplies, and further costs may include travel, consultancy fees and conferences.



Example of a budget for an external funding scheme

3. A short-term budget for a Lab is likely to be heavily allocated towards staff costs: three staff members tends to be a minimum. As well as this, funds contribute to training, cloud services costs, events and travel.



Example of a budget for a short-term internally funded Lab

Division of budget

This section describes seven distinct areas that entail budgetary considerations. Whilst other areas undoubtedly exist, these categories persist across a variety of GLAM Labs and contribute to a healthy and thriving Lab.

Staff

Staffing directly supports the operational goals of the Lab. Labs are people-based and people-driven. Arguably, total staff expenditure

may form a clear indicator of the sustainability of a Lab. Generally, it can be said that the more a Lab spends on its people, the more sustainable its activities, and the services and tools produced.

Operational costs

Depending on the cost and funding model used within a particular Lab's environment, operational costs are provided directly by the parent organisation or as a separate budget item for the Lab. They may include things such as facilities (if the Lab has a physical location), office equipment, stationery materials, promotional materials, website hosting, publishing costs, accounting and legal advice.

Hardware / software

Functioning as a subset of operational costs, funding related to hardware and software form a large part of a Lab's budget. If Labs consist of people providing activities based on digital data, then hardware and software necessitate its work. Based on the models of how hardware and software are supported within an organisation, these services may be locally-hosted, provided via cloud service, or maintained through the parent organisation's IT department.

Entertaining / Cake / Coffee Budget

An important part of the Lab are its partners — both internal and external — and its community. This very often involves social activities such as having lunch and meeting for coffee. Creating a budget specifically targeting network activities helps the team to plan these activities and makes partners feel welcome. Little gestures of hospitality can go a long way and may greatly impact a Lab's work. Meeting a collection curator or partner for coffee, and being able to budget for meetings of this kind might be a decisive factor in acquiring a new collection, creating a new partnership, or starting a new project.

Competitions

Competitions help Labs to build community and create impact. Running competitions, however, does have cost implications and should be factored in as a necessary aspect of budgeting. Some

notable examples of Lab competitions are the British Library's BL Labs Competition and **BL Labs Award** and the State Library of New South Wales' DX Labs Young Creative Technologist Award, as shown below.

Example: Young Creative Technologist Award, DX Labs
The State Library of NSW DX Lab offered a unique opportunity for a young creative technologist to undertake an innovative project of their choice. **The Young Creative Technologist Award**, proudly supported by Macquarie Group, gave a young person aged 18-25 the opportunity to create an innovative digital experience utilising some of the Library's 12 million+ digitised images and included a $10,000 cash prize.

Fellows

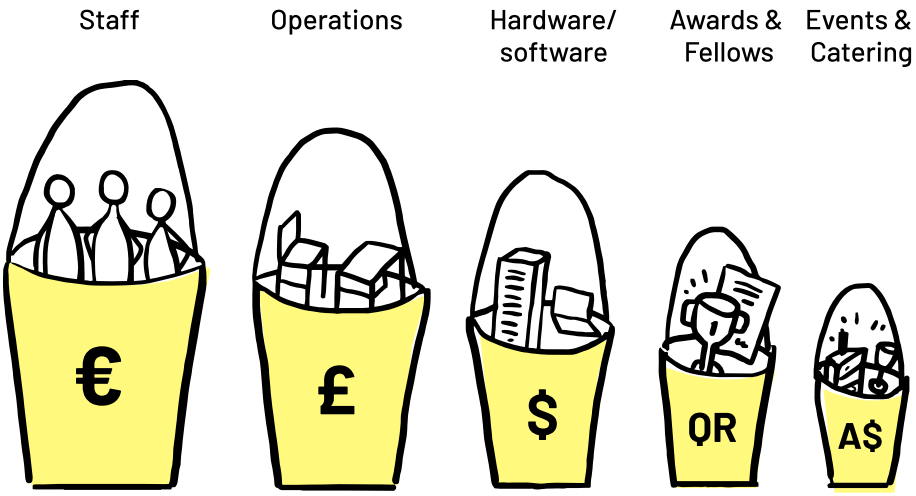
Analogous to competitions, fellowships and researchers-in-residence offer essential opportunities to a Lab and might have a fundamental impact. With regards to funding a fellow, two choices can be made: either a lump sum can be provided to the researcher, or the researcher can be seconded to the organisation. It is easier to budget with a lump sum, as in the example below, but this might require a researcher to work below their usual salary.

