Sustaining Our Digital Future:

Institutional Strategies for Digital Content

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Suggested further reading

Sustainability and Revenue Models for Online Academic Resources (2008)

On Building a New Market for Culture: Virtue and Necessity in a Screen-Based Economy (2009)

Sustaining Digital Resources: An On-the-Ground View of Projects Today Case Studies in Sustainability (2009)
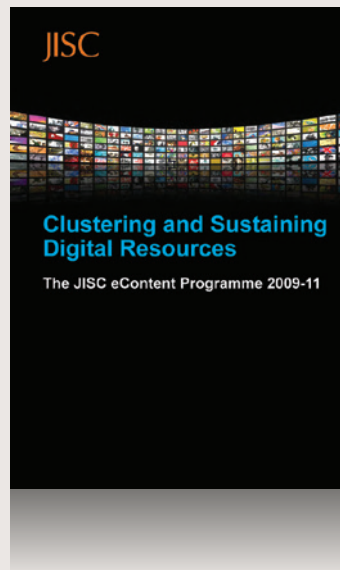
Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources (2011)

Content Clustering and Sustaining Digital Resources (2011)

Sustaining and Embedding Innovations Good Practice Guide (2011)

Sustainability and Revenue Models for Online Academic Resources (2008)

Sustainability and Revenue Models for Online Academic Resources (2008)

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Foreword

What can we learn from others to help us sustain and develop digital content?

As the digital terrain continues to change rapidly, universities, libraries and museums can seem by contrast to be reassuring touchstones. They are stable and trusted institutions with value built up over decades, if not centuries, a refreshing reminder that not everything today becomes obsolete as quickly as a new app replaces the one before. This solid status, whether perceived or real, has helped scholars and library and museum professionals to attract significant investment to create digital content. But how do these institutions understand the responsibility this confers upon them and the opportunities it offers? This is the question that stimulated the commissioning of this study — we wanted to see how academic and cultural institutions have risen to this challenge. What lessons could be learnt from comparing and contrasting these distinct endeavours that are united in their desire to serve the public good while adopting new strategies to ensure their organisational relevance in the digital age?

Our universities are trying to tackle the impact of globalisation on the provision of higher education in an increasingly competitive market. This ranges from overseas universities offering cheaper undergraduate and postgraduate programmes to the development of "massive open online courses", or MOOCs.

Our cultural institutions are seeking innovative means to face the challenge of catering for virtual visitors as well as those who walk through the front door, while creating digital versions of the valuable collections they have devoted considerable effort to amassing.

This examination, both broad and deep, demonstrates different cases of leaders in the process of grappling with change and transformation and seeking new ways to remain vital in an increasingly competitive environment.

We see steps being taken by universities, such as UCL (University College London), to develop effective campus-wide solutions rather than project-centric approaches. In the case of UCL, this is underpinned by its willingness to participate and be actively engaged in our research as one of the case studies. This resulted in UCL identifying a set of issues not previously considered across campus, and taking the necessary steps to address them.

We see our rich and diverse national libraries and museums, illustrated in this report by Imperial War Museums (IWM) and the National Library of Wales (NLW), continue to strive towards developing excellence in digital content and services, albeit at a time of fiscal constraint. The IWM continues to transform its organisational set-up in recognition that digital requires different policies, practices and strategies, while the NLW is a critical component of a Digital Wales. Both have employed a range of tactics and techniques to foster innovative collaboration within the institution.

This study helps us to see not only where practices are quickly evolving for the better, but also areas that might still need attention. As it becomes increasingly important to demonstrate impact, this study encourages institutional leaders to think more broadly of "sustainability" as something well beyond the preservation of content, data and metadata or a particular website. It asks inconvenient questions of relevance, take-up and use in an era when grabbing and holding an audience(s) attention becomes ever harder. That our universities, libraries, museums and others start to recognise and address these issues will be essential if they are to remain relevant to audiences spoilt for choice with content.

We hope that institutional leaders will find useful lessons in this report. We hope it might inspire you to undertake your own inventory of digital content, as did the team at UCL. We hope that, like the team at NLW, you might use the Health Check tool and see what can be learned from asking some tough questions about the status and impact of your digital projects. Mostly, we hope you will find your own ways to apply these findings to your own individual, departmental and/or organisational tactics and techniques in building sustainability strategies for digital content as part of organisational change.

We are grateful to colleagues at the IWM, NLW and UCL for their dedication in making candid and insightful contributions to these research findings. We would like to thank colleagues at Ithaka S&R for this latest in a long history of important studies in this field. We believe their efforts to map this uncharted terrain and to provide guidance to those who need it will be an important step to creating digital content resources that are vital for years to come.

Stuart Dempster, director, Strategic Content Alliance

Executive Summary

Although the most visible signs of our embrace of digital media belong to the world of commercial entertainment and the iPads, e-readers and smartphones we use to consume it, the shift taking place in scholarly communications is proving to be no less transformative. It is not only data sets and scholarly articles that are being created, but dynamic digital resources — websites, digital collections, databases of crowdsourced or born digital content — and they pose opportunities and challenges that are all their own. Aside from the riskiest of experiments in digital innovation, it has become clear that a great deal of the content that libraries and scholars are creating today is expected to endure.

However, whose responsibility it is to look after this content is still unclear. In the United Kingdom, the current political and educational context offers urgent and specific reasons for institutions of higher education to support the outputs of its faculty: declines in government spending and national mandates for open access of scholarly outputs have encouraged this conversation. Meanwhile, the potential for use and re-use of this content has never been greater. While the hot issues around big data sets and peer-reviewed research articles often take centre stage, this study focuses on those digital content resources that require some form of support and management even after they are built. How are institutions supporting and maximising the value of the digital content their faculty and staff create?

This study, conducted by Ithaka S+R, with funding from the Jisc-led Strategic Content Alliance, grew from the findings of earlier studies showing that both funders and project leaders alike rely very heavily on their host institutions to support and sustain digital content, beyond the end of the grant. While the primary focus of this study is the lush, if unruly, terrain of higher education institutions, academia is not the only sector enjoying an era of digital growth. As museums and public-facing libraries seek to expand their reach beyond their physical spaces, digital activities have become a core part of their strategy. And so, as well as an assessment of the university environment as a "host" for digital content, this study includes a more exploratory look at how cultural heritage institutions think about and plan for sustaining and enhancing the value of their digital collections. The cultural sector offers very different models and allows us to draw initial conclusions around these useful models for others to replicate, experiment with and develop further.

This current study is the first phase of a three-part examination of this topic. Phase two, funded by the Canadian Heritage Information Network (CHIN), a Special Operating Agency of the Department of Canadian Heritage, will include a closer look at the cultural heritage sector and a detailed case study of the Museum of Anthropology at the University of British Columbia. Phase three, funded by the National Endowment for the Humanities (NEH), will examine the models in place specifically to support the digital humanities in institutions of higher education in the United States and include case studies of two American campuses. [Further information on these next phases can be found at www.sr.ithaka.org]

Methodology

Over the course of ten months, the Ithaka S+R research team interviewed 84 individuals in two phases of work. The first involved a landscape review, interviewing 40 practitioners in the higher education and cultural heritage sectors throughout the United Kingdom, including those who directly manage projects as well as those in administrative and other advisory roles.

In a second phase, in consultation with Jisc/SCA, we selected three institutions to examine closely in an effort to understand the digital content the institutions support, their processes for creating and supporting that content and, more generally, the role that digital content plays in the strategy of their institutions. We interviewed over 40 individuals from the following institutions:

UCL (University College London): A major research university with active Library and Museums & Collections units and a Centre for Digital Humanities. This complex campus with a highly regarded research reputation and burgeoning digital content landscape allowed us to examine the challenges of academic project leaders in a decentralised university setting.

Imperial War Museums: A major museum with five physical locations that recently underwent a significant reorganisation to centralise its digital management processes. This allowed us to explore the process by which an eminent and complex organisation centralised its digital strategy to create a sustainable infrastructure.

National Library of Wales: A national library with a collections focus on Welsh heritage and a clearly articulated mission to expand its impact through the use of digital media. This allowed us to explore the effort of a major cultural organisation to raise its national and international profile through its strategy of collection building and digitisation.

Summary of findings

Our examination of the higher education landscape revealed:

- **At UK higher education institutions, grant review processes do not often address issues of post-grant sustainability.** While guidelines have begun to emerge for data management plans, thinking about the ongoing life of projects that require development and growth is still in its early days. University administrators and those who review grant proposals rarely probe this topic at the review stage and most have only modest funds available to support ongoing activities, even for those projects that show real promise.

- **Many projects do draw some form of host support, but it is not budgeted or guaranteed.** Almost every project leader we spoke to could point to some benefit they derive from their host institution, whether in the form of server space or staff time. Yet few project leaders have firm plans in place for ongoing assistance or any assurance that this support will be ongoing.

- **There are potential partners on campus**, but project leaders tend not to seek them out early enough. Libraries and IT units are often available to guide project leaders, build or host content, but faculty do not always approach them at early stages, when critical decisions are being made.

- **Digital projects on campuses live everywhere! This extreme decentralisation adversely affects their discoverability.** They may be hosted by academic departments, the library, museums/collections, other support units, or elsewhere. While this is a mark of the admirable independence and creativity of scholars, it also poses challenges for discovery. There is often no single place for users to find digital projects and some projects can too easily slip from view.

- **Academic project leaders are vital to the success of their projects, but are often in a precarious position.** The few projects that benefit from deeper, ongoing support are strongly aligned with the core mission and identity of their host institutions and have very actively engaged project leaders. But project leaders report concerns about their own career advancement and rarely have succession plans in place.

- **Current funding styles do not support ongoing operation, but project leaders have not had great success generating other forms of financial support.** While funding bodies can issue requirements concerning access and deposit, other sources of funds have been hard to come by. Cost sharing is intended to build in institutional support, but this seems to work best when it is an integral part of the project's structure.

- **Campus-wide solutions are beginning to emerge, but even these tend to address just the basic "maintenance" issues of storage, preservation and access.** While institutional solutions have begun to crop up to provide digital outputs with places to live, they do not offer support for ongoing development, outreach, or audience development, even on campuses where "public engagement" is considered a core mission goal.

Our exploration of the cultural heritage landscape suggested that:

- **Many museums and libraries are centralising processes in order to encourage sustainability**. These activities range from coordinating the grant proposal process to developing shared digital asset management systems and central catalogues in order to serve a mission-based focus on building and engaging with audiences. Yet, despite the greater structural centralisation that we observed at museums and libraries, specific choices concerning what to digitise are still frequently opportunity-driven.

- **For many museum and library projects, the focus is often on the creation of new content, with ongoing sustainability often defined as making good up-front choices about standard formats and structured metadata rather than ongoing efforts to enhance the content or update user interfaces.** Determining how to keep the front-end fresh and responsive to user needs may be an area for further examination as cultural institutions seek to demonstrate increased audience impact.

- **Some large institutions that benefit greatly from centralised structures have begun to see an advantage in returning some of the digital work to the content creators.** They expect that designated project managers or other "champions" of significant resources can allow a more targeted, user-centric approach to ongoing development.

Recommendations

Based on the above findings, the study offers project leaders, funders and institutional administrators practical steps that could more accurately identify the needs of digital content projects from earlier stages and more effectively bring together the support that already exists. First, all would benefit from an early and honest appraisal of which projects are likely to require what type of support, post-launch:

- **Digital content, requiring just "maintenance"**: These may not require ongoing growth, but certainly do require a clear exit plan to ensure that the content will be smoothly deposited and integrated into some other site, database, or repository. The issue of ongoing investment does not disappear; it just becomes the concern of the larger platform on which this piece of content now lives.

- **Digital resources, requiring ongoing growth and investment**: These require early sustainability planning, including identifying institutional or other partners and careful consideration of the full range of costs and activities needed to keep the resource vibrant.

In addition, the following recommendations are intended to provide some food for thought for the different stakeholders involved in supporting digital content, whether on campus or in the cultural sector:

Funders:

- **Challenge impact statements.** No one can predict the future, but funders are in a unique position to press grantees to demonstrate deep knowledge of and interest in further understanding the end users of their work. This does not mean listing *more* potential audiences ("scholars in all disciplines will find topic x very valuable") but identifying specific audiences with an understanding of their size and the value they will find in the resource, a projection based on something more than guesswork and wishful thinking.

Academic project leaders:

- **Be realistic in assessing the future needs of the resource you are creating at its outset and your personal interest in continuing to support it.** If the project is something intended to grow over an indefinite amount of time, it will need ongoing support and a plan for obtaining that. If, on the other hand, the intention is to complete the project and move on, the project leader must have solid plans in place to ensure it is suitable to be deposited in a collection, repository, or other platform once it is done.

- **Identify campus partners early on.** Working with partners on campus to build appropriate costs into a grant is an important first step. Start as early as possible to secure host support. Build in costs of preservation and storage, but also seek goodwill and partnership with colleagues whose support you will need later on.

- **Consider how central your project is to the overall mission of your institution.** If you are engaged in a mission-critical project, your chances of gaining central support are much greater than if your project has little to do with the focus of the whole.

Institutional managers at universities and cultural institutions:

- **Consider to what extent current activities could be drawn together to create a deeper network of support**, both for "maintenance" projects and those with the potential to really grow.

- **Consider developing unified, coherent ways to help users find content once it is created and supporting efforts to reach out to users of the content.** These do not necessarily have to be complex undertakings; a good first step is to have an inventory of what and where all of the digital content holdings are. Common catalogues serve this function up to a point, but may require additional signposting in order for users to know just what holdings are contained within.

- **Determine where scale solutions really pay off** and where subject and resource experts are the best placed to advance and champion a project. For example, "back-end" functions, including storage and preservation, can be done in a way that creates common systems for an organisation, while still offering the potential of using the digital assets in different ways.

- **Continue to identify and support the ongoing development of the "front-end"**, including ongoing research into user needs, interface development, and content enhancement. For those projects that are intended to grow, scale solutions will only go so far. Content experts will still need to pay attention to the changing needs of users and determine what enhancements the digital resource will require.

We hope that this study provides a more transparent way for project leaders, funders and institutional leaders to assess the potential impact and needs of the content they create, and to develop effective ways to provide institutional solutions. As new uses for digital content continue to emerge, so will the tactics for supporting them. Whether these solutions take the form of centralised technical solutions such as storage and preservation, gathering and sharing guidance on funding models, or creating more powerful tactics to share the content with a wider audience within and beyond the institution, even starting these conversations and asking the questions may prove a valuable first step in bringing the richness of this digital content to the fore.

