



University of Oxford Gardens, Libraries and Museums Digital Strategy

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EXECUTIVE SUMMARY

Oxford University's collections, based in its Gardens, Libraries and Museums (GLAM), are of universal significance, representing the history, science, culture and knowledge of all major global civilisations. They are essential resources of cultural, intellectual and scientific materials for research, scholarship and education in the broadest sense – in Oxford, nationally and internationally.

Our vision is to utilise the opportunities offered by digital to democratise access to the collections, eliminating geographic, cultural and economic boundaries. Our ambition is for full machine-readable metadata and digital surrogates of all our unique collections to be available and discoverable online, and for these digital assets to be preserved and safeguarded for future generations. GLAM institutions are interdisciplinary by nature, and their services already underpin research and teaching at the University. Fulfilling the ambitions set out in this strategy will enable GLAM to facilitate further research, teaching, lifelong learning and public engagement, and encourage new collaborations and experimentation, both now and in the future.

The diversity and size of the collections means a single vision for digital across the collections must of necessity be high-level in nature. Certain principles can, however, apply across the collections and represent the shared aspirations of GLAM:

1. All collections should be easily discoverable online, through the provision of high-quality metadata.
2. All unique analogue collections should ultimately have a digital surrogate.
3. The collections will continue to develop through the acquisition and creation of born-digital material, as well as through the digitisation of existing material.
4. The collections will be easily useable for digital teaching and research, and GLAM will actively seek opportunities to participate in this activity.
5. GLAM will utilise the collections to support the University's widening participation and public engagement agendas, engaging new and diverse public audiences locally, nationally and internationally.
6. The collections will be created, managed and preserved in a manner which allows for their sustainable long-term use and reuse, that is efficient and cost effective, and that is secure, robust and resilient, safeguarding the investment made to create them in the first place.
7. GLAM will govern publication and reuse of the collections based on a shared IPR policy that aims to make material readily accessible in the public domain and encourage the widest possible reuse and engagement, while enabling GLAM to use its digital assets to support its institutions commercially.
8. GLAM will develop commercial approaches and partnerships where appropriate in order to grow existing and develop new income streams to ensure the sustainability of its operations.

In order to achieve the ambitions outlined above, and support the step change in digital capacity that this will entail, GLAM will require:

- 1. Capital:** significant capital investment through a series of projects to replace dated hardware and systems and establish new systems and processes. This is crucial to provide GLAM with a stable infrastructure that also allows it to function at the cutting edge and respond with agility to the rapidly changing digital landscape (IT Capital Fund).
- 2. Project funding:** a series of specially funded cataloguing and digitisation projects in order to increase the proportions of the collections that have metadata and digital surrogates. This will prioritise collections of particular academic or public interest, or which face conservation risks. This investment must include mass digitisation activity; collections must provide a minimum level of content in order to support current research and engagement needs and demonstrate impact to attract additional digitisation funding.
- 3. Recurrent funding:** an increased allocation of operational capacity to maintain the new digital services and assets created, and to ensure that organisational capacity is focused on boosting the prioritised areas of activity outlined in this document (ie additional recurrent funding).

In addition to securing capital and project investment, existing and new operational resource for digital across GLAM will need to undergo significant development and transformation to support the step change identified in this document.

Strategic oversight is a priority area for investment. Many of the GLAM institutions lack adequate high-level IT and digital posts to offer appropriate oversight and strategic direction; these gaps must be filled. Moreover, as GLAM takes an increasingly collaborative approach, GLAM-wide, high-level strategic oversight is required to ensure that individual projects are complementary and build towards agreed shared goals.

GLAM must also rebalance investment to increase digital capacity to manage the increasing scale and complexity of its digital collections and operations, and in particular to manage the move from project-based to programmatic activity. Knowledge and expertise must also be spread across the organisations as digital increasingly impacts on every aspect of our work. Alongside dedicated digital curation, collections and engagement posts, digital responsibilities must be incorporated into existing job descriptions and posts, and appropriate CPD offered to enable staff to adapt to the new demands of their role.

INTRODUCTION

Oxford University's collections, based in its Gardens, Libraries and Museums (GLAM), are of global significance, representing the history, science, culture and knowledge of all major global civilisations. They are essential resources of cultural, intellectual and scientific materials for research, scholarship and education in the broadest sense. GLAM has embraced digital technologies to support its work for many years. Oxford's GLAM institutions have engaged in mass digitization activities, placed collection catalogues and finding aids online, supported new forms of scholarship using digital technologies, and engaged with the public through digital means. Despite innovative, sector-leading practice in all parts of GLAM, much work remains to be done to support the breadth and depth of work demanded of GLAM from students, scholars and the general public, and to enable the safe and secure stewardship of the collections in digital form.