Example: Researcher-in-residence, KB Lab
The KB Lab hosts two researchers-in-residence per year through secondment for 0.5 FTE for 6 months. An approximate €50.000 a year is spent on the secondment of two early career researchers, institutional support from the Lab team, and all overheads.

Events

Events such as introducing competitions and fellowships, the hosting of hackathons or symposia, can be core Lab activities; introducing Lab innovations and experiments to a public audience comes with a variety of costs, for people, venues, food, and equipment, as shown

below in the diagram. Event budgets should form a key part of the Lab budget if the hosting of events are part of its plan.



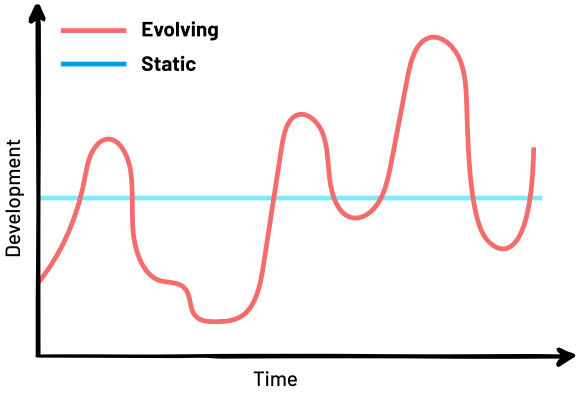
Division of expenses

Sustainability

A difficult yet crucial question is how to ensure Labs are sustainable. Having said that, a Lab's components may not need to be sustainable at all, and a Lab's sustainability need not necessarily be a measure of success. The goal(s) of the specific Lab in question help(s) to define what kind, and to which degree, sustainability is relevant.

Sustainability versus continuity

First, it is important to draw a distinction between sustainability and continuity. Where a sustainable Lab is a living organism — possibly growing, but more likely evolving — a continuous Lab is static. It will be managed, its activities will be done, but no effort is put into the development of the Lab organisation. In this case it might be questionable whether the Lab is really a Lab or simply a Lab-branded activity. The diagram below demonstrates the difference between a static, non-evolving team and a constantly changing, growing Lab — including successes and failures.



Difference between sustainability and continuity

Thinking about sustainability

Defining the goals of a Lab at an early stage, described in Chapter 4, also creates an opportunity to discuss its sustainability and future. Naturally, those goals might include a variety of levels of sustainability and so will the resulting services and activities. However, it should be clear from the beginning to which degree, and in which form, sustainability is a goal to strive for and what the required actions and consequences will be when the Lab or particular aspects are not sustained.

Examples of sustainability success

- **Goal: Introducing Research and Development (R&D) into the organisation**

When a Lab is set up as the R&D hub of an organisation, it is crucial that sustainability is a priority, especially with regards to the organisational setup of the Lab and its team. It should be(come) an independent part of the organisation, yet be implemented inclusively. It is important that there is a financial and strategic commitment from the institution (i.e. buy-in) from the implementation of the Lab if it is to be sustainable in to the long-term.

- **Goal: Clustering (new) research activities**

The term Lab is frequently used to signify activities that originally have no specific place in the organisation, such as data delivery and externally funded research projects. These Labs are essentially conducting business as usual and are required to plan how longer-term implementation can be achieved, once their scope and requirements are clarified. Regarding sustainability of these research activities, it may be more about emerging into the organisation than it is about having or sustaining an actual Lab.

- **Goal: Changing the mindset of the organisation**

A Lab can be used as an instrument of change as it requires a different way of working: within teams, with the collections, and also with external partners. If the goal of the Lab is to initiate this change in working, the Lab is to be absorbed back into the institution: this is a form of sustainability in itself as the Lab's knowledge and culture remains.