1. Introduction

In 2012, the digital future forecast for years now seems fully upon us. Although the most visible signs of our embrace of digital media may belong to the world of commercial entertainment and the iPads, e-readers and smartphones we use to consume it, the shift now taking place in scholarly communications is proving to be no less transformative. It is taken for granted that all scholarly articles and books written today will eventually be available in some digital form. While computational methods have long been used in science for data gathering and analysis, the findings and underlying data are slowly but surely making their way into public online repositories, available for others to view, assess and re-use. Even in more conservative corners of the academy humanities departments, for example, digital methods are spurring the creation of digital resources that are fully intended to be shared widely.

At the same time, institutions across the UK have seen increased pressure to keep costs low while generating evidence of impact, usage and demand, triggering public debate concerning the openness of scholarly articles and the preservation of large data sets. Funders, including Jisc, the Wellcome Trust, Research Councils UK (RCUK) and others, have continued to support the creation of new digital content, and as expertise has developed throughout the sector, expectations have risen around the value of that content for scholars and for the broader public. In July 2012, RCUK announced a new open access policy, requiring that research outputs created with public funds be made openly available. In 2014, the Research Excellence Framework (REF) will for the first time include "digital artefacts" as part of its process of assessment of research excellence and broader impact of research outputs — all of which determines a slice of institutional research funding.[1]

The sort of dynamic scholarly digital resources we are concerned with here — those content collections, born-digital websites, community-contributed transcriptions and other public-facing, content-rich collections — deserve to be part of the conversation as well. With the potential to reach thousands, to broadcast the achievements of faculty, to deliver on the promise of engagement with people beyond the walls of the academy, and even to drive new revenue streams, these digital resources offer a unique set of opportunities. Will institutions see maintaining and enhancing their digital content as a costly activity they cannot afford to support or as an investment they cannot afford not to?

While it is clear that there is work to be done to keep these resources current and valuable, **less clear is whose job this should be and how it should be supported**. Scholars who have been awarded grants to create resources may or may not choose to continue developing them, and funders increasingly make clear their interest in supporting new projects rather than carrying older ones. In whose interest is it to support current and future generations of projects? What happens, or should happen, as their creators move on?

The issue varies greatly depending on where these projects live. **Universities and colleges** have not traditionally taken on content development or distribution as a strategic priority. The notion that the university itself could or should have a central policy for dealing with this appears to be in its very early days and is largely focused on deposit policy for research and data outputs. Previous studies have highlighted campus administrators' "significant detachment [...] about publishing's connection to their core mission"[2] and this still appears largely to be the case.

1   Research Excellence Framework 2014, Assessment framework and guidance on submissions (London: REF, July 2011), p23, **www.ref.ac.uk/media/ref/content/pub/assessmentframeworkandguidanceonsubmissions/02_11.pdf**.
2   This 2007 US study focused primarily on traditional publishing outputs but suggests that digital content strategy is not a priority among many university leaders. Laura Brown et al, University Publishing in a Digital Age (NY: Ithaka S+R, July 2007), **www.sr.ithaka.org/research-publications/university-publishing-digital-age**.

Today on university campuses, digital content blooms in every meadow: in the library, in museums and collections and throughout academic departments, where individuals or teams of faculty members may receive funding to build something completely new, digitise an existing collection, or create a hybrid project. Some campus units, such as libraries and museums, have their own policies, but academics are frequently left to sort things out on their own. They may seek out university library or museum staff for guidance, or partner with experts at their digital humanities centre, if their institution is fortunate enough to have one. They may be ensconced in a technology-rich department that boasts its own programming staff, servers, and tech support, or they may have to enlist outside vendors. Their projects may be one of several in a working group or lab, or the only one in a given department. The academics running these projects may be skillful and interested in audience building, or content to enjoy a small, unexplored audience for fairly specialised work. In a best-case scenario, an entrepreneurial project leader will have rich resources to draw from and will be able to forge strong partnerships with various colleagues on campus to help support and develop the project and build its audience. However, the more common scenario is that project leaders are somewhat isolated from potential support structures on campus.

Museums, libraries, and archives provide a very different institutional context. Many have begun to place parts of their collections online, offering new ways for the public to engage with their holdings. As in higher education, reduced public funding to the cultural sector has made it all the more important for museums and libraries to demonstrate impact and identify new sources of support. However, unlike higher education institutions, museums, libraries and archives have long considered conservation and preservation to be a key part of their mission and so are likely to have clear and vested interests in the long-term support of the digital content they create, as they would for their physical holdings. For many such institutions, creation of digital content is a natural extension of their mission, rather than a special project. How these activities are defined and carried out varies from place to place, but the desire to make digital preservation an institutional priority is a tenet most (if not all) share.

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By looking at both the academic and the cultural sphere, we hope to glean lessons from each sector. Within the academic sphere, we chose to concentrate primarily on the humanities and social sciences, for reasons both practical and conceptual. The humanities and social science resources we focused on are of interest in a number of ways: they are often ignored in discussions of big data and research repositories; keeping them valuable requires more than simple deposit; and the content has potential for broader accessibility to an audience far beyond research scholars. In examining how libraries and museums understand their role as "hosts" of content, we considered whether these more centralised organisations might offer useful models to emulate, and also how much of the sustainability problem was "solved" by institutions that have a central catalogue and a coordinated approach to content creation and preservation. Even if museums and libraries had succeeded in those areas, did they face other concerns when considering how to make their content vital for the long-term?

We believe this study will be useful for **project leaders**, who have often invested a great deal of time, effort, and passion into creating valuable databases, websites, communities, tools, and content. In many cases, they struggle to identify ongoing funding and reliable sources of support. We hope that this study will provide a clearer sense of the steps they might take when planning their projects or seeking ongoing support for ones they have already created, specifically when they hope to embed these projects in the fabric of their host institution.

Funders may find this report valuable when considering how to structure funding calls, and how to evaluate applicants' proposals. To the extent that it is possible to flag future issues at the earliest stages of a grant, we hope that this will suggest the sort of questions concerning goals and intentions that project leaders and funders need to consider.

And finally, we hope this study will prove valuable for **leaders of the institutions** themselves. With digital projects cropping up in academic departments, libraries, museums, and elsewhere, to what extent are institutional leaders beginning to see themselves as "publishers" of digital content, not just providing ad hoc storage space but actively embracing and supporting this unique asset they and their staff have created? We hope to help leaders of institutions consider the value that a deeper and more committed engagement might hold for them and to offer some pragmatic guidance for assessing the needs and potential benefits of supporting the creation and ongoing impact of the digital content they create.

2. Background

The current study developed as the result of increasing evidence of the vital role that institutions were playing to support digital resources, including those initially created through outside grants.

In 2008-9, a Strategic Content Alliance-funded Ithaka S+R study examined the sustainability strategies of a dozen digital projects and organisations to see how project leaders were using a combination of revenue generation, donated time, and other in-kind contributions, in addition to a steady stream of new grants, to support their work.[3] In most cases, project leaders' host institutions were helping in many ways, from donating staff time to offering direct support when required.

In 2011, our researchers went back to see how our case study subjects were faring. We discovered that, during what had been two difficult years for the economy in general and higher education in particular, project leaders — even those who had started to develop revenue-generating support — had been obliged to rely on support from their host institution to an even greater extent. This was often as the result of not reaching hoped-for financial targets on their own.[4]

In our 2011 study of funder practices and attitudes, we heard that when funders made decisions about where to place grants, they also factored in the ability of the hosting institution to support the digital outputs for the long term. "We are more comfortable making grants to well-endowed universities because we know they will support these projects", said one funder at the time. "It was more about getting a commitment from an institution than about a type of business", said another programme officer when explaining a complex project that his organisation had funded.[5] While some commitments were contractual — an agreement to make content available for x years, for example, might figure in the terms and conditions of the grant — it sounded like there might be plenty of assumptions operating.
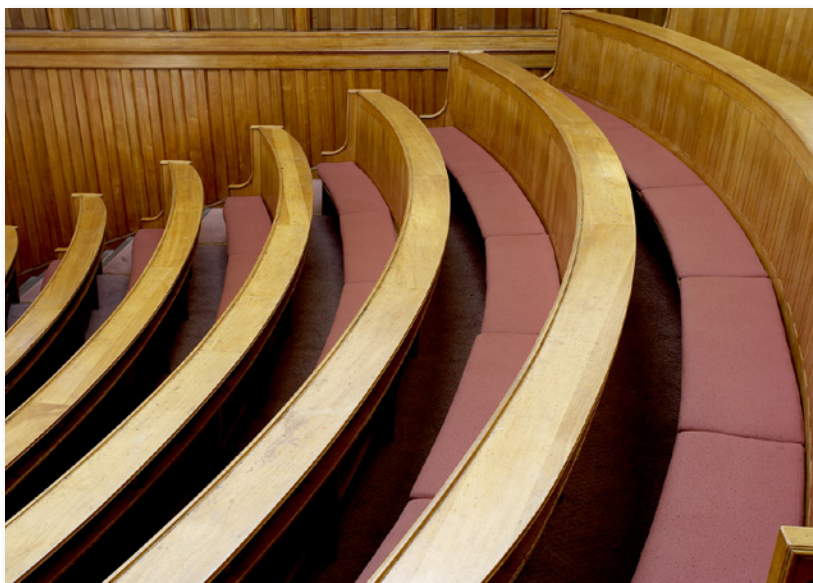
Gustave Tuck Lecture Theatre,
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3   Kevin Guthrie et al, *Sustainability and Revenue Models for Online Academic Resources* (NY: Ithaka S+R, May 2008)
     www.sr.ithaka.org/research-publications/sustainability-and-revenue-models-online-academic-resources.
4   Nancy L Maron and Matthew Loy, *Revenue, Recession, Reliance: Revisiting the Ithaka S+R Case Studies in Sustainability* (NY: Ithaka S+R, Oct 2011)
     www.sr.ithaka.org/research-publications/revenue-recession-reliance-revisiting-scaithaka-sr-case-studies-sustainability. The original set of case
     studies are included in Nancy L Maron, et al, *Sustaining Digital Resources: An On the Ground View of Projects Today* (London: Jisc, April 2009)
     www.jisc.ac.uk/publications/programmerelated/2009/scaithakaprojectstoday.
5   Nancy L Maron and Matthew Loy, *Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources* (NY: Ithaka S+R, June 2011), 35
     http://sca.jiscinvolve.org/wp/portfolio-items/funding-for-sustainability-how-funders-practices-influence-the-future-of-digital-resources/.

Having observed the depth to which project leaders were relying on their institutions, and the often implicit reliance funders placed on the host institutions, the time seemed to have come to examine what decision-makers at those institutions thought about all this. In October 2011, the Jisc-led Strategic Content Alliance issued an invitation to tender for a study on Digital Content and Host Institutions Support Strategies. It required an examination of the practices of project leaders in expressing the value of their work to their institutions, as well as the practices and attitudes of host institution decision-makers who review, approve, and otherwise support the digital projects post-grant. The invitation to tender called for an in-depth exploration of three institutional cases, including both academic and cultural institutions.

2.1 The sustainability problem and the special case for digital content

For well over a decade, significant investment in creating digital resources has been spurred by government agencies and funders, as well as by private philanthropists.[6] Even today, developing sustainability plans remains a challenge for many of these projects. While most will agree that, at the very least, early efforts to create digital content were valuable for increasing the capability and experience of those who engaged in them, some of these earlier projects have been criticised for not being "future-proofed" and indeed, not all are easily available today; a few may be entirely inaccessible and even those that do exist have lost value as their content and interfaces remain frozen in time or worse. A review of UK Digitisation Projects, funded by the New Opportunities Fund (NOF) Programme from 1999-2004, evaluated 154 grants and found that as of August 2009, 25 or 16% were found to have "no known URL or URL not available" and for 82 or 53%, it was noted that while the website exists, it "seems not to have changed since the launch".[7] The LAIRAH Project: Log Analysis of Digital Resources in the Arts and Humanities, a study that sought, among other things, to "determine the scale of use and neglect of digital resources in the humanities" reviewed usage logs of the 1255 projects in the Arts and Humanities Data Service, finding that "most of the projects that we studied are finished, [but] very few are being actively updated".[8]

Other sorts of projects – particularly those that take the form of tools, software, or platforms – have faced different types of sustainability challenges. Some of the deepest investments have been in the system infrastructure itself, such as the janet network and the establishment of institutional repositories for universities and disciplinary fields, as well as in the innovative creation of tools and software to create, analyse, deposit, or otherwise transmit data. These tools and systems, by their nature, are intended to develop over time; funding for innovation and research is understood to include supporting many projects whose value lies as much in what is learned through the process of creating them as it does in preserving them for posterity. In creating software, for example, it is understood that, as a matter of course, first generation experiments will be tested and either discarded or improved upon to make way for newer, more effective versions. These experiments, by definition, do not come with expectations of sustaining any specific outputs – and so, for the purposes of this study, we are focused less on these types of resources.

But content collections are a special case; while some funding calls still stress innovation over sustainability, there continue to be significant investments into creating content that is fully expected to endure. Today, a digital content project may create digital copies of rare materials, "born digital" original scholarly commentary, or websites that include the presence of an active network of scholars. A modest digital resource may have a modest following, but the more popular

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6   The major UK funding programmes in recent years include Jisc's Digitisation and Content Programme, which has dedicated over £30 million to more than100 different projects since 2003, and funding from various branches of RCUK. The Heritage Lottery Fund has recently launched new support streams to encourage digital works. In the United States, the National Endowment for the Humanities continues to support programmes in the digital humanities; the ADR track of the Institute for Museum and Library Services' National Leadership Grant programme "support[s] the creation, use, presentation, and preservation of significant digital resources". Private funders, including the Leverhulme Trust, the Wellcome Trust, the Alfred P Sloan Foundation, and the Andrew W Mellon Foundation have long played significant roles in supporting digital resources, as well.

7   The original report, developed by Alastair Dunning, is no longer available as such, but the underlying dataset is here: **http://hdl.handle.net/10760/17518**.

8   See **www.ucl.ac.uk/infostudies/research/circah/lairah**.

sites can garner audiences of users and contributors that reach far beyond the footprints of their host institutions. Nor does a "modest following" necessarily imply the digital resource is not worth preserving.

2.2 Sustainability defined: Usage and impact, not just preservation

These projects tend to require much more than a safe place to sit. Some may require regular technology upgrades to interfaces and tools; others may need content updates, done by paid or volunteer editors; and most could certainly benefit from ongoing market intelligence and outreach in order to remain responsive to audiences they serve. All of these activities require time and often money if they are to remain valuable to their users. Without ongoing attention, digital resources may become stale, underused and, eventually, difficult to find.