This strategy identifies shared aims and activities that the GLAM institutions will undertake in order to advance, jointly and severally, their own missions as leading institutions, and to support together the research, teaching and public engagement objectives of the University as a whole.

VISION FOR DIGITAL ACROSS GLAM

Our vision is to utilise the opportunities offered by digital to democratise access to the collections. Our ambition is for full machine-readable metadata of all collections and digital surrogates of all unique collections to be available and discoverable online, and for these digital assets to be preserved and safeguarded for future generations. GLAM institutions are interdisciplinary by nature, and their services already underpin research and teaching at the University. Fulfilling the ambitions set out in this strategy will enable GLAM to facilitate further research, teaching, lifelong learning and public engagement, and encourage new collaborations and experimentation, both now and in the future.

The diversity of the collections, which are held at massive scale (12 million printed books, 25 km of manuscripts and archives, 8.5 million museum objects, 30,000 botanical specimens, approaching petabyte scale for digital collections), means a single vision for digital across the collections must of necessity be high level in nature. Certain principles can, however, apply across the collections and represent the shared aspirations of GLAM:

1. All collections should be easily discoverable online, through the provision of high-quality metadata.
2. All unique analogue collections should ultimately have a digital surrogate.
3. The collections will continue to develop through the acquisition and creation of born-digital material, as well as through the digitisation of existing material.
4. The collections will be easily useable for digital teaching and research, and GLAM will actively seek opportunities to participate in this activity.
5. GLAM will utilise the collections to support the University's widening participation and public engagement agendas, engaging new and diverse audiences locally, nationally and internationally.

6. The collections will be created, managed and preserved in a manner which allows for their sustainable long-term use and reuse, that is efficient and cost effective, and that is secure, robust and resilient, safeguarding the investment made to create them in the first place.
7. GLAM will govern publication and reuse of the collections based on a shared IPR policy that aims to make material readily accessible in the public domain and encourage the widest possible reuse and engagement, while enabling GLAM to use its digital assets to support its institutions commercially.
8. GLAM will develop commercial approaches and partnerships where appropriate in order to grow existing and develop new income streams to ensure the sustainability of its operations.

Following a brief review of background and context, this document outlines the resources required to achieve the ambitions articulated in this document. This is followed by GLAM's detailed aims, aspirations and priorities under the headings: [Digitisation](#); [Search and discovery](#); [Digital teaching and research](#); [Digital engagement](#); [Digital preservation](#); and [Digital estate](#).

BACKGROUND AND CONTEXT

Digital developments across GLAM have grown organically over the past thirty years. GLAM itself is a relatively new grouping of institutions, each with their own rich and distinct histories, user communities and approaches to their professional work. The plan to develop a University Digital Strategy provides the opportunity for GLAM to review its approaches and a powerful impetus to drive forward the University's overarching strategy.

GLAM's digital strategy is ideally placed to support research and teaching across all divisions of the University, while providing innovative means to engage with broader sections of the public locally, national and internationally. As more of its collections become discoverable online, as the tools and services mature and develop to meet the demands of new audiences, and as the infrastructure to support this work becomes more robust and resilient, GLAM will be at the heart of supporting the academic mission for the University in the 21st century. Delivery of GLAM's Digital Strategy is essential to GLAM fulfilling its overall strategic goals:

- Ensure excellence in the care and curation of unique University of Oxford collections (GLAM Priority 1)
- Provide optimum access to and engagement with the collections (GLAM Priority 2)
- Ensure partnership and collaboration in the development of the GLAM community (GLAM Priority 3)
- Provide sustainability and resilience (GLAM Priority 4).

RESOURCES

In order to achieve the ambitions outlined above and support the prerequisite step change in digital capacity, GLAM will require:

- **Capital:** significant capital investment through a series of projects to replace dated hardware and systems and establish new systems and processes. This is crucial to provide GLAM with a stable infrastructure that also allows it to function at the cutting edge and respond with agility to the rapidly changing digital landscape (IT Capital Fund).
- **Project funding:** a series of specially funded cataloguing and digitisation projects in order to increase the proportions of the collections that have metadata and digital surrogates. This will prioritise collections of particular academic or public interest, or which face conservation risks. This investment must include mass digitisation activity; collections must provide a minimum level of content in order to support current research and engagement needs and demonstrate impact to attract additional digitisation funding.
- **Recurrent funding:** an increased allocation of operational capacity to maintain the new digital services and assets created, and to ensure that organisational capacity is focused on boosting the prioritised areas of activity outlined in this document (ie additional recurrent funding).