- **Goal: Working with users**

When a Lab is set up in order to have space to collaborate with users, sustainability is very important to consider as external partners might be dependent on the Lab. If this dependency is not desirable, the temporary or ad-hoc nature of the Lab needs to be clearly communicated to its users.

Case Study: The evolution of the KB Lab

The KB Lab of the KB National Library of the Netherlands was officially launched in June 2014 and has changed and evolved since. This case study describes its evolution with special regard to the subject of sustainability.

Original proposal

The Lab was **proposed** to KB's management in October 2013. The proposal was developed in 2013 by an internal working group discussing the need, scope and possibilities of having a Library Lab. The Lab was originally designed to showcase research department activities, internal prototypes and externally developed tools, in addition to working well with KB collections. The proposal further envisioned a physical Lab space for researchers, offering technical infrastructure to bring together pieces of software and demonstrations originally spread out across hosting services of the KB and its partners.

Researcher-in-residence

The projects of the embedded researchers were initiated shortly after the launch of the Lab under the name **Onderzoeker te Gast**. With this programme, early career researchers were invited (and funded) to join the Lab for a period of up to six months to collaborate with the team on a project of their proposal. The first three projects (September 2014 to June 2015) were set up as pilots with a lightweight selection process. An evaluation was also built in with a 'Go / No Go' moment. After these pilot projects the Lab continued the programme with slight alterations. A call for proposals and a submission form were introduced in the process, using a selection committee of external partners. Also, two instead of three placements were decided on. Since then, other small adaptations have been made, such as the introduction of a current researcher-in-residence on the selection committee, and the decision to accept independent researchers into the programme.

Lab spaces

A physical dedicated space has not been set up. However, the embedded researchers work in the offices of the research department and the general rooms of the KB have been used for Lab events.

The virtual space of the Lab however has grown quite a bit. It went from a small server to two larger ones and from having a hacked-together website to a designed web presence within the KB web domain at https://lab.kb.nl/. The development of the new website in 2016 meant **the goals and user groups** of the Lab were being revisited and sharpened to the current needs.

Sustainability

When the KB Lab was introduced in 2014, a new policy plan was being developed. The Lab was not specifically mentioned in the previous **strategic plan** of the library, but an important paragraph provided the backing of the organisation and the freedom to develop the Lab:

'They are researchers and developers who use the large textual datasets that the KB has built up with its partners during the past few years. More and more humanities researchers use tools to extract information and visualise data, to get a grip on datasets that can no longer be analysed in the traditional way (big data). The KB actively supports this form of Humanities, Digital Humanities' (p. 10).

The development of the Lab has since then produced tools, datasets, made new connections, joined networks, and collaborated in externally funded projects. This has led to the current **strategic plan (2019-2022)**, which states:

'In addition to the results of mass digitisation, we also grant access to controlled data collections for research purposes, such as data from the Dutch Bibliography and the DBNL corpus. We work alongside researchers in the KB LAB to develop new knowledge and tools for use with our digitised collection' (p. 16).

The fact that the KB provided the KB Lab with a safe environment by offering sustainable funding, an integrated part in the policy plans and organisation in which to work, meant the Lab had to chance to develop into what fits the KB. Experiments were encouraged and lessons learned (also negative) seen as valuable additions to the business. In the coming years, the KB Lab team will continue the conversation with the organisation on how to move from prototype and research to business as usual.

Retirement and decommission

As discussed in the previous chapter, a Lab and its components do not have to be sustained. By thinking about sustainability — and the possible lack thereof — in the design process of the Lab, steps can be put in place for a time when the decision is made to retire a Lab or its activities or outputs.

Stopping an activity

A specific activity might not be relevant and suitable for a Lab in the long term. This may happen more often than in the daily business of the organisation due to the flexible and experimental nature of Labs. Having a step-by-step guide helps finalise the output and make it easier to stop the activity in a productive and concrete manner.

Retiring the Lab

If a Lab is to be decommissioned, two main options come to mind:

1) Integrating the activities of the Lab into the parent organisation.