While each project leader will know best what digital standards they require, how often they will need to refresh content, and to what extent they will need to encourage the range of people who support their work, all of these activities will take time, and some will require money, as well. Digital project leaders need to consider the full range of financial and non-financial resources they will need, not just to build a website but to support the ongoing activities that will make it possible for their digital resource to have the impact they want it to have. Thus, we define sustainability as:

The ability to identify the resources needed to keep a digital resource or service delivering value to the users it is intended to serve.[9]

The critical part of the definition above lies in the notion of delivering value to users. While some project leaders and funders may be satisfied with content that is "findable" if one knows the exact URL of its website, we would like to suggest that our definition has more to do with sustaining the value and impact of the content than with the permanence of its content, which is necessary but not sufficient.[10] Consider these hypothetical scenarios:

- A suite of original scholarly content about key people and places. The content was "completed" over five years ago, and has been hosted as per funder request, but the interface has been only minimally updated since and certain features no longer work in modern browsers

- A thematic aggregation of primary source documents concerning political elections that has shown some user uptake, but has not benefitted from any updated content for over ten years

- A project that has developed an active contributor community but can no longer support any ongoing moderation or active support of the community.

- A collection of peer-reviewed teaching resources and lesson plans that is not actively investing in understanding the needs of teachers

These examples illustrate projects whose content may well be safe and sound on servers somewhere, but whose impact is almost certain to decline without further ongoing support for the project. Without this attention, these projects may remain findable (if one knows the precise URL!), but they are either virtually invisible through a simple Google search or, more importantly, difficult to use, incompatible with current technology and delivery devices, simply discounted by users who encounter outdated sites and choose to go elsewhere, or lose the interest of their target audience when they fail to stay current with what that audience needs. By our definition, such projects have already failed the test of sustainability.

9   Nancy L Maron et al., *Sustaining Digital Resources: An On-the-Ground View of Projects Today* (London: Jisc, April 2009)
     www.jisc.ac.uk/publications/programmerelated/2009/scaithakaprojectstoday.
10 Nancy L Maron, *Framework for Post-Grant Sustainability Planning for Digital Resources* (NY: Ithaka S+R, 2011)
     http://sca.jiscinvolve.org/wp/files/2011/10/iDF158-SCA_Ithaka_Framework_Sep11_v1-final1.pdf.

Funders, including Jisc, Wellcome and others, have begun to implement policies to support the ongoing accessibility and viability of the content they help to create.[11] A great deal of guidance is also now available to support project leaders who must assess and manage risk when deciding how to create and share their digital content,[12] learn the processes involved in planning for a digital project and even think through data management plans (now a requirement of many granting bodies).[13] A recent report highlights the myriad ways to capture and express the value of these digital resources and strategies to measure the impact of their work.[14] The element that remains to be examined is, what structures and support are in place to encourage digital project leaders to create resources that are impactful, and ultimately sustainable, in the first place?

Imperial War Museums (London) ©① Simone Graziano Panetto, Attribution 2.0 Generic

The National Library of Wales, Aberystwyth ©①② John Lord, Attribution-ShareAlike 2.0 Generic

UCL Quad, University College London ©UCL

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11 Nancy L Maron and Matthew Loy, *Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources* (NY: Ithaka S+R, June 2011), **www.sr.ithaka.org/research-publications/funding-sustainability-how-funders'-practices-influence-future-digital**.

12 Naomi Korn and Charles Oppenheim, *Web2Rights IPR Toolkit* (London: SCA, March 2009), **www.jisc.ac.uk/media/documents/publications/scaiprtoolkitoverview.pdf**.

13 See the *Data Management Plan (DMP) Tool*, available at **https://dmp.cdlib.org/**.

14 Simon Tanner, *Measuring the Impact of Digital Resources: The Balanced Value Impact Model, King's College London* (London: KCL, 2012), **http://www.kdcs.kcl.ac.uk/innovation/impact.html**; Oxford Internet Institute, *Toolkit for the Impact of Digitised Scholarly Resources* (TIDSR) available at **http://microsites.oii.ox.ac.uk/tidsr/**.

3. Methodology Overview

To understand the ecosystem of support and the expectations that surround it, we chose to look both wide and deep. A *landscape review* offered the opportunity to interview people in each of three roles at institutions throughout the UK:

- The funders who make grants and may harbour some expectations of ongoing host support.

- Digital project leaders, who must decide what steps to take once their initial grants come to an end.

- Representatives of the host institutions themselves — those in a position to decide whether or not, and to what extent, they might take on some responsibility for the ongoing care of the digital resources created by members of their communities.

With a goal of understanding institutional dynamics at play, we also chose to do three institutional case studies, or *deep dives*, of different institutions. This allowed us to develop a sense of the different strategies that might be emerging, and different challenges that might still exist, for institutional leaders seeking to develop system-wide plans for supporting digital content projects. UCL (University College London), the Imperial War Museums, and the National Library of Wales offered us the opportunity to explore these questions at three very different institutions. The section below provides a general discussion of the concepts and tactics used in the study; further detail concerning methodology and its implementation can be found in Appendix A.

3.1 Landscape review

To understand the perspectives of project leaders and of institutional managers, we undertook interviews with stakeholders in those roles at a variety of institutions, speaking with them about the environment for digital content projects in the UK and their own experiences and perspectives on creating or supporting digital content. We selected interviewees from a range of settings, including major research universities, smaller higher education institutions and cultural heritage organisations throughout the United Kingdom. The summary table of interviewees below provides a snapshot of the segmentation. This table excludes those we interviewed from the three "deep dive" sites, though clearly their stories also helped to inform our understanding of the landscape. In total, we spoke to 40 people from 30 different institutions. In some cases people spoke to us from their multiple perspectives (a project leader who also plays an administrative role, for example), but in the following table each individual is counted only once.

Role	Institution type	Count	Total count
Project leaders	Russell Group	6	12
	Non-Russell Group	6	
Administrators (including library directors and staff)	Russell Group	11	13
	Non-Russell Group	2	
Funders		3	3 plus 26 interviews from 2011[16]
Cultural organisations		7	5
Other experts		5	5
			40 total interviews

Table 1: Landscape interviewee segmentation

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15 Nancy L Maron and Matthew Loy, *Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources* (NY: Ithaka S+R, June 2011), **www.sr.ithaka.org/research-publications/funding-sustainability-how-funders'-practices-influence-future-digital**.

Identifying project leaders and funders was fairly straightforward and interviewees often suggested others for us to contact. Identifying administrators or senior managers — those who could represent the perspective of the institution or who otherwise play a decision-making role in supporting content — was more complex. There are many different roles and positions involved in approving, monitoring or otherwise supporting digital content. These include various stakeholders in the library, museums, and academic departments; department heads, vice-deans and deans of research; research facilitators and others who review grant proposals; IT staff, directors of digital humanities centres who lend advisory support; and digital resources managers at libraries. This search for interviewees itself proved quite useful in offering a window into the grant review and project development process, the mandatory terms that govern project approval and the sorts of guidance provided by the home institution.

While librarians were not initially identified as a distinct interviewee category, we quickly discovered that many digital projects looked to their home institution's library for hosting and advisory support. In order to explore this relationship further, we interviewed a number of librarians who were involved with digital initiatives at their institutions. In these interviews we discussed the kinds of support that libraries have provided to projects as well as their strategies for sustainability and procedures for deciding whether to take on projects.

3.2 Deep dives

While scanning the horizon allowed us to gain a sense of activity throughout the sector, the project team, in consultation with Jisc, selected three deep dive sites in order to understand, at a detailed level, the landscape of digital projects at the institution, their procedures and support structure, and potential strengths or weaknesses of their strategies. These institutions represented three different institutional settings — university, library, museum — each with a different approach to supporting digital resources:

- **UCL (University College London)**: A major research university with a Centre for Digital Humanities and library, as well as museums and collections. This allowed us to examine the challenges of a decentralised university setting

- **Imperial War Museums:** A major museum with five physical locations that had recently undergone a significant reorganisation to centralise its digital management processes. This allowed us to explore the way in which a major and complex organisation centralised its digital strategy to create a sustainable infrastructure

- **The National Library of Wales:** A national library with a collections focus on Welsh heritage and a clearly articulated mission to expand its impact through the use of digital media. This allowed us to observe an institution with a clear digital strategy and a grand challenge: to raise its national and international profile through collection building and digitisation

Deep Dive Institution	Count
UCL	27
The National Library of Wales	11
Imperial War Museums	6
	44 total interviews

Table 2: Deep dive interviewees

Due to the distinct nature of each institution, we chose to tailor the methodology to best suit the conditions we observed at each. At UCL, we implemented a campus-wide assessment of humanities and social sciences digital resources, including administering a survey to project leaders.[16] At the National Library of Wales (NLW) and the Imperial War Museums (IWM), both centrally managed

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16 The UCL project leader questionnaire is in Appendix D.

organisations, identifying collections was not a challenge, but assessing the current status or needs of projects was. This led us to develop a **"health check tool"** [see more on **page 77**] with Lorna Hughes and the staff at NLW as a means to assess ongoing support for and impact of their digital collections. In each case, however, the goal was the same: to understand the landscape of digital content creation at the institution, the support structures in place for digital creations, and the rules, both tacit and explicit, that govern the support their institutions provide.

At each institution we identified someone to serve as a main point of contact throughout the project. Ithaka S+R researchers conducted site visits to meet with project leaders, administrators and other individuals playing important roles in the ongoing support of digital content. These contacts were critical to our ability to conduct this research and played a key role in helping us navigate the often complex organisational structures involved.

Health Check Tool for Digital Projects

See page 77 >

4. Strategies For Host Support

For some projects, sustainability may mean simply finding a safe and reliable place for deposit. For example, when a scholarly research article is written, its author may deposit it to live on as part of a larger aggregation of articles in a journal, a repository, or both. For all intents and purposes, the author's responsibility for sustaining the content is done. But sustainability, and sustaining the impact of the article, does not end there. The manager of the repository, or the publisher of the journal, now has the implicit responsibility to make sure that content reaches an audience, that it lives on a platform people can find and enjoy using, and that the technical integrity of the content will be preserved. In other words, while the activities needed to sustain the content may not always be the responsibility of the initial creator of the work, the need for those activities does not go away. In this case, that responsibility just transfers to the the host — here, the publisher.

Some digitisation projects fit a similar mold. A scholar or librarian may choose to digitise a clearly defined, circumscribed body of content and once the collection is fully digitised, no ongoing content development is thought to be needed. The Montefiore Testimonials Digitisation Project at UCL, for example, consists of digitising manuscripts from Sir Moses Montefiore, a prominent 19th century British Jewish philanthropist. Because there are a finite number of manuscripts, the project will at some point come to an end. In this case, the project leader plans to deposit the completed materials with the library. While costs for server space or website updates would remain, these would be covered by the library and there would be no need to add more content, keeping the library's ongoing costs low. From the vantage point of the project leader, this seems like a natural end-point for the project, or at least his engagement in it. It's not that the content or its interface will not require ongoing support, just that the original creator of the content will effectively transfer that role elsewhere.

Museums and library collections often operate in the same way. Directors may consider a digitised collection to be "finished" and sustained once it has been scanned, catalogued and deposited into the digital asset management system so that it can be searched and found through the common catalogue. But, we might argue, the true question of how that content will be used, by whom and how, has only been transferred to those whose job is to manage the impact of the catalogue (ie the institution's full collection) itself.

> **Are any projects really "no maintenance"?**
> For those who want to be sure their projects will require little ongoing investment, there are worthwhile steps to consider in the earliest stages. With Histpop: The Online Historical Population Reports Site, project leader Matthew Woollard of the University of Essex took precautions in the planning stages to be sure that when it was completed it would have few, if any, ongoing costs. He made certain that the full corpus of content — historical documents and British population reports for Britain and Ireland from 1801 to 1937 — was digitised and ingested during the grant period and he invested in quality assurance work at the image level to avoid having to make fixes later. This upfront investment now allows him to "cover ongoing costs and devote just a small amount of time each week to respond to user queries", though even he admits that "in five years' time, [the interface] will look dated". In other words, even those "no maintenance" projects will actually require at the very least some ongoing work, but they still stand in stark contrast to projects requiring significant development.

Not all projects come to neat conclusions at the end of grants. Those projects that do not have a plan to be deposited into some larger, actively managed collection will need ongoing attention. Some of the most ambitious projects create new and innovative models that will require ongoing activities such as data selection and curation, technical development, outreach and marketing and

other activities that contribute to the ongoing value of the resource.[17] As Rob Iliffe, the director for the AHRC Newton Papers Project at the University of Sussex noted, for online resources like his that include continued content development and tool enhancement, "the work is never going to end".

Indeed, even for those projects with clear milestones, like the Newton Papers, where a complete content collection may be created, "there are what we might call 21st century scholarly obligations. Readers of the future will want, expect and demand updated interfaces incorporating new analytic tools such as Latent Semantic Analysis and various annotation tools; the ability to comment on aspects of the site via social media and also to generate core content via crowdsourcing; the provision of introductions, commentaries (filmed/podcasted/written) and other enhancements (such as side-by-side presentation of transcriptions and images of originals); integration into other datasets (EEBO/ECCO/Internet Archive), and indeed the structured provision of (all of) Newton's own sources…". And Melissa Terras, who has experience working with many projects as co-director of the UCL Centre for Digital Humanities, told us, "If 'maintain' means keeping it parked on a server, that's fine — but if it means updating and such, you can't keep up".

The Digital Exposure of English Place-names project,[18] "DEEP", hosted at King's College London, provides a different example of a project for which ongoing updates are an inherent part of the resource's value. DEEP maps historic place-names to their contemporary counterparts and its value is based on its ability to stay current and accurate. As the project leader, Stuart Dunn, explained, "The survey is an ongoing exercise; [our] digitisation work would become outdated in a few years if there were no ongoing effort to keep it current". Even projects that could be considered "finished collections" or outputs benefit from ongoing work. As another project leader remarked, "If things stand still, people lose interest".

Projects of both types often live side by side at universities, libraries and museums. Strategies that are perfectly sufficient for content destined to be deposited into large, existing data collection sites and served up through a common catalogue may fall quite short when planning for projects that require custom development, user management, and ongoing outreach to remain vital.

Universities and cultural institutions approach their role in caring for this content in very different ways, as outlined in the two main sections that follow. Highly decentralised higher education institutions benefit from the independence and creativity of their scholars but rarely invest in coordinated approaches to supporting or promoting the digital resources they create. Cultural institutions, on the other hand, are often digitising parts of their own collection and have a much more immediate connection to and responsibility for the digital outputs they create. That said, their interpretation of "sustaining content" may not extend far enough. Throughout these sections, we draw upon evidence from the landscape interviews and the deep dives and begin to point out the elements that appear to be working best, as well as opportunities for funders, project directors and institutional leaders to further support projects in ways that benefit the audiences of readers, users and others who engage with digital content.

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17 Ithaka S+R's *Framework for Post-Grant Sustainability Planning for Digital Resources* suggests some categories for ongoing support: **http://sca.jiscinvolve.org/wp/files/2011/10/iDF158-SCA_Ithaka_Framework_Sep11_v1-final1.pdf**. See also Christa Williford and Charles Henry, *One Culture: Digital Collections, Computationally Intensive Research in the Humanities and Social Sciences: A report on the First Experiences of First Respondent to the Digging into Data Challenge* (Washington DC: CLIR, July 2012). **www.clir.org/pubs/reports/pub151**.