In addition to securing capital and project investment, existing and new operational resource for digital across GLAM will need to undergo significant development and transformation to support the step change identified in this document.

Strategic oversight is a priority area for investment. Many of the GLAM institutions lack adequate high-level IT and digital posts to offer appropriate oversight and strategic direction; these gaps must be filled. Moreover, as GLAM takes an increasingly collaborative approach, GLAM-wide, high-level strategic oversight is required to ensure that individual projects are complementary and build towards agreed shared goals.

GLAM must also rebalance investment to increase digital capacity to manage the increasing scale and complexity of their digital collections and operations, and in particular to manage the move from project-based to programmatic activity. Knowledge and expertise must also be spread across the organisations as digital increasingly impacts on every aspect of our work. Alongside dedicated digital curation, collections and engagement posts, digital responsibilities must be incorporated into existing job descriptions and posts, and appropriate CPD offered to enable staff to adapt to the new demands of their role.

PRIORITIES

DIGITISATION

Transformation of collections into digital form is essential for the management and preservation of these treasures of cultural and scholarly heritage for current and future generations. The provision of universal access to the University collections is needed to support new forms of research, teaching and wider engagement at regional, national and global scales.

Despite major digitisation projects, only a small proportion of the collections have been digitised to date. This reflects the extraordinary scale of the Oxford collections.

	ASH	BOD	OBG	MHS	MNH	PRM
Collection size	1M	12M	30K	45K	6.25M	650K
Digital record (metadata)	330K /36%	12M	20%	40K /89%	152K /2.4%	430k /65%
Digital surrogate	60K /6%	350K (220m pages) / 3%	15%	8K /18%	15K /0.24%	240K /35%

Table 1 - Proportion of GLAM collections with available digital metadata and surrogates

Programmatic digitisation of unique collections is an essential prerequisite to the Search and [discovery](#), [Digital engagement](#) and [Digital research and teaching](#) aims of the GLAM Digital Strategy, increasing the visibility of the University collections and their significant role in the creation, preservation and discovery of knowledge.

GLAM will:

- Create digital data for the management and discovery of the collections and their digital surrogates.
- Create digital surrogates of the physical collections in relevant formats such as images, text, audio, film, and 3D, conforming to industry standards. We will foster the creation of high-quality digital material (and enhancement of existing digital assets) to a shared standard through programmatic digitisation activity and the development of sustainable funding models to enable this.
- Explore opportunities such as cross-collection digitisation projects and the retro-conversion of existing analogue materials in addition to the creation of born-digital materials, new technologies for data capture, crowdsourcing, outsourcing and collaboration.

- Invest in technologies, systems and services for the creation, management, preservation, reuse and commercial exploitation of our digital collections, and for innovation in all aspects of GLAM's digital work (see [Digital estate](#)).

These steps will enable GLAM to make metadata creation and digitization a mainstream activity, integral to the curatorial process, supplemented by a series of externally funded projects as necessary.

In order to ensure that all digitised materials meet a minimum required standard in terms of the format and quality of both surrogates and supporting metadata, GLAM will establish a framework for digitisation based on shared standards and appropriate workflows and processes. Digitisation responsibilities should be included in the job descriptions of staff across GLAM, where appropriate. Each organisation will also require management capacity to coordinate digitisation activity, prioritise work and ensure that all digital assets produced meet the agreed standards.

GLAM should incorporate digital requirements into their development activities.

SEARCH AND DISCOVERY

The University of Oxford is defined by the world-class nature of its research and education. A key driver of this status is the consumption and production of intellectual assets including publications and data, teaching resources, library resources and museum collections. Being able to easily find and use these resources is critical to the leading research and teaching which takes place at Oxford. The Bodleian Libraries provides SOLO (Search Oxford Libraries Online) as the main discovery tool for accessing over 15 million collection items spread across 102 libraries. A further series of specialised interfaces provide access to catalogues listed on websites, and both physical and digital collections held by the four museums, the Botanic Gardens and other specialised library collections. In addition to Oxford's vast physical collections, Oxford's digital collections approach petabyte scale.

Although some collections, resources and expertise are catalogued and listed in great detail, they are often not optimised for digital access or even made available online; they can be hard to find, take many diverse forms and therefore are not suited to discovery by potential users, who increasingly seek access across existing silos.

The challenge therefore at Oxford is to provide a high-quality, user-friendly, mobile-enabled experience which puts all physical resources, electronic resources and digitised content at the fingertips of users. Given the variability in description that exists and the heterogeneous nature of the resources, this is a complex challenge.