When a Lab's funding ends or there is no more need for standalone Lab-style work in the parent organisation, the Lab activities and team can be transferred to the parent organisation. It is pertinent to map each activity and the strengths of the team to ensure a good fit within the organisation. Staff may leave as a result, as it is the nature of the Lab-style work rather than the institution that attracted them to the job in the first place. If this happens, preserving their knowledge within the organisation is key.

2) Finalising all output, storing it for preservation.

Ideally when a Lab is to be shut down, its staff and services are integrated into the organisation. However, when that is not possible, all outputs and services might have to be resolved. Closing a Lab does not mean the user community disappears. A closure is a sensitive matter for everyone involved and should be approached with the utmost care. As people are the crucial factor in a Lab, their needs should be considered and their work and knowledge preserved. A plan as to how to ensure this preservation should be communicated openly and outputs from the Lab made available to the user community for as long as possible.

Key points

Funding and sustaining a GLAM Lab:

- Involves making decisions about the trade-offs between short-term and long-term funding options.
- Means distinguishing between continuity and sustainability, and allowing for evolution of the Lab and its goals.
- Means considering budgeting questions such as staff, operational costs, hardware and software, fellows, events and the occasional coffee.
- May lead to retiring individual activities or even decomissioning the whole Lab, which involves making decisions about preserving outputs and transferring services to other departments.

Into the Future with GLAM Labs

Into the future with GLAM Labs

GLAM Labs are one of the most significant and disruptive influences on cultural heritage organisations in the age of digital production and transformation. All over the world, institutions are witnessing the value and dynamism Labs bring to their collections, making them more accessible, used, shared and enjoyed by their users. Labs are living, progressive and transformational. They push boundaries, open up new perspectives, create content and encourage engagement with communities.

People who work in Labs are passionate and energetic. They explore and exploit innovative technologies, push them to their limits, break, fix, mix and publish them, and this is what makes these Labs such a strong community force and a driver of change. Machines alone cannot do what Labs do; human-centred creative skills make technologies truly engaging, useful and inspirational.

Embracing openness can be challenging but it is essential for the Lab's success and requires bold commitment. It invites collaboration, which is a catalyst for transformational change throughout the GLAM sector. Shared experiments, innovation and development in Labs helps institutions to explore their next steps, to improve services, collections, methods and approaches.

Technology is going to continue to change at a pace that can be hard for people and institutions to follow — but it is inevitable that they do. Labs explore, experiment and prepare for wide-scale adoption of emerging technologies, creating value from what can be an uncomfortable, fast-paced technological change.

Labs are the missing link between technology, people and communities. If Labs are supported and empowered, GLAMs and their communities will benefit from a more connected, open, innovative and inclusive future.

Open a GLAM Lab!

Annexes

Bibliography and further reading

Agile software development. In Wikipedia. **https://en.wikipedia.org/wiki/Agile_software_development** (Accessed on 28 September, 2019).

Angelaki, G., Badzmierowska, K., Brown, D., Chiquet, V., Colla, J., Finlay-McAlester, J., & Werla, M. (2019) *How to Facilitate Cooperation between Humanities Researchers and Cultural Heritage Institutions*. Guidelines. Warsaw, Poland: Digital Humanities Centre at the Institute of Literary Research of the Polish Academy of Sciences. **http://doi.org/10.5281/zenodo.2587481** (Accessed on 28 September, 2019).

Baker, S. (2019) The Audience Impact Model and Interpretation *AUT Library Summer Conference*. Available: **https://ojs.aut.ac.nz/lsc/index.php/LSC/article/view/3** (Accessed on 28 September, 2019).

Bogaard, T., Hollink, L., Wielemaker, J., Hardman, L. & van Ossenbruggen, J.R. (2019) *Searching for old news: User interests and behavior within a national collection*. In *CHIIR '19 Proceedings of the 2019 Conference on Human Information Interaction and Retrieval* (pp. 113–121). **https://research.vu.nl/en/publications/searching-for-old-news-user-interests-and-behavior-within-a-natio** (Accessed on 28 September, 2019).

Brooks, M., & Heller, M. (2013) *Library labs. Reference & User Services Quarterly*, 52(3), 186-190.