18 Online at **www.kcl.ac.uk/innovation/groups/cerch/research/projects/current/deep.aspx**.

5.   The University As Host

The research university is a complex organism and identifying the loci of digital activity, the processes underlying this activity and the structures in place to support these projects is not a simple task. At research universities, the players actively involved in digital content development, enhancement, hosting, and preservation may include the university library, the university museum, the central IT division, a digital humanities centre (if one exists) and most, if not all, academic departments. The beauty of this extreme decentralisation is that "digital" activity no longer takes place off to the side but instead has come to permeate all corners of the organisation. However, the very independence that allows creativity to flourish may not provide enough structure to prop up and support the ongoing development of digital projects.

The sections below highlight the current practices and attitudes concerning institutional support of digital content at universities, as well as some of the unintended consequences of these practices, from the earliest stages of proposal development to sharing and promoting the fruits of those labours.

5.1 University grant review processes do not address post-grant sustainability

Each university has its own method for developing, screening and ultimately approving faculty grant proposals and these processes vary a great deal from institution to institution, from department to department and even from grant to grant, depending on the type and significance of the funding bid. That said, certain major criteria are fairly consistent: university administrators screen proposals for research excellence and financial accuracy at the very minimum. Projects that fall below a certain cost threshold may require a brief review, while major research projects will often be put through more rigorous screenings. At the University of Oxford, for example, humanities research facilitators are "deeply involved with the individual academic to discuss their ideas, the implications of their ideas, and the cost". Projects that are unusually ambitious or request large amounts of funding are reviewed especially carefully and it is not uncommon to have a many-tiered process, with a department review followed by a screening at the faculty (school) level and concluding with a final assessment by the office of the vice-provost (research) for research and financial soundness. It is not just the most prestigious universities that take this process seriously; smaller institutions reported careful review as well, as each individual bid makes up a more significant proportion of the institution's entire research output.

But in conversations with those who screen proposals, whether heads of departments, research facilitators, or deans of research, a common refrain emerged. While academic excellence, legal issues and grant budget are carefully scrutinised and may cause the panel to request revisions if concerns arise, little emphasis is placed on determining how sound the plan for supporting the grant's digital outputs will be; planning for the period after the grant is rare. Discussions may be sparked by funder mandates but are often limited to issues of basic preservation and storage. While concern for ongoing "access" has become fashionable, this still tends to be a passive sort of access rather than active outreach, promotion, development, or enhancement of the resource. As Martin Lewis, university librarian at the University of Sheffield, noted, library management "generally hasn't considered sustainability when seeking external funds for digitisation projects, unless the funder specifically requires it". Below is a sampling of how others in decision-making roles described the efforts made to assess post-grant sustainability:

- We will "cross the sustainability bridge when we get to it" — university library administrator.

- "The last thing when you're approving a project is what happens at the end of the project" — university administrator responsible for reviewing research bids.

- "In my experience, bid writing is right up to the wire and the focus is on getting the bid, not on what will happen after" — library information manager.

- "The big worry is that [project leaders] have agreed to make these materials available for perpetuity without having a good sense of what the costs associated with that are" — digital library director.

- "We theoretically are aware [sustainability] is an issue, but so far we have not thought about it in detail or made any plans" — academic head of department.

- "Sustainability is not a priority; the assumption is that if you can build a resource during the timeframe, then keeping it going requires zero. But that is not true" — research manager.

And yet, it seems that the reason for this non-discussion may not be lack of interest but rather the real challenge of forecasting costs for digital projects that may not have yet been built. This situation becomes even more challenging when university administrative departments such as finance are expected to estimate ongoing, long-term support costs, especially if they do not have experience with digital resource development. As an associate dean for research explained, "Finance will cost proposals if they're asked to and will fill in gaps where they think costs are missing. But they're mostly familiar with things like conference travel costs, time required for research. They're less familiar with things like digital resource costs after the end of a project". And even when the "sustainability plan review is there in principle [...] in practice, it doesn't work out as well". Andrew Fairweather-Tall, assistant registrar (research) at the Humanities Division, University of Oxford, who has been described by a colleague as the administrator responsible for spotting the "digital time bombs" hidden in grant proposals, explained that there is no substitute for experience: "We have seen many different models of projects in the facilitators' team over the years. We know some of the things that have been successful in the past and some of the pratfalls that happen after [...] [So now] we are getting better at understanding what these things will cost and who is best placed to provide appropriate support".

This first review "gate" then, at the time a funding proposal is initially developed, could be an important first screen to make sure issues related to the future of the resource are considered, whether or not firm answers exist yet. Storage space and data preservation must be considered, for sure, but long-term development plans, user engagement, and the potential for other partnerships within and beyond the university would also be a valuable set of discussions to have, even in those early days. But without the processes in place to force these conversations, and without qualified people in review roles who are trained and experienced in flagging issues before they develop, it will continue to be difficult to use this first review "gate" as a means to build stronger strategies for support.

5.2 A wide variety of host support, but rarely budgeted or guaranteed

Once a project is approved and underway, its costs are typically funded under the terms of the grant. Once that initial phase is complete, most projects continue to draw some degree of support from the host, be it in the form of office space, support staff, materials, building work, and/or basic technical services such as internet access and general IT support. The list below provides an indication of the range of types of support we have observed, though most project leaders we spoke to receive just a few of these. The support they do receive is rarely budgeted or assured — nor often even quantified in financial terms — but is usually provided on an ad hoc basis:

Among the types of in-kind support reported to us and observed elsewhere were the following:

- **Information technology or support services.** University IT units, library and museum units, university repositories and data services often provide technical support and hosting for digital projects and this was by far the most common form of support for digital projects. Technical support often includes server space, but in some cases it also includes assistance to prepare data for project platforms by converting materials or by creating metadata.

- **Advisory services.** Academics we spoke to were not always experienced in the creation and strategic development of digital projects. In some cases host institutions provide expertise in project development. Units cited as offering advisory support at UCL included the business unit, UCL Business PLC; the library; research services; and the IT department.

- **Marketing and outreach.** Project leaders occasionally rely on their hosts for greater exposure for their products, either through staff time from the marketing and outreach teams at their institutions or through being able to use space on existing platforms to feature projects. For instance, Chris Lintott, co-founder of GalaxyZoo, credits the Oxford publicity department with getting the word out in its early days, leading to high usage immediately at launch.

- **Legal guidance.** Rights clearance, in particular, can be very costly for digital projects. In the case of the French national audiovisual archive, Institut national de l'audiovisuel (INA), their commercial licensing unit, Ina MEDIAPRO, was not "charged" with rights clearance costs, which were borne as a core cost of the organisation.[19]

- **Financial and accounting services.** Financial units at universities play a role in digital projects from an early stage, often evaluating grant proposals before submission and occasionally providing financial advice afterwards. Particularly large endeavours, such as Transcribe Bentham, a crowdsourcing transcription project at UCL, are sometimes able to obtain staff time from the host institution to help with departmental budget management. In the US, the Stanford Encyclopedia of Philosophy was able to rely on its home institution, Stanford University, to manage the investment of the endowment it was building.[20]

- **Preservation.** Depending on how broadly preservation is defined, many project leaders rely on the host institution for activities ranging from developing metadata to fit resources into existing catalogues or repositories to financing technical preservation solutions. Most project leaders turned to host institutions for preservation support, though some reported going outside the institution to back up files, fearing they could not trust institutional solutions.

- **Content selection.** In some cases, the host institution underwrites staff time dedicated to selecting and curating content, as in the case of DigiZietschriften, a collaborative database of scholarly articles, where the content selection process is supported by the staff time of its partner institutions.[21]

19 Nancy L Maron, *L'Institut national de l'audiovisuel: Free Content and Rights Licensing as Complementary Strategies* (NY: Ithaka S+R, 2011), **http://www.sr.ithaka.org/research-publications/ina**.

20 Matthew Loy, *Stanford Encyclopedia of Philosophy: Building an Endowment with Community Support* (NY: Ithaka S+R, July 2009). **www.sr.ithaka.org/research-publications/stanford-encyclopedia-philosophy-2009**.

21 Nancy L Maron, *Library Partnership and a Subscription Model for a Journal Database* (NY: Ithaka S+R, July 2009) **www.sr.ithaka.org/research-publications/digizeitschriften-0**.

■ **Content production.** In many instances, scholars undertaking digital projects do not have digitisation expertise or are not necessarily experienced with other technical processes associated with producing digital outputs. Host institutions are sometimes able to provide staff time or resources for producing content. For example, the National Fairground Archive uses funding it receives from the library to build in staff time allocated specifically to digitisation (see below). Pure service units, such as the Creative Media Services team at UCL, also participate in this activity but may charge for their services, albeit at a lower than commercial rate.

■ **Project Management.** In addition to technical or development costs, host institution support may come in the form of staff time — often absorbed by the host institution — dedicated to general project management rather than a single specific project-related activity. Staff time may include project management by digital library managers who oversee a wider set of projects or even the assistance of other academics who sit on an advisory committee, which is what the Projet Volterra[22], a database of Roman legal texts hosted by UCL, has received. Many other projects run by their own leaders could also be said to receive support for project management as a portion of their standard salaries, but this is often due to the devoted project leaders' willingness to volunteer their own time while still carrying full research and teaching responsibilities.
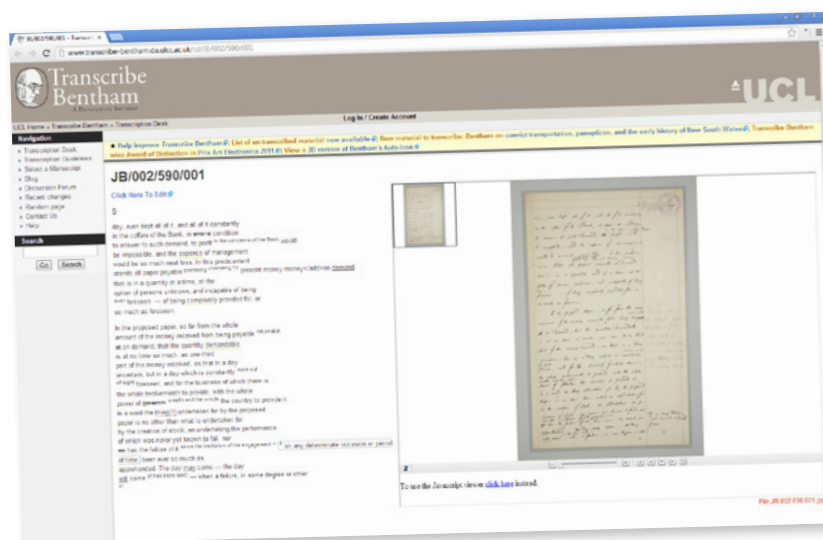
Transcribe Bentham, A Participatory Initiative ©UCL.

5.3 There are several potential partners on any given campus; troubles arise when project leaders only seek them out after the digital resources have been built.

One consequence of late planning is that project leaders may approach their campus library, museum or digital humanities centre seeking safe haven only once grant funding has ended. By this point, the library or other service unit will have only limited ability to respond to last minute ad hoc requests for support and the project seeking support may lack proper metadata, make use of formats that are not currently supported, or simply be concerned with subject matter that is not a good fit with the library's collection strategy. As a consequence, the institution may only be able to provide limited support, if any at all.

This "shotgun marriage" of project and host can be a real burden. As Michael Popham, head of digital initiatives at the Bodleian Libraries at the University of Oxford phrased it, "If [a library is] unlucky, the academics show up after the grant when it's already late in the day", leading to problems including unanticipated costs. One issue may simply be that project leaders are unaware of the troubles their late arrival can cause and some may intentionally avoid the conversation, preferring to go their own way. One digitisation project leader told us that he hoped his library's

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22 Online at **http://www.ucl.ac.uk/history2/volterra/**.

special collection department would take on this collection, though he had not had the conversation yet. The reason he offered for his confidence: "because it's a very small collection — in comparison, it's a drop in the ocean. And it's above all just a preservation project". Although he reported several months later that he had secured support from his university's library, not all projects in those situations will find similar success.

It is more desirable to have project leaders consult them early in the process: "If [the library] is lucky, they'll talk to academics as they go to funding bodies". In those "lucky cases", libraries are able to work with individual project leaders to develop and host projects, discussing everything from planning to managing and sustaining the resource. These early collaborations are still rare but are becoming more commonplace, as enterprising project leaders and proactive librarians actively seek them out. At the University of Leicester, for example, the recent creation of a digital humanities and special collections manager position is intended to help discover projects at an early stage, specifically to "reduce the coming-to-us-too-late problem".

Early planning is greatly preferred by librarians and project leaders alike: it enables a library to build in appropriate budgeting — most often for technical costs and staff time — and develop the project so that it will fit into existing systems in an effective, discoverable way. For example, the Manufacturing Pasts project at the University of Leicester, which created teaching and learning resources about industrial history, collaborated from an early stage with the university library to have the digital resources hosted on university systems. The library coordinated with the Centre for Urban History before the grant was even submitted to help scope and develop the project, which subsequently became based in and managed through the library. Because the library was involved in the process at an early stage, the project was able to ensure that its outputs would be preserved after the end of its grant period. The Zandra Rhodes Digital Study Collection, a project digitising fashion objects, reached a similar agreement with its host institution, the University of Creative Arts. And the CEELBAS language repository for resources for East European language studies draws host support from the digital collections unit at UCL library services.

> The National Fairground Archive (NFA),[23] a collection of materials based at the University of Sheffield that documents the culture and history of fairgrounds and showpeople, started originally in 1994 with the personal collections of a PhD student. As the first major collection of its type, it has now grown into one of the highest profile resources at the university and still continues to digitise and make available additional content.

National Fairground Archive
© 2012 The University of Sheffield

23 Online at **www.nfa.dept.shef.ac.uk**.

> According to Martin Lewis, the university librarian, the NFA has been a resounding success: not only has it continued to bring in a wide audience of users and researchers through inquiries and visits, but it has also continued to secure funding and generate new research over the years. The NFA and its online database, NFA Digital, now draw ongoing support from the university's library in the form of staff members assigned permanently to the archive. Perhaps most striking is the fact that this support grew organically – the library proactively offered support to develop and sustain the project based on its success and impact.

There are projects that, because of their overwhelming impact, publicity, or status in the scholarly community, have arrived at somewhat permanent arrangements of support, whether this means providing the project leader with a full-time position or assigning to it permanent staff who are not project-based. Examples of such projects include the Stanford Encyclopedia of Philosophy, for which Ed Zalta is formally a principal editor; the Thesaurus Lingua Graecae at the University of California, Irvine, whose leaders are tenured faculty; and GalaxyZoo, which was founded by a professor at the University of Oxford.