In order to ensure that Oxford resources and collections are discoverable online and accessible by researchers, students and the public, GLAM will:

- Invest in researching, piloting, testing and implementing new resource search and discovery tools that facilitate search and retrieval for both students and academic specialists and the broader public.
- Explore opportunities to provide more descriptive metadata through project work, research placements, crowdsourcing, public participation and other innovative means.
- Develop the appropriate infrastructure to hold, manage and retrieve descriptive metadata – for example collection management systems that hold collection records for each museum– and an archival search and retrieval facility for library and museum special collections.
- Exploit opportunities to use semantic approaches and linked data to describe and expose collections wherever possible.
- Ensure that all online services delivered by GLAM have been optimised for indexing by search engines.
- Assess cataloguing backlogs and seek new opportunities for funding to describe collections (see also [Digitisation](#)).

DIGITAL RESEARCH AND TEACHING

GLAM aims to support researchers at the University of Oxford, their research collaborators, academics and professionals at other HEIs and equivalent institutions both nationally and internationally, as well as the public through active engagement in digital research and teaching. This requires fundamental steps to enable such new forms of scholarship to take place, especially through the provision of digitised content and appropriate metadata in a technical framework with associated services and tools. The requirements from Government and research funders make it imperative that digital scholarship at Oxford operates in accordance with open access and open data principles where appropriate.

Accordingly, GLAM will:

- Develop infrastructure that enables efficient and effective digital scholarship, based on GLAM's digital collections and metadata (see [Digitisation](#)).
- Acquire collections in digital form where possible and appropriate, and create digital surrogates of physical collections to enable digital scholarship.
- Develop services and tools to support digital scholarship, such as data mining, text mining and visualisation.
- Support researchers in using and exploiting new digital and data-intensive research methods through specialist digital research centres such as the new Centre for Digital Scholarship in the Weston Library, which is a generative space for training, debate, collaboration and dissemination.
- Continue to maintain, develop and improve the Oxford University Research Archive (ORA, <http://ora.ox.ac.uk>), as the place of record for the outputs of research from

Oxford authors, including journal articles, conference proceedings, theses, book chapters and other works.

- Ensure that Oxford researchers can comply with requirements from funding bodies where open access requirements have been mandated.
- Develop a sustainable funding mechanism and strategy for the ongoing development of research data management for the long-term preservation of and access to research datasets, in collaboration with Research Services and IT Services.
- Engage the public in research conducted by GLAM through crowdsourcing projects, public dissemination and outreach.
- Engage with new trends and developments in open scholarship, such as open peer review, altmetrics and social networking through innovative projects.
- Engage with research and scholarship in HEIs and equivalent institutions outside of Oxford as part of their contribution to the furtherance of international scholarship.
- Develop a programme of research and that enables allows continuous improvement and encourages GLAM to experiment, adapt and develop its approaches.

DIGITAL ENGAGEMENT

The collections are the public face of the University, drawing over 3 million visitors to our GLAM institutions each year. This is a fraction of digital visits, which either complement a traditional visit or are a unique digital engagement. Consequently, digital is essential to delivering the engagement ambitions and responsibilities of GLAM, to provide access to a broad local, national and international audience, and to ensure that visitor encounters are as inspiring, meaningful and rewarding as possible.

Access depends on transforming the physical collections into digital collections that are fully accessible online (see [Digitisation](#) and [Search and discovery](#) sections). To move from access to effective engagement GLAM must offer meaningful curation, interpretation and services around the collections; it is this content that ensures encounters are inspiring, meaningful and rewarding.

GLAM will:

- Produce digital learning and public engagement resources specially curated for a variety of public audiences including families, children and young people; school groups and teachers (including content tied to the national curriculum); and members of the broader public with varying levels of pre-existing knowledge and from a variety of countries and cultures.
- Deliver digital collections and resources via GLAM websites which, like our physical sites, are user-centric in design, optimising the visitor journey and experience. Further, like our physical spaces, our collection websites should be dynamic and striking in their design and branding.

- Optimise its digital content, collections and services for multiple devices as well as multiple visitor contexts, including unique digital visits (independent of a traditional visit and requiring the same dedicated curation) and the enhancement of physical visits. The latter includes a variety of in-gallery content and services, such as ticketing, digital terminals, interactives and mobile guides, but must also support increasingly prevalent 'bring-your-own-device' visitor behaviours and in-gallery mobile delivery.
- Develop digital services that support and enhance both visitor experience and commercial opportunities. These include sophisticated ticketing services, e-commerce platforms, customer relationship management (CRM) systems, public Wi-Fi access, picture libraries and support for online giving.
- Conduct digital outreach into the community, engaging new audiences wherever they are via platforms such as social media and Wikipedia in order to enhance diversity and accessibility. This activity will include the engagement of visitors in two-way exchanges, inviting them to share their own ideas and assets both informally and through more formal initiatives such as crowdsourcing. GLAM will seek ways to actively utilise user-generated content in order to enhance their offer.
- Use digital strategically to achieve the widest possible impact. GLAM will enable the widest possible dissemination of content through the use of permissive licences. In this way, GLAM collections will enter the wider digital ecosystem and be encountered across the web, thus amplifying engagement.