Candela, G., Escobar, P., Carrasco, R., Marco-Such, M. (2018) *Migration of a library catalogue into RDA linked open data*. Semantic Web 9(4): 481-491. Pre-print Available: **http://www.semantic-web-journal.net/system/files/swj1453.pdf** (Accessed on 28 September, 2019).

Chambers, S., Mahey, M., Gasser, K., Dobreva-McPherson, M., Kokegei, K., Potter, A., Ferriter, M., and Osman, R. (2019) *Growing an international Cultural Heritage Labs community*. Libraries as Research

Partner in Digital Humanities, Digital Humanities Pre-conference Workshop, KB, National Library of the Netherlands, The Hague. 8 July 2019. Available: **http://doi.org/10.5281/zenodo.3271382** (Accessed on 28 September, 2019).

Chambers, S. (2019) *Library Labs as experimental incubators for Digital Humanities research*. Presented at: 23rd International Conference Theory and Practice of Digital Libraries (TPDL 2019), OsloMet - Oslo Metropolitan University, Oslo, Norway, 9-12 September, (2019) Available: **https://docs.google.com/presentation/d/1GcqB1VNtHH9z3vEPi6r8zEQOpQcXQu33dGffDzatDp8/edit?usp=sharing** (Accessed on 28 September, 2019).

Cooper, E. (2019) *The World Wide Lab: Building Library Labs - Part II*. Digital Scholarship Blog. The British Library.
Available: **https://blogs.bl.uk/digital-scholarship/2019/02/the-world-wide-lab-building-library-labs-part-ii.html** (Accessed on 28 September, 2019).

Dobreva, M., O'Dwyer, A., Feliciati, P. (2012) *User Studies in Digital Library Development*. Facet Publishing, London.

Dobreva, M., Phiri, F. (2019) *Cultural Heritage Innovation Labs in Africa*. figshare. Dataset. Available: **https://doi.org/10.5522/04/9685127.v1** (Accessed on 28 September, 2019).

Elves, R. (2017) *Innovation in libraries: Report from the Business Librarian Association annual conference*, SCONUL Focus 68, p.89
https://www.sconul.ac.uk/sites/default/files/documents/Focus%2068.pdf (Accessed on 28 September, 2019).

Escobar, M. P., Candela, G., Marco, M., Carrasco, R. (2017) *Improving access to Culture Heritage: data.cervantesvirtual.com.* Presented at: WikidataCon 2017: **https://www.wikidata.org/wiki/Wikidata:WikidataCon_2017/Submissions/Improving_access_to_Culture_Heritage:_data.cervantesvirtual.com** (Accessed on 28 September, 2019).

European Commission report on Cultural Heritage: Digitisation, Online Accessibility and Digital Preservation. Report/Study. 12 June 2019. **http-**

s://ec.europa.eu/digital-single-market/en/news/european-commission-report-cultural-heritage-digitisation-online-accessibility-and-digital (Accessed on 28 September, 2019).

Ferriter, M. (2019) *Design Principles for System Features & Capabilities.* Available: **https://github.com/LibraryOfCongress/concordia/blob/master/docs/design-principles.md** (Accessed on 28 September, 2019).

Gallinger, M., and Chudnov, D. (2016) *Library of Congress Lab*. Library of Congress Digital Scholar's Lab Pilot Project: **https://labs.loc.gov/static/portals/labs/meta/images/DChudnov-MGallinger_LCLabReport.pdf** (Accessed on 28 September, 2019).

Gryszkiewicz, L., Toivonen,T. & Lykourentzou, I. (2016) *Innovation Labs: 10 Defining Features, Stanford Social Innovation Review Nov. 3*. **https://ssir.org/articles/entry/innovation_labs_10_defining_features** (Accessed on 28 September, 2019).

Harnessing the Power of AI: The Demand for Future Skills (2019) **https://www.robertwalters.co.uk/hiring/campaigns/harnessing-AI.html** (Accessed on 28 September, 2019).

Heller, L. and Brinken, H. (2018) *How to run a book sprint – in 16 steps*. LSE Impact Blog. **https://blogs.lse.ac.uk/impactofsocialsciences/2018/11/20/how-to-run-a-book-sprint-in-16-steps/** (Accessed on 28 September, 2019).