However, even legacy projects that have demonstrated success in the past do not necessarily have an easy case to make for support.

Take, for example, the recent experience of UCL's Philip Schofield and Transcribe Bentham:

> The Bentham Project [24], one of the 50 Academy Research Projects of the British Academy[25] and one of UCL's flagship resources, aims to make available Jeremy Bentham's entire works. Starting in 1968, the project took responsibility for releasing the entire works of Bentham, first in print and then in digital form as well. Since then, the initiative has developed a robust website, established an electronic journal (*The Journal of Bentham Studies*), published a database with details on Bentham manuscripts held by UCL and developed a crowdsourcing tool, Transcribe Bentham, to type up unpublished manuscripts. The project now lives as an independent department in the Faculty of Laws, from which it draws ongoing support for a full-time director and part-time administrator. The arrangement with the Faculty of Laws, which has been in place since 2004, arose because the resource was seen as valuable, both in general academic terms and specifically for the institution of UCL. (According to the Bentham Project's website, Jeremy Bentham "deserves to be considered as [UCL's] spiritual father".[26])
>
> In 2012, the Transcribe Bentham project drew last minute, ad hoc support after demonstrating a highly successful pilot. Funded by AHRC, Transcribe was originally intended to be a one-year experiment but its success — transcribing over 4,300 complete manuscripts (about 7% of UCL's large unpublished collection) and winning an award of distinction from the Prix Ars Electronica — led to efforts to sustain it past that initial year-long grant. With support from deans of research, the university provided funds for staff time, which helped to keep Bentham going until it received another grant.[27] What it received was not permanent, ongoing support but rather a one-time grant, with no guarantees of future funding.

According to David Price, vice-provost (research) at UCL, institutions are more likely to support digital research resources "when projects are of sufficient value to the institution or to society [...]. It would have to be institutional specific, rather than research-discipline specific". While at UCL "for the moment, there aren't enough [digital projects] to have a formal process", in the case of Transcribe Bentham, it ultimately became clear that "nobody else is going to do this; we must sustain it".

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24 Online at **www.ucl.ac.uk/Bentham-Project**.
25 Online at **www.britac.ac.uk/arp/index.cfm**.
26 For more on the value of the Bentham Project to UCL, see **www.ucl.ac.uk/Bentham-Project/who/bentham_ucl**.
27 Bentham was awarded another grant from the Andrew W Mellon Foundation in 2012 to continue development.

5.4 Decentralised processes make support and discovery a challenge

To refer to the landscape of higher education digital resources as "decentralised" would be an understatement. Universities, colleges, and the many different units within them are all engaging in some kind of digital creation, and on any one campus this can mean dozens or more separate projects cropping up in departments, libraries, IT units, and elsewhere with little coordinating effort. The result, in many cases, is a scattered array of projects that struggle to make themselves discoverable.

At UCL, for example (see inset on pages 26 and 27), at least 23 projects exist, as we attempted to conduct an inventory of humanities and social science digital resources. After these digital resources are made available, they are often left where they stand, hosted on departmental websites, in library catalogues and in data services, among other places, not to mention the rumoured, but quite believable, case of a project living "on the project leader's hard drive on the computer in his office". Clearly, from a preservation point of view, each project may have very different arrangements in place.

This degree of decentralisation is more the norm than the exception in large research universities and has implications for the ongoing support and discovery of the digital resources after they have been built. Project leaders may not be aware of other project leaders on their own campus who have grappled with the same challenges, and may not know where to turn for guidance.

Michael Popham, head of digital initiatives at the Bodleian Libraries at the University of Oxford, mentioned noticing a similar situation at his university: "silos or sub-digital collections [were] scattered throughout the library. [...] Ultimately, the public doesn't have ready access to these!" Links to these collections break regularly, leaving no way to search across the resources as a whole.

A critical step in being able to do this was to inventory all digital humanities content at the university and present it in one place, in order to "provide an external gateway", according to David De Roure, director of the Oxford e-Research Centre, whose team led this initiative, along with partners from IT Services, the Humanities Division and Oxford's Bodleian Libraries. Erin Snyder, a research associate on the Digital.Humanities@Oxford project who assisted in assembling the registry that now numbers over 200 projects, explained that "Oxford has a ton of digital humanities research, and is as decentralised as it gets. By gathering [a list of all current projects], this could help to make a case by drawing attention and gathering more support". The aim was both to "keep a central record that the project exists, and to provide materials helping to navigate the process of creating a digital project". In addition to redeveloping the website, the team created material on support and ran training events. Snyder, who is now digital arts and humanities manager at The University of Nottingham recalled one of the most basic but impactful steps she took to support faculty: developing a communications campaign to let people know about the "human network" available to them, realising that project leaders would appreciate knowing that "there is a person to ask and who that is".

From a user's point of view, this decentralisation may pose challenges as well. Not only is content hosted everywhere, but there is rarely a single source to identify all the digital projects that exist on a given university campus. Discovering these projects, then, requires that they be listed in search engine results (where they are often preceded by resources with more robust search engine optimisation efforts) or that users already have prior knowledge of the resource and its URL. Tony Slade, head of creative media services at UCL and responsible for overseeing UCL's internal digitisation program, recognised this, for the projects his team helped to create: "The problem is we're digitising all these materials and, in many cases, the resultant data is just sitting there". One university head of department reported candidly that though he was aware of some digital resources on campus, "a lot of projects simply get lost".

In recent years, the goal of public engagement has become increasingly important, supported by government funding and adopted in the higher education and cultural sectors as a means to share the nation's wealth with those from a wider range of backgrounds. As Henriette Bruun, school research facilitator for arts and humanities and social and historical sciences at UCL, noted, in order for these resources to be highly used they need "to be prominent — not just something that users have to find". As a first step toward drawing in more and more diverse users, making sure the project is discoverable is of critical importance and some project leaders devote significant time and effort to this. A handful of scholarly digital resources, including GalaxyZoo, eBird, Old Bailey Online, A Vision of Britain Through Time and others, have developed international followings that stretch far beyond the walls of the institutions that support them, and their leaders are conversant in topics including search engine optimisation, web interface design and public outreach. But most project leaders may not be able or willing to offer the ongoing attention this activity requires.

Diving deep at UCL

At UCL, scholarly digital resources — not including articles and scientific datasets — are created and live in many, many places. As part of this study, the research team undertook an "inventory" of projects at UCL, in the Faculties of Arts and Humanities and Social and Historical Sciences. In fact, simply developing this inventory was the most time-consuming part of our deep dive at UCL and required identifying and speaking to dozens of stakeholders at the library, museum, information services, and academic departments.
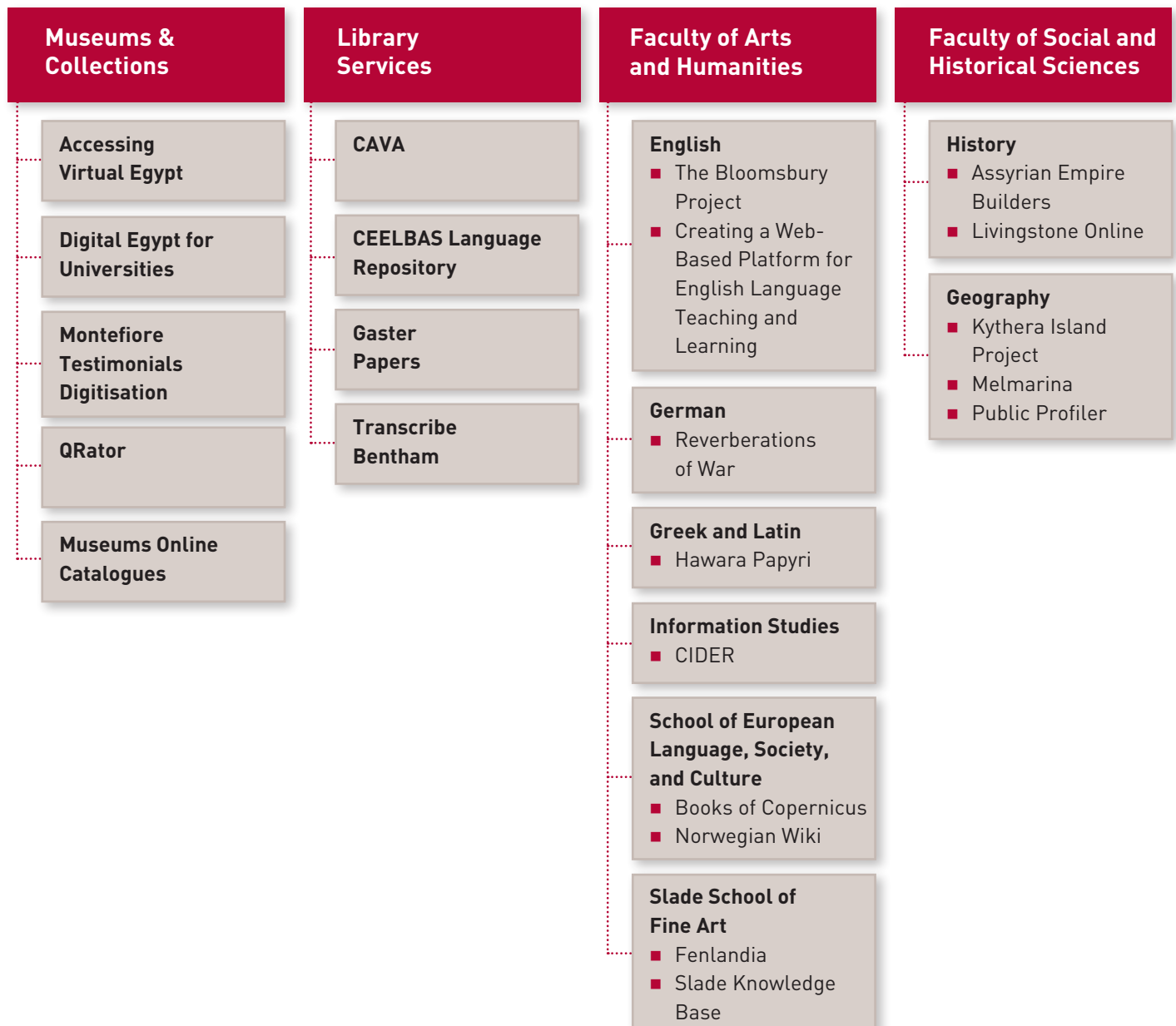
As we quickly discovered, there was no single place and no single person who could identify all the digital projects on campus. In order to compile the following list of project sites, we searched departmental websites and spoke to heads of department and project leaders. Our inventory almost certainly underestimates the actual number as we were unable to arrange conversations with administrators or scholars in all departments, and those we did interview may not have been able to account for all projects in their departments. (For full details on the methodology, please see Appendix A: Methodology.) Findings were shared with an advisory group, consisting of stakeholders in academic faculties, Library Services, and Museums and Collections, who found it extremely useful to have, at a glance, a sense of where the projects were and the issues project leaders were facing.

Our efforts yielded 23 different projects of all sorts — a significantly larger number than many internal UCL stakeholders had expected. Administrators at UCL noted in early conversations that they expected to have maybe a dozen digital projects spread around campus, and expressed surprise at the number and types of projects that were created at many different sites around the institution.[28]

Conducting this exercise demonstrated that there are likely to be many more content-based projects scattered about university campuses than is obvious to most observers. Knowing about the presence of this more robust digital landscape was useful for university administrators. According to Paul Ayris, director of UCL Library Services, "The study has underlined for us [...] the need for a joined-up approach across the sizeable university that is UCL, to ensure that maximum benefit is gained from the monies being spent on the projects. The library will assume this oversight role in future and particularly, as far as digital curation is concerned, ensure that there is a sustainable curation platform for all the AHSS digitised outputs from UCL in future. This work will be embedded into our Digital Curation Team within UCL Library Services".

28 For a glimpse of a comparable situation at University of Oxford, see Erin Snyder's *An Institutional Framework for the Digital Humanities: an Alternative to the DH Centre*, presented at the Digital Humanities Congress 2012 at the University of Sheffield, September 6-8, 2012, **http://digital.humanities.ox.ac.uk/Events/ Snyder_DHFramework.pdf**.

Digital Resources in the Humanities and Social Sciences at UCL

Museums & Collections

Accessing Virtual Egypt

Digital Egypt for Universities

Montefiore Testimonials Digitisation

QRator

Museums Online Catalogues

Library Services

CAVA

CEELBAS Language Repository

Gaster Papers

Transcribe Bentham

Faculty of Arts and Humanities

English
- The Bloomsbury Project
- Creating a Web-Based Platform for English Language Teaching and Learning

German
- Reverberations of War

Greek and Latin
- Hawara Papyri

Information Studies
- CIDER

School of European Language, Society, and Culture
- Books of Copernicus
- Norwegian Wiki

Slade School of Fine Art
- Fenlandia
- Slade Knowledge Base

Faculty of Social and Historical Sciences

History
- Assyrian Empire Builders
- Livingstone Online

Geography
- Kythera Island Project
- Melmarina
- Public Profiler

5.5 Project leaders are critical to success, but often in a precarious position

The precarious nature of digital sustainability is further compounded by the delicate position occupied by academic project leaders. The cast of characters who become "project leaders" is varied. Professors in any academic discipline may apply for research grants to create digital projects and then suddenly find themselves in the role of digital principal investigator (PI), which may more closely resemble being a web entrepreneur than a solitary researcher.

Michael Pidd, digital manager for the Humanities Research Institute at the University of Sheffield, has experience developing and managing various types of projects over the years. He characterised academic project leaders as falling into two camps: some will build resources regardless of potential audience size and regardless of the ultimate impact of the project on the discipline. He refers to this syndrome as "one man and his database" (a reference to the British TV series, One Man and His Dog). "Lots of academics [...] want their website to point at as their resource, and they talk about it, and it goes on their cv [...]. These people rarely use other people's resources, too [...]. To what extent does the system drive people to create things for career progress, as opposed to driving usage of things that already exist? These are the majority of people. They build it and go away and we are left to look after it".

On the other hand, there are the deeply engaged project leaders who initiate projects with a view to making lasting contributions to their field. Pidd describes the leaders of Old Bailey Online as people who are "genuinely creating something of value to their research community and are completely absorbed by that. Some projects create community around them and the people are keen to build upon the success of the resource. [...] With Old Bailey Online, we were able to build some preliminary data sets to attract further funding [...]. Once you create a data set with wide appeal there is a lot of other stuff you can do with it [...]".