DIGITAL PRESERVATION

The GLAM institutions collectively hold data and digitised material at petabyte scale, and the rate of growth will inevitably increase. This includes data held on behalf of researchers and institutions in other parts of the University, often in support of compliance with funding requirements and for legal and evidential reasons. The cost of replicating this digital material if it were to be lost would be enormous, and the risk of reputational damage, as well as the damage to the University's activities in research, education and public engagement, would be catastrophic. In recognition of the significant risks associated with digital loss, digital preservation is an essential component of the GLAM digital strategy.

GLAM will:

- Develop preservation plans for all its digital collections, taking a life-cycle management approach. Build and maintain key infrastructure to ensure the secure and safe storage and management of its digital assets, ensuring the integrity, authenticity and validation of stored digital content.
- Identify and implement essential preservation tools to avoid technological obsolescence and ensure digital content can be reliably accessed long into the future.

- Manage risks to preserved content throughout the digital content lifecycle.
- Ensure that data and systems are securely protected.
- Embed digital sustainability as an organisational principle for GLAM.
- Audit its systems, processes, approaches and infrastructure to ensure that its approaches are sound.

DIGITAL ESTATE

Underpinning all of ASUC's digitization, search and discovery, engagement, preservation and digital scholarship activities is its Digital Estate – *a modern, expansive, scalable and robust infrastructure*. Only with this infrastructure will it be possible to continue delivering our existing digital products and services to the highest standard, and to accommodate an ever-growing portfolio for all areas of the Collections. Project funding does not provide the resources required to meet the increasing requirements for digital content access and sustainability that the institution must offer. The Digital Estate can be understood to be constituted by the following four areas:

Infrastructure: at the heart of all the digital services provided by ASUC is the technology and architecture which supports them, and the digital ecosystem in which they exist. GLAM and IT Services will collaborate on building a shared infrastructure capable of delivering preservation and management services, such as the Bodleian-IT Services VIPR system, whilst working alongside IT Services-led projects such as Storage as a Service and HFS Diversification. Through significant investment by the University it will be possible to build a robust and resilient preservation infrastructure, fit for purpose for some years ahead. This requires the best hardware, storage, platforms, networks, security and data architecture, which are maintained, supported and refreshed according to accepted industry standards.

Staffing: appropriate staffing, in terms of capacity and expertise, is vital to enable GLAM to achieve the vision outlined in this strategy document, as well as to function at the cutting edge and have the capacity to be agile and respond to the fast-changing digital landscape. Operational digital capacity must be under constant review to ensure that it is sufficient and fit for purpose. Moreover, as digital becomes increasingly central to ways of working across GLAM, digital skills and responsibilities must be built into new and existing job descriptions across the organisations as appropriate. In order to sustain this way of working all staff must be provided with sufficient and appropriate continuing professional development to enable them to deal with the changing demands of their role, and encourage them to innovate and push boundaries. This must be coupled with clear career development opportunities, enabling staff to attract staff, and retain the valuable staff in which they have made significant investment. This will enable us to continue the tradition of world-class innovation for which the University is renowned.

Digital Services: with ever-growing services being provided by GLAM, it is essential that they be consolidated and managed in the most efficient and cost-effective manner possible. All the collections are burdened by the weight of legacy applications that require individual attention and support in a way which is unsustainable. The goal of digital services will be to achieve rationalisation, standardisation and interoperability of all systems and services offered within our shared Digital Estate.

Sustainability: funder mandates such as those of RCUK oblige the University to maintain access to all research outputs (publications and data sets) for no less than ten years after the end of any given project; this commitment is not reconciled by the limitations put upon public funding to only be spent within the lifespan of a project. Not only do we face challenges with how to achieve this goal, but we must also be prepared for the continuous growth that digital services will inevitably undergo. As such, sustainability is one of the key areas that GLAM will address through moving away from predominance of project funding and towards an operational budget built upon philanthropic endowments, e-commerce, cost recovery and efficiency savings.

Evaluation: GLAM will build evaluation into digital projects and use the data to help guide future plans, allowing our institutions to continuously improve our products and services while maintaining value for money.