Koster, L., Woutersen-Windhouwer, S. (2018) *FAIR Principles for Library, Archive and Museum Collections: A proposal for standards for reusable collections*, The Code4Lib Journal, (40), available: **https://journal.code4lib.org/articles/13427** (Accessed on 28 September, 2019).

Library Carpentry, **https://librarycarpentry.org/** (Accessed on 28 September, 2019).

ISO 9241-210:2019 (2019) *Ergonomics of human-system interaction - Part 210. Human-centred design for interactive systems.*

Laursen, D., Roued-Cunliffe, H., & Svenningsen, S. R. (2018) *Challenges and perspectives on the use of open cultural heritage data across four different user types: Researchers, students, app developers and hackers.* In *Digital Humanities in the North* (Vol. 2084, pp. 412-418).

Magruder, M. T. (Ed.) (2019) *Imaginary Cities*, London, UK, The British Library.

Mahey, M. (2018) *Building Library Labs around the world - the event and complete our survey!* Digital Scholarship Blog. The British Library. Available: **https://blogs.bl.uk/digital-scholarship/2018/09/building-library-labs-around-the-world.html** (Accessed on 28 September, 2019).

Mahey, M. and Dobreva-McPherson, M. (2019) *Invitation to join 'Digital Cultural Heritage Innovation Labs Book Sprint'*, Doha, Qatar, 23-27 September 2019. Digital Scholarship Blog. The British Library. Available: **https://blogs.bl.uk/digital-scholarship/2019/07/invitation-to-join-digital-cultural-heritage-innovation-labs-book-sprint-doha-qatar-23-27-september-.html** (Accessed on 28 September, 2019).

Mahey, M. (2019a) *Imaginary Cities: Building a Conversation with British Library Labs* in Magruder, M. T. (Ed.) (2019) *Imaginary Cities*, London, UK, The British Library.

Mahey, M. (2019b) *Labbers of the world unite to write a book in 1 week through a Book Sprint*. Digital Scholarship Blog. The British Library. Available: **https://blogs.bl.uk/digital-scholarship/2019/09/labbers-of-the-world-unite-to-write-a-book-in-1-week-through-a-book-sprint.html"** (Accessed on 28 September, 2019).

McGregor, N. (2018) *Building Library Labs - Summary Survey Responses*. Available: **https://docs.google.com/presentation/d/1yg72727ak9EGLHzkN3ogHSQ6CMK3WlRgfuSRElfPH_E/edit?usp=sharing** (Accessed on 28 September, 2019).

McGregor, N., Ridge, M., Wisdom, S., Alencar-Brayner, A. (2016) *The Digital Scholarship Training Programme at British Library: Concluding Report & Future Developments*. In *Digital Humanities 2016: Conference*

Abstracts. Jagiellonian University & Pedagogical University, Kraków, pp. 623-625.

Meyrick, J., Phiddian, R., Barnett, T. (2018) *What Matters? Talking Value in Australian Culture*. Clayton, Australia, Monash University Publishing. Available: **http://theconversation.com/beyond-bulldust-benchmarks-and-numbers-what-matters-in-australian-culture-101459** (Accessed on 28 September, 2019).

Moiraghi, E. (2018) *Le Projet Corpus et ses publics potentiels. Une étude prospective sur les besoins et les attentes des futurs usagers*. BnF. **https://hal-bnf.archives-ouvertes.fr/hal-01739730** (Accessed on 28 September, 2019).

Neudecker, C. (2018) *Building library labs - what do they do and who are they for?* EuropeanaPro website. Available: **https://pro.europeana.eu/post/building-library-labs-what-do-they-do-and-who-are-they-for** (Accessed on 28 September, 2019).

Nowviskie, B. (2013) *Skunks in the Library: A Path to Production for Scholarly R&D*, Journal of Library Administration, 53:1, 53-66, DOI: **10.1080/01930826.2013.756698** (Accessed on 28 September, 2019).

Padilla, T., Allen, L., Frost, H., Potvin, S., Russey Roke, E., Varner, S. (2019) *Final Report - Always Already Computational: Collections as Data*, Available: **https://doi.org/10.5281/zenodo.3152935**, **https://osf.io/mx6uk/wiki/home/** (Accessed on 28 September, 2019).