Scholars in this mold may be effective advocates and champions of a project, their passion and drive accounting largely for the direction and progress of the work. This can be a great advantage and many projects do indeed prosper due to the single-minded devotion of their founders.[29] Yet even leaders of successful projects may feel uncertain about the professional benefit of this activity, and are keenly aware of the personal and professional risks they may be running by devoting themselves so wholeheartedly to this work. "We struggle with getting project management funded", said one. Another project leader stated that although his ongoing involvement helped develop his project into a significant resource, this may have been a dangerous move for his own academic career as it affected the time he was able to spend on other, more traditional scholarly outputs. "I have many second-author, but not many first-author papers", he reported. "From a pure career point of view [...] this may be a strange direction." Another director of a successful project admitted that, despite the success his project has had securing grant funding and even some advertising, "it wasn't the best career move". Yet another entrepreneurial project leader described his passion for his project, as well as the difficult situation it placed him in: neither he nor his project staff were paid; he had invested his own funds and was putting in up to 30 unpaid hours per week, and had begun to realise that "we cannot continue this".

These scholars are not necessarily wrong to be concerned. The long-held sense of a two-tier system in which traditional research resources are privileged over digital ones has not been fully resolved. As Claire Warwick, vice-dean of research for the Faculty of Arts and Humanities at UCL, reminded us, until very recently, "digital outputs were not considered to be a prestigious form of publication in some universities" and young scholars were often told to avoid anything digital altogether in their early careers. This may be changing, as digital outputs are to be factored into the upcoming 2014 REF, but as several interviewees pointed out, real change may take some time.

29 Examples include the Stanford Encyclopedia of Philosophy (Matthew Loy, *Stanford Encyclopedia of Philosophy: Launching a 'Freemium' Model* (NY: Ithaka S+R, Oct 2011), **http://www.sr.ithaka.org/research-publications/sep-update-2011**); eBird (Loy, *eBird: Driving Impact through Crowdsourcing* (NY: Ithaka S+R, Oct 2011), **http://www.sr.ithaka.org/research-publications/ebird-2011**); and The Thesaurus Lingae Graecae® (Loy, *Thesaurus Linguae Gracae®: How a Specialized Resource Begins to Address a Wider Audience* (NY: Ithaka S+R, Oct 2011), **www.sr.ithaka.org/research-publications/tlg-update-2011**).

In addition to the impact on individual's careers, having a scholar-champion at the helm poses other potential challenges to the long-term sustainability of the resource. While content at a museum or library will not be affected when project managers move on — the institution's digital content will remain and most likely be managed by the next person in that role — what happens when an academic PI moves on?

The notion of a "succession plan" came up in our interviews, but only as project leaders reported not yet having developed one. Even the most successful resources often do not have firm plans in place. The project leader of one popular database told us that, despite his project's usage, averaging about 2,500 unique visits per day, he had concerns about what would happen to it after his retirement. Another told us of his concern that if he were to leave, his resource might be "orphaned". As a US-based project leader reminded us in an earlier study, it can be quite a challenge to find individuals who are both expert in a specific academic field and conversant in the intricacies of running a digital operation.[30]

5.6 Funding styles may not be well aligned with needs of longer-term projects

Academics receive funding to work on projects for finite periods of time and then are expected to move on to receive additional support for new research. Consequently, even digital project leaders who might prefer to spend more time further developing their resources must actively seek new funding sources. One project leader noted bluntly that there is generally no coherent plan in terms of funding long-term projects like his — there is a problem with "short term-ism" or a focus on "the next new thing". Much of this, according to another academic project leader, is due to the current nature of funding: "if you have a short-term funding model that is on a 12-18 month basis, like most grants, it's hard to plan for long-term sustainability [and development]".

5.6.1 Funder mandates for preservation and access

It is increasingly common for funders to set out requirements in the terms and conditions of the grants they make. One funder has described this as "building in sustainability",[31] that is, aiming within the framework of the grant itself to guarantee continuation of aspects of the project after the funding ends. Many funders now include grant conditions stating that resources must be sustained for certain periods of time after the initial grant timeframe. Jisc, for example, has stipulated that a grantee's home institution host content for a minimum of five years.[32] AHRC's grant conditions require "that significant electronic resources or data sets are made available in an accessible depository for at least three years after the end of the grant".[33]

Funder mandates for data management plans appear to be growing in popularity as well, particularly since 2009, when the National Science Foundation in the United States began to require them of grantees. In many cases, these data management plans are more comprehensive than simple preservation requirements; they address hosting, storage and the future access of research outputs, often by naming a trusted site for deposit.[34] The AHRC recently required its revised technical appendix in all grant proposals by applicants seeking support for projects with "digital outputs or digital technologies that are essential to their planned research outcomes".[35]

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30 Matthew Loy, *Thesaurus Linguae Gracae®: How a Specialized Resource Begins to Address a Wider Audience* (NY: Ithaka S+R, Oct 2011), **www.sr.ithaka.org/research-publications/tlg-update-2011**.

31 Nancy L Maron and Matthew Loy, *Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources* (NY: Ithaka S+R, June 2011), **www.sr.ithaka.org/research-publications/funding-sustainability-how-funders'-practices-influence-future-digital**.

32 ibid.

33 "AHRC research funding policy" **www.dcc.ac.uk/resources/policy-and-legal/research-funding-policies/ahrc**.

34 The Data Management Tool, which was developed by a "group of major research institutions" and is provided as a service by the California Digital Library, allows users to build their own data management plans based on funder requirements. See: **https://dmp.cdlib.org/**.

35 The new requirements for the Technical Appendix went into effect on 1 November 2012. AHRC, *Research Funding Guide* (Swindon: AHRC, June 2012) **www.ahrc.ac.uk/SiteCollectionDocuments/Research-Funding-Guide.pdf**.

5.6.2 Requiring cost sharing

Some funders require cost sharing as a way to "build in" support from the early days of a project. While cost sharing can be seen as a pro forma requirement, something satisfied by ticking a box on an application, it plays a significant role in some cases. DigiZeitschriften, a collection of German-language scholarly journals, provides an example of the strength of partnership cost sharing. With funding for this project originally coming from the Deutsche Forschungsgemeinschaft (German Research Foundation), 14 research libraries pledged at the start to provide long-term support and, since 2002, each has contributed subject expertise as the project continues to develop.[36]

Cost sharing may not always be mandated from above. GalaxyZoo founder Chris Lintott credits the project's original reliance on partners with creating a strong foundation of support from the start. "The early [project] grew from a bunch of institutions who donated time [...]. If we had tried to write a grant for this, to pay for our own time, it would have come out as a $200,000 project".

Instead, the initial success of the project encouraged them to create a collaborative model so that each institution must donate a person-year's worth of programming or research, which cannot be grant funded [...]. This, according to Chris, has the dual benefit of making sure the partners are really committed and of running the project like a start-up.

At the same time, there are some models already in place that permit universities to support digital projects. The Department of Digital Humanities at King's College London, for instance, is the locus for all digital humanities activity at its institution, and it has a small fund of £10,000 available for ongoing enhancement for projects. The University of Oxford takes this kind of investment a step further, as initial and ongoing support for digital humanities projects comes from a variety of sites throughout the institution. An ongoing subsidy from Oxford University Press, launched in February 2006, makes available £5 million per year to complement funding from other external agencies. About one-fifth of this funding goes to the Humanities Division, of which about £100,000-£150,000 per year is spent on initial and ongoing support for digital humanities projects of various sizes. But this represents only one supporter in the digital landscape at Oxford; the Bodleian Libraries, the Oxford e-Research Centre, Oxford's colleges, and initiatives through IT Services and Research Services also make sizeable investments toward digital humanities projects. According to assistant registrar (research) Andrew Fairweather-Tall, funds dedicated to digital humanities projects combine, then, to be "considerably more than the [£100,000-£150,000 per annum] figure for the Humanities Division.

In the humanities and social sciences, we observed very few examples of project leaders seeking to leverage their resources to generate revenue from external sources to support their work.[37] Many projects appear to be still experimenting with revenue generation and while even more would be eager to do so, real successes have been rare. Even those open access projects widely considered to be success stories reported revenue in the range of just £5,000-10,000 per year, including some content licensing, some advertising and other forms of donation.[38]

36 Nancy L Maron, *DigiZeitschriften: Library Partnership and a Subscription Model for a Journal Database* (NY: Ithaka S+R, July 2009) **www.sr.ithaka.org/research-publications/digizeitschriften-0** and Nancy L Maron and Sabine Zander, *DigiZeitschriften: A Niche Project at a Crossroads* (NY: Ithaka S+R, Oct 2011) **www.sr.ithaka.org/research-publications/digizeitschriften-2011**.

37 This echoes our findings from earlier studies. See Nancy L Maron and Matthew Loy, *Revenue, Recession, Reliance: Revisiting the Ithaka S+R Case Studies in Sustainability* (NY: Ithaka S+R, Oct 2011) **www.sr.ithaka.org/research-publications/revenue-recession-reliance-revisiting-scaithaka-sr-case-studies-sustainability** and the original set of case studies included in Nancy L Maron, et al, *Sustaining Digital Resources: An On the Ground View of Projects Today* (London: Jisc, April 2009) **www.jisc.ac.uk/publications/programmerelated/2009/scaithakaprojectstoday**.

38 Content licensing and other forms of revenue generation have been explored in further detail in Kevin Guthrie et al., *Sustainability and Revenue Models for Online Academic Resources*, (NY: Ithaka S+R, 2008) **www.sr.ithaka.org/research-publications/sustainability-and-revenue-models-online-academic-resources**.

5.7 A growing role for existing units on campus

On campuses, despite the highly decentralised activity and generally low awareness of the digital content being produced by faculty, there are actually several different institutional actors playing a role, if a partial one, in helping project leaders create, develop, and sustain their digital resources. Libraries, museums, technology departments, and digital humanities centres are among the players that have begun to emerge as potential leaders of greater coordinated digital support on university campuses.

5.7.1 The library

University libraries that have already invested in creating and hosting their own digital content for research or teaching purposes are in a strong position to help others on campus who are looking for guidance or technical solutions. Given their deep roles in supporting teaching and research at their institutions, and the growing prevalence of digital resources in those realms, libraries have begun to consider the support of digital resources to be a critical part of their missions. While the specific activities undertaken by different libraries vary from institution to institution, we found that library activity could be generally categorised in three main ways: basic integration into existing systems; advisory support; and custom solutions.

At a basic level, support models already exist at most institutions, where significant digital collections are integrated into general catalogues and special collections units. Having already developed a digital infrastructure to ingest and host content and metadata, these library systems are able to provide server space and help with creating metadata for other non-library collections and sometimes even integrate these collections into their already well-exposed websites and catalogues. At the University of Birmingham, faculty members do not regularly collaborate with the library in creating and hosting digital resources; still, according to director of special collections Susan Worrall, the library "feels they need some sort of central portal" and thus makes available institutional repositories to collect and store digital outputs — from research papers to digitised image collections — for any researchers who require that basic level of support.

Some universities, however, are beginning to provide substantive advisory support to project leaders. These institutions have realised that, beyond basic technical support, their libraries can play — and indeed, are particularly suited for — further advisory roles in creating and managing data and research outputs. And, as such, some libraries have begun to provide a number of kinds of provision for digital projects, from helping to understand and meet funder requirements, to co-developing projects, to providing hosting, curation, and preservation expertise.

At the University of St Andrews, for instance, in the past project leaders would go to the campus IT unit for support in sustaining their projects. In recent years, project leaders have begun to approach the library for advisory assistance as well. Administrators and project leaders realised that library expertise with metadata, access, publications, and preservation (among other areas) extended to many other facets of project development and sustainability. As a result, the library has become part of a loose working group with IT services and the research office to work with research proposals before they go forward. According to deputy director of library services Jeremy Upton, the library now provides a number of activities and professional knowledge and advice, including hosting, technical support, and liaison with IT and other training requirements.

At the University of Leicester, the library introduced the position of digital humanities and special collections manager to reach out to and support projects based on the "growing demand in the university for help in creating and using digital resources". "Many academics need more support and guidance [around creating and using digital resources]", according to head of library academic liaison Ben Wynne. This advisory role has helped these libraries to identify and work with project leaders from an early stage, as one piece of "an emerging strategy to increase support for academics, particularly in the arts and humanities".

Lindsay Ould, information manager and digital archivist at King's College London (KCL) described its decision to take a more proactive role in supporting research projects creating significant digital content. When she first joined KCL in 2008 she spent time talking with project staff. "It was clear quite early on that people were telling us horror stories about how they had lost data, that they did not know how to manage their data, that they would welcome support." To learn more, her team conducted a study of 200 successful bids across KCL from a range of funders, to see where research data outputs were being created. They found that many projects were relatively small and their project leaders "isolated and in need of guidance" though even the bigger projects had "few dedicated staff".

She is now implementing a plan where library services will act as a "first line of support" answering initial questions and will provide checklists such as "things you need to consider concerning storage as well as training". "Even if we don't know the exact numbers, we will be getting an understanding of amounts of data to allow us to put more accurate costs in the next bid. We think this will help us to develop a formula we can use [...]. It is an iterative process. We'll get better as we do it. Otherwise, people will continue to start their project and a year later realise 'Oh, I need a terabyte of storage'".

A few institutions have gone beyond offering guidance and begun to build platforms or infrastructures to actually host and support projects themselves. At the University of Oxford, the Bodleian Libraries noticed a problem with maintaining and searching across collections at their institution. To address this issue, they developed a platform to bring in digital projects from across their campus and from other institutions across the UK. This platform has been accompanied by a range of support activities "at every stage" to discover, bring in, support, and host digital projects, ranging from digitisation activities to project management to rights clearance, and more. Ultimately, the goal of this programme, according to Michael Popham, Oxford's head of digital initiatives, is to create a solution for building resources in sustainable ways, so that the costs for maintaining them are manageable. According to associate director for digital library programmes Wolfram Horstmann, not only will this effort ensure that the digital content remains accessible and searchable, but "pulling them all together will maximise the digital footprint of Oxford".

At the University of Cambridge, Grant Young, the head of the university library's digital content programme, described a similar platform being developed. He characterised the current support for digital projects at the institution as being fairly decentralised with no common platform for digital resources. The library has initiated a Digital Library Programme, which is a joint effort from the special collections and digital services departments, along with senior managers at the library, which seeks to address the need for a shared platform to deliver digital content. By building a broad and flexible platform, the developers hope to accommodate a wide variety of projects, minimising the number of bespoke tools required to host digital resources and thereby helping to contain the ongoing costs of hosting resources. The goal for this is ambitious: in Young's words, "the library is actively trying to support multiple [digital] activities inside and outside the library and, wherever practical, utilise the shared platform we are developing".

At many institutions, the potential of the library to help develop and sustain projects was immediately evident. Library knowledge and expertise around preservation, access, and user needs was invaluable, and we anticipate that, moving forward, their roles will be critical in a variety of ways, whether in providing a central source of guidance and advice, or with more hands-on approaches, including offering common platforms to host content. As we saw with some notably successful digital resources — the GalaxyZoos and the eBirds of the world — some projects thrive under an independent structure or simply may not need the full suite of support. But there may be many more project leaders for whom just knowing where to turn for guidance will be a great benefit; and for the library, encouraging project leaders to become partners at an early stage will make it possible to develop and host projects whose basic needs for hosting and access will not be at risk.