Parcell, L. (2019) *Creating the library of the future*. 3 May 2019. JISC Blog. **https://www.jisc.ac.uk/blog/creating-the-library-of-the-future-03-may-2019** (Accessed on 28 September, 2019).

Posner, M. (2012) *What are some challenges to doing DH in the library?* Miriam Posner's Blog. Available: **https://miriamposner.com/blog/what-are-some-challenges-to-doing-dh-in-the-library/** (Accessed on 28 September, 2019).

Rawson, K., Muñoz, T. (2016) *Against Cleaning*. Blog. **http://curatingmenus.org/articles/against-cleaning/** (Accessed on 28 September, 2019).

Simon, N. (2010) *The participatory museum. Museum 2.0.* **http://www.participatorymuseum.org/** (Accessed on 28 September, 2019).

Snickars, P. (2018) *Datalabb på KB: En föstudie*. National Library of Sweden. **http://www.kb.se/dokument/Bibliotek/utredn_rapporter/2018/1.2.1-2017-752.pdf** (Accessed on 28 September, 2019).

The Open Science Training Handbook (2018) **https://book.fosteropenscience.eu/en/** (Accessed on 28 September, 2019).

Unsworth, J. (1999) *The Library as Laboratory*. Annual Meeting of the American Library Association. Session of the ACRL Law and Political Science Section and the ARL Office of Scholarly Communication: 'The Politics of Scholarly Communication in the New Millennium' Sunday, June 27, 1999. Available: **http://www.people.virginia.edu/~jmu2m/ala99.htm** (Accessed on 28 September, 2019).

Vershbow, B. (2013) *NYPL Labs: Hacking the Library*. Journal of Library Administration, 53:79–96, 2013. Available: **https://www.nypl.org/sites/default/files/nypl-labs-hacking-the-library-vershbow-jla_0.pdf** (Accessed on 28 September, 2019).

Wilms, L., Derven, C., O'Dwyer, L., Lingstadt, K., & Verbeke, D. (2019) *Europe's Digital Humanities Landscape: A Study From LIBER's Digital Humanities & Digital Cultural Heritage Working Group.* **http://doi.org/10.5281/zenodo.3247286** (Accessed on 28 September, 2019).

Wickham, H. (2014) *Tidy Data*, Vol. 59, Issue 10, Sep 2014, *Journal of Statistical Software*. **http://www.jstatsoft.org/v59/i10** (Accessed on 28 September, 2019).

Winesmith, K. (2018) *On Collaboration: SFMOMA and Adobe Rethink the Selfie.* Available: **https://www.sfmoma.org/read/on-collaboration-sfmoma-adobe-rethink-selfie/** (Accessed on 28 September, 2019).

Zaagsma, G. (2019) *Digital history and the politics of digitisation*. Presentation at DH Benelux 2019, University of Liège, Belgium: **http://2019.dhbenelux.org/wp-content/uploads/sites/13/2019/08/DH_Benelux_2019_paper_27.pdf** (Accessed on 28 September, 2019).

Acronyms

ALTO - Analysed Layout and Text Object

API - Application Program Interface

BL - British Library

CC - Creative Commons open licences CIDOC - Conceptual Reference Model (CRM)

CILIP - Chartered Institute of Library and Information Professionals

CWI - Centrum voor Wiskunde en Informatica, (Dutch National Research Institute for Mathematics and Computer Science)

CSV - Comma Separated Values

D.C. - District of Columbia

DH - Digital Humanities

DK - Det Kongelige Bibliotek, (The Royal Danish Library)

DOI - Digital Object Identifier

DX Lab - The State Library of NSW experimental Innovation Lab

ETL - Extract, Transform, Load - procedure of copying data from one or more sources into a destination system

EU - European Union

FAIR - Findability, Accessibility, Interoperability and Reusability

FRBR - Functional Requirements for Bibliographic Records

FTE - Full Time Equivalent Staff

GDPR - General Data and Protection Regulations (EU)

GhentCDH - Ghent Centre for Digital Humanities

GLAM - Galleries, Libraries, Archives and Museums

hOCR - Hypertext Optical Character Recognition

HTR - Handwritten Text Recognition

IPR - Intellectual Property issues

ISO - International Organisation for Standardisation

IT - Information Technology

JPEG 2000 - Joint Photographic Experts Group

JSON - JavaScript Object Notation

KB - Koninklijke Bibliotheek, (National Library of the Netherlands)

LC - Library of Congress

MARC - Machine-Readable Cataloguing

MARC formats - Standards for machine-readable representation and communication of bibliographic and related information

METS - Metadata Encoding and Transmission Standard

MPEG 21 - Moving Picture Experts Group 21

NL - Netherlands

NLP - Natural Language Processing

NSW - New South Wales

NYPL - New York Public Library

OCR - Optical Character Recognition

PhD - Doctor of Philosophy

Q&A - Questions and Answers

R&D - Research and Development

RDA - Resource Description and Access

RDF - Resource Description Framework

SA - South Australia

TEI - Text Encoding Initiative

TIFF - Tagged Image File Format

UCL - University College London

UK - United Kingdom

VR - Virtual Reality

XML - eXtensible Markup Language

Data Formats

When working in a Lab, a number of data formats are frequently used. This list is by no means complete, but provides an overview of possible formats.

Images

- **Tagged Image File Format (TIFF)**
- **Joint Photographic Experts Group (JPEG 2000)**

Text

- **Analysed Layout and Text Object (ALTO)** is an XML format describing recognised text and layout of an image. It is often used in collaboration with METS (see below).
- **Hypertext Optical Character Recognition (hOCR)** is an XML format describing recognised text and its location on an image used by open source OCR engines such as Tesseract.
- **Text Encoding Initiative (TEI)** is an XML format used to encode text in detail. It is often used for digital editions.

Data

- **Comma Separated Values** (CSV) is a format used to represent a tabular data in comma separated values.
- **JavaScript Object Notation** (JSON) is a format used to transmit data in a human-readable manner.
- **eXtensible Markup Language** (XML) is a markup language much like HTML.

Structural metadata

- **Moving Picture Experts** (MPEG21) is an XML format which describes the structure of a digital object. It is often combined with the **Digital Item Declaration** (DIDL) to describe the structure.

- **Metadata Encoding and Transmission Standard** (METS) is an XML format which describes the structure of a digital object. It is often used in collaboration with ALTO (see above).

Bibliographic metadata

- **Functional Requirements for Bibliographic Records** (FRBR) is a conceptual model developed by the International Federation of Library Associations and Institutions (IFLA) which is focused on user tasks of retrieval and access in online library catalogues from a user-centred perspective.

- **Bibframe** was initiated by the Library of Congress in order to replace MARC standards and to adopt the linked data principles.

- **Resource Description and Access** (RDA) is a package of data elements, guidelines, and instructions for creating library and cultural heritage resource metadata that are well-formed according to international models for user-focused linked data applications.

- **Bibliographic Ontology** (BIBO) provides main concepts and properties for describing citations and bibliographic references (i.e. quotes, books, articles, etc.) on the Semantic Web.

Museum metadata

- **Lightweight Information Describing Objects** (LIDO) is an XML harvesting schema which supports a full range of descriptive information about museum objects.

Archival metadata

- **Encoding Archival Description** (EAD) is an XML standard for encoding archival finding aids.

Cultural Heritage Metadata

- **Europeana Data Model** (EDM) is the formal specification of the classes and properties that could be used in Europeana, the EU digital platform for cultural heritage.
- **CIDOC Conceptual Reference Model** (CRM) provides definitions and a formal structure for describing the implicit and explicit concepts and relationships used in cultural heritage documentation.

Colophon

Fonts: Paytone One for the titles and Carter One for captions by Vernon Adams, and Open Sans by Steve Matteson

Book Sprints (**www.booksprints.net**) team:

- Laia Ros (Facilitator)
- Lennart Wolfert (Illustrator)
- Agathe Baëz (Book producer)
- Raewyn Whyte and Christine Davis (Copy editors)

ISBN 978-164606142-6