5.7.2 Digital humanities centres

Digital humanities centres can be beacons to project leaders seeking information about writing grants and developing projects. However, although many entities bear the name "digital humanities centre", they play dramatically different roles at their institutions; each has a different sense of purpose.[39] In the United Kingdom, there are very few universities with anything close to a digital humanities centre at all.[40] Those that do have them include King's College London (KCL) with its Department of Digital Humanities (formerly the Centre for Computing in the Humanities); UCL and its Centre for Digital Humanities the University of Nottingham's Digital Humanities Centre; the University of Sheffield's Humanities Research Centre; Digital.Humanities@Oxford; and the Centre for Research in the Arts, Social Sciences and Humanities (CRASSH) at the University of Cambridge.

While all of these centres play active roles in the early stages of digital resource development, they differ quite a bit when it comes to ongoing support of the projects, once created. KCL's Department of Digital Humanities, for example, actively develops digital project proposals with scholars in a range of disciplines, including those involved in innovative tool development as well as major digitisation projects. In addition, among other services, the centre has consulted specifically on sustainability issues.

The Centre for Digital Humanities at UCL, by way of contrast, has defined itself more around "three different broad activities [...] teaching, research, and outreach and impact work". While faculty members within the centre actively seek out grants to develop projects and tools, the centre focuses on creation and innovation, offering the expertise of an advisory team and helping individual project leaders plan and develop their projects, "so if people want to do things with the humanities, they can come to [the centre] for advice". On the other hand, the ongoing maintenance and development of projects is not an area of focus for this team.

Of those centres that do take a hands-on role with digital projects, most focus more on developing and executing the externally funded project; very few are devoted to the ongoing support and promotion of the work once that phase ends. One exception is the Humanities Research Institute (HRI) at the University of Sheffield which provides a home for innovative research projects, many of them using digital technologies.

HRI offers a suite of services from guidance on grant proposals, to building digital resources and websites, to developing commercial partnerships for their clients.

The team, led by digital manager Michael Pidd, includes just six staff, all of them developers. As of 2012, they have 25 live projects, and have completed many more. About half of their projects come from Sheffield, and the others from other universities and organisations in the UK; expanding beyond the campus has been an explicit tactic to draw the volume of work they need to support their business.

And HRI is a business, not a short-term project. While much of their income comes from being written into grant-funded projects, HRI staff are permanent, not project-based, and the centre must cover its costs, including the servers it rents from the university. "These are real costs for us," says Pidd. "We are not funded or subsidised. We are self-funded, at the moment, but underwritten by the faculty, in the event that things are not as successful as we want them to be."

HRI works with project leaders as they develop their grant-funded projects; their model covers their costs to ingest the content, though content added after the end of the original agreement may cost more. "The charges cover our processing time and data storage costs for five years. After five years, we reserve the right to go back to them to request more, if we

39 Diane Zorich, *A Survey of Digital Humanities Centers in the United States* (Washington DC: CLIR, Nov 2008). www.clir.org/pubs/abstract/reports/pub143.
40 For a listing of UK and European digital humanities centers, see the European Centre for Digital Humanities website: www.allc.org/education/digital-humanities-centres.

need to." Perhaps most important is that the digital resources that are part of HRI Online publications are both peer reviewed, and enjoy marketing support.

One area where he sees his team as very helpful is in making contacts for academic leaders who want to create new partnerships. Pidd's previous experience included "a lot of pitching academic projects to the computer games sector and information sectors." While this sales side can be a "sticking point for academics... we can pick up the phone and help them establish these relationships" as well as helping to provide data files to the partners in the formats they require.

5.7.3 Research data platforms

With funders increasingly demanding that research data be open, the storage question is becoming critical and IT units are finding themselves increasingly involved in supporting research. This is an issue affecting scholarship broadly, not just the sciences. As a recent report issued by the Council on Library and Information Sources (CLR) pointed out, humanities and social science research generates big data too.[41]

At some institutions, including UCL, major initiatives are underway to develop research data platforms. Max Wilkinson, who is creating the Research Data Service for UCL, which is due to launch in early 2013 has entered into a partnership with UCL's library services to develop a platform that will support not just storage and archiving, but the re-use of content as well. In addition to the large scale data generated by researchers in astronomy and physics, the platform will also host smaller collections, including those created by library services. As Wilkinson has pointed out, the goal of the platform is not just preservation and storage but access and reuse as well. The "first step is to have a platform", according to Wilkinson. "Once we have a stable environment, then the fun starts". At that point they can test and refine the service for its users, who will range from researchers depositing data sets to divisions of UCL, such as the library, depositing curated collections.

As it has become more common for funders to mandate data preservation, technology units at universities have come to play active roles in supporting digital projects as the primary providers of server space and technical support. Librarians at St Andrews, for instance, told us that their IT unit has traditionally been (and still remains) deeply involved in supporting and hosting digital projects. A librarian at the University of Birmingham indicated that projects are scattered in many places, including IT. Given the scale of IT units and the vast amount of server space IT has available, IT units are often seen as natural choices to support digital outputs.

Most often, however, IT units are primarily interested in questions of storage, not in other areas such as project development, outreach or other activities or needs associated with projects. Technology units may not always be particularly invested in the success or impact of digital projects and, consequently, they sometimes commit only to minimal levels of support or have limited capacity to accommodate unexpected surges of public interest. We heard from Paul Longley, a project leader at UCL, that the central Information Services Division lacked the capacity to handle the huge traffic that his resource, Public Profiler, received after major coverage in national newspapers and other media. In another, an academic administrator told us about paying for her own backup because she couldn't "trust [her university]'s infrastructure". In still other cases, departments with native programming and computing expertise simply choose to create and host their content themselves.

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41 Christa Williford and Charles Henry, *One Culture. Computationally Intensive Research in the Humanities and Social Sciences* (Washington DC: CLIR, 2012).
www.clir.org/pubs/reports/pub151.

5.7.4 Other collaborations

One of the chief benefits of digital humanities centres, libraries and other units that aggregate content is their potential scale. Some projects can become self-sustaining but, in the projects we studied for this and earlier reports, we have found that many of the most successful projects benefit from an environment of ongoing support. Some disciplines or even subjects are such fertile ground for this sort of work that they may have support labs devoted to this work. Such is the case of eBird, the open access, citizen science platform, which is part of the Cornell Lab of Ornithology.[42] While the eBird project itself is in many ways a model of entrepreneurial success, it lives as part of a larger unit, the Lab of Ornithology, and benefits from the stability that this infrastructure can provide by attracting grants and by supporting revenue-generating activity. eBird is fully open access, and Birds of North America is the subscription-based reference tool that helps to subsidise the eBird effort. Similarly, Chris Lintott, founder of GalaxyZoo, stressed the value of collaboration. Not only does volunteer and community support help his project but, with several projects running at once (as became the case as GalaxyZoo grew to become Zooniverse), it is also more likely that there are multiple sources of support available to the project at any given time.

Clearly some universities have already begun to take active steps to consider how to best provide systems of support for digital content their faculty and staff create. Some solutions take on technical challenges and address them at scale, like the data platforms that can be built to suit many types of digital information across all disciplines. Others are more a matter of guiding people to use the services already in place at the library, the IT department and other units on campus. In either case, the current environment, while well suited to supporting research and its outputs, often falls short when faced with the challenges of ongoing digital resource projects. A coherent digital policy — one that draws on all of these elements — from early review, guidelines on costings and deposit standards, to forecasting what ongoing activities will be needed and who will carry them out — would ideally remove much of the risk of "digital time bombs" while obliging both project leaders and university leaders to take a moment to envision the ongoing impact they want these resources to have, and how to best achieve that.

eBird.org
© Audubon and Cornell Lab of Ornithology

GalaxyZoo.org, A Zooniverse project.

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42 Matthew Loy, *eBird: Driving Impact through Crowdsourcing* (NY: Ithaka S+R, Oct 2011), **http://www.sr.ithaka.org/research-publications/ebird-2011**.

6. Museums, Libraries and Archives: Sustainability in the cultural sector

The image of the lone academic project leader, a fearless pioneer on the frontier of the digital landscape, may seem, well, risky. Without technical, legal, or other support from an institution, she must secure support and provide everything needed for her project to survive and perhaps grow. For some project leaders, this may literally mean tackling every role, from content selection and creation to digital production and web interface development. This can be costly and, as we have learned, those costs do not vanish post-launch.

While libraries and museums technically "host" the content they create, this role is fundamentally different from that of the universities discussed earlier. Projects born within — and supported by — existing organisations such as museums and libraries start from a very different place. The core values of collecting and preserving content and sharing it widely with the general public permeate these institutions. This coherence of mission offers, at minimum, a baseline of support — although that baseline is relative to the institution — which may include secure platforms, mechanisms for outreach and strategies for preservation for their "home grown" digital collections. This provides digital content creators at museums and libraries with a safety net not enjoyed by their academic counterparts.

While acknowledging the tremendous diversity that the label "museum" or "library" can mask, in this section we will attempt to outline some of the broader trends we have been able to discern during the course of our study. The fine art installed at British Museum may have little in common with the specimens of mouse skeletons on offer at UCL's Grant Museum of Zoology but, in some important ways, their institutions share common characteristics: unlike individual scholars on an academic campus, museums and libraries are accustomed to selecting, acquiring and curating content. Unlike scholars or other university representatives, their missions typically include both some degree of long-term preservation and care of the material they collect, as well as a strategy for publicly sharing that collection. Most often, these institutions are centrally managed and at least have the option to implement standards in a way that would be difficult for most universities to consider.

Do these characteristics, then, offer a clear path for sustainability, or even lessons for those in an academic setting?

The answer is not a simple yes or no. While projects born within an existing institutional structure certainly benefit from their "hosts", the degree to which this activity is centrally coordinated seems to vary within the sector, and the mere presence of a range of organisation-wide services does not necessarily mean that they are always regularly or effectively put to use in the service of developing and enhancing the impact of digital content projects. While academic project leaders may face riskier futures, there are benefits to having a devoted leader running a project. Furthermore, as we will illustrate in the sections that follow, the notion of "centralised" activity is far from standard, and determining which activities are best done at scale is still very much a work in progress.

6.1 Museums, libraries and the web: from "brochureware" to digital collections

For many years, museums and libraries traditionally served the public by providing physical access to materials that were often rare or unique. The advent of the web provided opportunities for them to offer a new means of actively sharing that content with a wider audience as well as preserving the objects by protecting them from too much wear and ensuring future physical access. [43]

In the early years — and in some cases still today — decisions about what to digitise were often made ad hoc, project by project, and were spurred by funding calls or other opportunistic triggers rather than according to any strategic plan designed by the "host" institution. At the Imperial War Museums, for example, this approach resulted in over one hundred isolated databases scattered in different departments throughout the organisation. Early generation museum and library websites were often not much more than "a mix of brochureware, basic visitor information, and 'tasters' from their collections", according to one recent Museums and the Web conference talk[44] compared to the interpretive text- and interactive application-heavy websites of some major libraries and museums today.[45]

Since those early days, it has become clear to many that that the web presents an unprecedented path of access to the riches held by museums and libraries. The annual survey conducted by the UK's Department of Culture, Media and Sport has found that, for the past three years, the 17 institutions they sponsor have received on average three times as many virtual visitors as physical,[46] and an article in the New York Times cited the Getty Museum's online users as tallying almost ten times that of those who cross their threshold.[47] Those who are content to browse the online collections seem willing to trade direct access to the "authentic" object for the benefits of more immediate access to its digital surrogate.

The cultural heritage website is becoming an end in itself and museum leaders have begun to emphasise the website as a platform for staff to build relationships with users and share their knowledge, rather than simply post advertisements of opening times and their collections in an effort to drive foot traffic. Some institutions have sites that now accept and display user comments and have mobile surrogate or supporting applications, while others experiment with allowing users to select and annotate their own collections or stock their own bookshelves from the institution's digital holdings.

The high numbers of online users and the increasing complexity of digital outputs created to serve them has raised the stakes for the websites and digital projects of museums and libraries. In response, it is no longer uncommon for major museums and libraries to have explicit digital or online strategies, aimed at maintaining and improving digital production while ensuring quality and uniformity for the sake of their institutions' brands. Furthermore, digital strategies often include either calls for or descriptions of formalised protocols and standards for quality control and enhancing discovery, as well as procedures for ensuring staff are trained properly and thus able to meet those standards. As engagement with users has supplanted simple "access" as a goal, many cultural institutions' policies underscore the importance of outreach activities as well as user

43 On access see William Y Arms, *Digital Libraries* (Cambridge: MIT, 2000), 4. On the prevalence (and limitations) of the view of digitisation as preservation, see the interview "Preservation in the Digital Age", in *Conservation Perspectives: The Getty Conservation Institute Newsletter*, 22.3 (Fall 2007). The forthcoming Ithaka S+R study of ARL member libraries also found that over 50% of representatives from ARL institutions viewed "preservation, as a way to protect fragile originals" as a very motivating factor in their institution's decision to digitise their special collections.

44 A Burnette et al, "Redesigning Your Museum's Web Site: A Survivors' Guide", in *Museums and the Web* 2009: Proceedings, ed J Trant and D Bearman (Toronto: Archives & Museum Informatics, 2009), www.archimuse.com/mw2009/papers/burnette/burnette.html. See also Caroline Dunmore on the typical "evolutionary scale" of museum websites, from "no web presence" up through the "website constituting additional museum site". Located in "Museums and the Web", in *The Responsive Museum: Working with Audiences in the Twenty-first Century*, ed Caroline Lang et al (Burlington: Ashgate, 2006), 95-114.

45 See, for example, The Museum of London's website (www.museumoflondon.org.uk), which allows visitors to search their collection by borough, promote the museum through social media, play games within the context of the museum's purview, download podcasts and mobile applications that touch on the collection, and read "pocket histories" about specific periods and places in London's history. Additionally, the highly praised, newspaper-like Walker Art Center website (www.walkerart.org), which has thousands of short- and long-form postings and articles about art at the Center and the work of the Center's staff.

46 Department for Culture, Media and Sport, *Sponsored Museums: Performance Indicators 2010-2011* (London: DCMS, November 2011) http://www.culture.gov. uk/images/research/Sponsored_Museums_Performance_Indicators_2010-2011.xls.

47 Carol Vogel, "Three out of Four Visitors Never Make It through the Front Door", *The New York Times*, March 29, 2006.

tracking and assessment as a crucial means to understand users and plan future programmes. At conferences such as the annual Museums and the Web, curators and organisation leaders discuss best practices for writing and implementing digital strategies, share their own experiences, and forge informal partnerships to make the digital transition smoother. As Koven J Smith of the Denver Art Museum has said, "collaboration between institutions is a necessity" in order to see what works and does not work in this new frontier.

6.1.1 A drive to centralise: Three case studies

Throughout our interviews with those at libraries and museums, it became clear that many considered it a core component of sustainability to extend their role as the "hosts" of this content by developing a unified digital infrastructure and digital workflows in order to centralise and mainstream the activities required for that content's creation. This drive to create systems and structures was viewed as a means of supporting digital content in many ways. First, in permitting an institutional mission to be propagated throughout the organisation so that all units are working towards common aims. Second, in encouraging the emergence of standards for production. Third, in creating core infrastructure that permits use and re-use of the content held there. And finally, in offering the possibility of platforms that can aggregate audience. Within the last decade major institutions have taken active steps to revamp their systems to make this possible, and these modifications are often described as transformational and requiring significant changes to organisational structures and workflows long in place.

At first glance, museums and libraries appear to face challenges fundamentally different from institutions of higher education. Unlike universities, who often play the role of reluctant, passive, or simply unaware host to a great deal of digital content created by their scholars, museums and libraries tend to be the ones initiating this work and are eager to build and maintain these collections. As the examples below illustrate, some institutions have taken significant steps to tackle one specific matter: creating unified collections and digitisation strategies. Yet, getting to this point has not been particularly easy and does not address all of the issues that come with hosting and maintaining content to be valued by their users.

The three sketches below offer as illustration examples of institutions that have each, in the recent past, undertaken significant steps to create digital strategies that stress the value of having a unified, centralised workflow at their core. UCL's Museums and Collections division, the National Library of Wales (NLW), and the Imperial War Museums (IWM) have done this for different reasons, but each cites their internal coordination as a key factor in their efforts to sustain the digital content they have created. The sketches below describe their different approaches: UCL's push to draw together several teaching collections on their university campus; the National Library of Wales' early promotion of building native digitisation capacity and expertise into the organisation; and the Imperial War Museums' recent consolidation of over one hundred databases into a central catalogue as well as their current reconsideration of which activities are best served centrally and which require specific subject-area expertise.

Case study A: UCL's Museums and Collections division – From cardboard boxes to a central catalogue

Over the past decade, the creation of a shared database and a limited digital catalogue for a few of the institutions in UCL's Museums and Collections (M&C) division has helped to provide them with an opportunity to expand and reach beyond their initial status as teaching collections. M&C manages four campus museums: the Art Museum, the Grant Museum of Zoology, the Petrie Museum of Egyptology, and the Geology Collections, as well as other collections used primarily for teaching and research.[48] According to Sam Washington, digital resources manager, in the past, "digitisation was driven mainly by individual curators, who sought to improve access by digital

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48 In addition to these four publicly available collections, UCL M&C is also responsible for other collections used primarily for teaching and research.

means", but without necessarily adhering to a strategic collections plan. While curators taking on the role of individual project leaders would occasionally seek guidance from staff at M&C concerning costings of their grant proposals, no strategic coordination covered all of M&C's digital activity and planning and the individual collections focused on their own immediate cataloguing needs.

In 2011, the M&C team began to discuss the practicalities of centralising digitisation activity for the shared online database they had already been working on in a less coordinated way for several years. The database had been a long-term dream of the museum curators, some of whom had been struggling with their own backlog of content in an effort to apply for accreditation as public, rather than teaching, museums. The database provided the foundation for the integration of as much of the collection practise — digital and analogue — across the museums as possible. As a way to move towards the centralisation of digitisation specifically, Washington worked with a committee of curators from each museum to define the parameters of the database and to try to develop some standards for documentation that would suit all; this was no easy task given conflicting standards of, for example, periodisation (some collections preferred to measure time in terms of artistic movements and others in geological eras) and style of image capture (some objects could be adequately photographed using a digital camera, while others would be better served by an MRI scanner).

Today, the ad hoc content selection for digitisation in place just a couple of years ago has been largely replaced by a central review process in which digital projects that UCL museums want to pursue must demonstrate that they will have an immediate and direct use to the university community. To do so, they are evaluated by two committees, one to measure the project's potential benefit to teaching at the university and the other to assess the project's value for research. Projects considered lacking in either or both categories must undergo further review by departmental management and/or adjust their bids to satisfy the aims of M&C. Other digitisation work not initiated by the curators themselves is generally the result of initiatives from faculty who wish to use the museums' resources in their teaching. These projects are still ad hoc, but they are considered worthwhile, as they can lead to more regular, long-term relationships with faculty.

Once created, the digital images are then placed in a new content management system. All of the management and documentation of the digitised images is left to Washington, while UCL's Information Systems Division tends to the data storage.

University College London
©UCL

At the Grant Museum of Zoology, for instance, curator Mark Carnall estimates that only about 1,000 or so of the 68,000 objects in its holdings are used in teaching each year. He sees the benefit of digitisation in the multifaceted uses it allows: once that resource is created and stored in a protected environment, the Grant Museum can prepare it for use in different settings. It can be added to its virtual learning environment, packaged as an open educational resource and incorporated as a reference image for collections care. Of the thousands of physical objects that have been digitised and stored in the M&C central management system, only around 700 live in its online catalogue.

While having the catalogue certainly provides a baseline of access to the holdings of the collection, it does not solve all problems. Carnall disagrees with the still pervasive belief that, "if we stick our database online, then we reach six billion people; done". Rather, project managers need to think about outreach, what their users actually want and what the museum is equipped to provide. But there are a few reasons why the Grant Museum has found it challenging to think about what it can do to attract virtual visitors: most of its holdings are not unique and can be found in one of many zoological digital collections; in any case, it is unlikely that users searching the web for, eg, "penguin egg" will land on the Grant Museum's webpage and, if they do, that they will be satisfied with the database entry the museum provides rather than the detail other sites offer. One way the Grant Museum has tried to combat this situation is to use their digital resources as a way to engage more deeply with onsite visitors. One example of this effort has been the development of a QRator project with colleagues from UCL Digital Humanities and UCL Centre for Advanced Spatial Analysis that allows visitors to scan QR codes located throughout the museum and thereby learn more about the objects they are encountering as well as comment on them. Carnall believes this initiative, which earned the Grant Museum a Museums and Heritage Award for Excellence in May 2012, will help to "break down science as something that happens behind the scenes, or [in] a black box". So far, the QRator project has already helped the Grant Museum to adjust its display choices by debunking common wisdom that onsite visitors dislike replicas, casts and models and by bringing to the curators' attention that use of certain terms like "race" is viewed as problematic by some visitors.

Case study B: Imperial War Museums – Development of a coordinated strategy to support and exploit digital content

IWM's effort to coordinate digitisation across its wide-ranging institution has involved constructing a system that enables staff and departments to repurpose digitised objects for multiple outputs. A "family" of five museums in England (three locations in London, one each in Manchester and Duxford), IWM has undergone a dramatic transformation in the past few years, explicitly aimed at more clearly centralising its decision-making processes. The basic groundwork for these changes was laid in 2006 when IWM received a three-year Public Sector Research Exploitation grant to commercialise its extensive film collection by digitising it and streamlining the related processes. At the time it received the grant, IWM had 140 unique databases holding information about its collection, so it took the opportunity to create a collections management system that could bring together all of that data in one system.

When the current director-general Diane Lees started in 2008, the migration to centralised systems had already prepared the way for the dramatic structural changes that she would soon enact. Employees who had been grouped by content type (film, photography, art, posters, etc) were repositioned into departments based on function (eg, curation, collections management and digitisation) so that the workflows for digitisation projects would be more explicit. Lees encouraged a new focus on leveraging IWM's growing digital collection for the purpose of reaching online users, whose numbers far exceed those of visitors to the museum's buildings.

To support that initiative, Lees created a new post, head of digital media, which Carolyn Royston filled in 2009. Soon after Royston arrived, she put into action a comprehensive digital strategy that established mechanisms to support Lees' emphasis on the digital sphere as an outreach tool as well as Lees' related reminder to staff that "one project can have multiple outputs" and that one of these can be digital.

Today, IWM not only offers a free, unified and searchable catalogue on its website, but it also exploits the materials it has digitised for multiple ends. Digitised images and film are integrated into the online learning resources that the IWM offer teachers and are presented with context in mobile- and tablet-based applications that link to social media for sharing and commentary. They are sold to private individuals and businesses alike as high-quality digital copies and souvenirs.[49]

To assess the progress of the website and set new targets, Royston meets monthly to review web analytics with a cross-functional group from the digital media, marketing, and retail teams at IWM. A dashboard presents key statistics to the digital programme group, a cohort of senior stakeholders who set priorities for development and pinpoint areas for improvement. While usage is tracked closely — the number of site accesses is up 21% over the last year, when the new site first launched — there is also renewed interest in understanding audience engagement, and Royston's group is in the process of determining how to assess and share feedback gleaned from social media channels, including the museum's own MyIWM social interpretation tool.

While the centralisation of the core infrastructure and production at IWM has created a common base, Royston reports that recently the museum has shifted strategy, identifying areas that, in fact, would be better served by those outside her digital group. She can imagine staff and departments outside of the digital media team will become increasingly involved in producing their own digital content and in actively reaching out to audiences through the web. A recent experience with social media and commenting made it clear that the curators on staff should be brought back into the digital process; who else could meaningfully respond — or even evaluate — the array of reader comments offered on the website? Members of the commercial and online learning teams have also begun reaching out. As digital learning officer Charlie Keitch prepares materials for teachers and students for the upcoming First World War centenary commemorations, he has liaised with a colleague who is already working with an historian to create podcasts for the programme so that Keitch can integrate the IWM's work with his.

The retired Battleship
"HMS Belfast"
©① Mostaque Chowdhury,
Attribution 2.0 Generic

Imperial War Museum
©① Stephen Boisvert,
Attribution 2.0 Generic

49 IWM is also experimenting with licensing its digital holdings for sale in other commercial venues. On this, see Dominic Sacco, "BLE 2012: The IWM seeks licensees", *Licensing.biz*, October 5, 2012, **www.licensing.biz/news/9972/BLE-2012-Imperial-War-Museums-seeks-licensees**.

Case study C: The National Library of Wales – Reorganisation to facilitate flexibility

Anyone travelling to Aberystwyth from London will have the pleasure of a leisurely train ride or two through rolling hills, pastures, and, finally, marshlands as the coastline of Wales grows near. The nearest large cities are themselves around 70km away, making Aberystwyth a true "destination" site, but not one that benefits from a great deal of pass-through traffic. Over the past decade or so, in response to its physical remoteness and increasing pressure from the Welsh Assembly to justify government spending, the NLW librarian Andrew Green has begun to develop an ambitious audience strategy to transform the library from an academic institution serving researchers to an institution that could be adopted by a greater slice of the Welsh population. The physical space of the library was opened up, some areas were designated as exhibit spaces and a visitor centre was created in 2004 to encourage visits by a wider audience, including school groups, family historians and the local community.

The role of digital resources figures prominently in Green's long-range strategy. With 85,000 visitors to the library grounds and nearly two million unique visitors to the library's website each year, it became clear that having a strong online presence would be a way for the NLW to enlarge its footprint from its home seat in mid-Wales. Indeed, documents describe the NLW as "two National Libraries: one in the building at Aberystwyth, the other a virtual library available to everyone in Wales via the internet".[50]

According to Green, "At a very early stage, well over ten years ago, we decided that the structure of the library was not fit for purpose, and we changed it so as to deal systematically with the digital world, which was all over the place before: it didn't really have a home anywhere". Today, the library has put into place a collection strategy and digitisation workflows that speak to a more coordinated approach. The strategy has two anchors. The first is a series of core content programmes. The largest, called the "Theatre of Memory", is a collection of what Green hopes will one day encompass all printed materials "of Wales and the Welsh" that "lay(s) bare", as the description on the website declares, "the memory of our country so that it is seen, as it were, at a glance, by anyone in the giant auditorium that is the world wide web".[51] This strategy reflects both an opportunity (and perhaps a responsibility) that the NLW sees in acting as the host for collections now distributed in many forms, freely, across the country.

The National Library of Wales, Aberystwyth
©①② Dylan Moore, Attribution-ShareAlike 2.0 Generic

50 Andrew Green, *The National Library of Wales: A ten minute tour* (Swansea: LlGC NLW, Aug 2011) **www.llgc.org.uk/fileadmin/documents/pdf/TMTpdf.pdf**.
51 National Library of Wales, *The Theatre of Memory: Welsh print online* (Swansea: LlGC NLW, June 2011), **www.llgc.org.uk/fileadmin/documents/pdf/Welsh_print_online.pdf**.

To implement this vision, Green and his staff have reorganised the NLW so that work is arranged by function, rather than projects, and a digitisation workflow is part of the everyday operation of the library. This approach was made possible by an early decision to use core funding to support digitisation work, giving the NLW the opportunity to bring in and retain experienced staff, while other libraries and museums have chosen to outsource this work. While it still seeks outside funding for major digitisation projects, such as the Jisc-funded major digitisation project on the First World War[52] now underway, the work is largely done in-house: digitisation is all done on site although OCR is outsourced. This means that while the digitisation group must bring in funding through grants or other fees each year, any extra capacity can be used to further build and enhance the library's digital content base, giving them, in Green's words, "at least [...] a very modest base for doing things ourselves".

This infrastructure then provides the second anchor of the programme: a carefully developed plan for ingesting and preparing content in such a way that it is secure, accessible, "flexible" and able to be re-used in different ways for different audiences.[53] Extensive attention is devoted to creating metadata for content at the point of ingestion, but the staff are quick to point out that as important as getting the data infrastructure right is consideration of how it will be viewed and used. As one staff member noted, "we have made great processes for integrating new projects coming on stream; for the back end, this is [now] easier. [...] The difficulty comes in sustaining the front end".

6.2 Lingering challenges for ongoing support

As the examples above illustrate, museums and libraries certainly benefit from the ability to set and coordinate policy from the top in a way that may be elusive for those wrangling digital content scattered throughout a university campus. Yet, even though the system-wide approach may offer a degree of security in terms of ongoing preservation, hosting and metadata standards, there are other elements critical to the long-term support and vitality of digital content that are not necessarily covered by even the most rigorous process of creation.

First, despite the benefits of centralisation, the mere presence of a catalogue and centralised repository does not ensure greater usage of or engagement with its holdings. For example, a couple of years ago, John Stack, head of the Tate Online, noticed that among its more than 70,000 digitised materials, only around 300 saw any significant traffic, leading him to take steps to encourage more browsing, including devoting a section of each item's page to helping users "find similar artworks" according to subject, style, decade and other categories. Other museums, such as IWM and the NLW, have begun, or are planning to develop, more interactive and interpretation-heavy websites, mobile applications, podcasts, videos and more in an effort to engage with users on multiple platforms and — and, for some museums — in entirely new ways. After the Denver Art Museum released its new website in the first half of 2012, it created a blog with what have proved to be popular "behind-the-scenes" videos and short articles that shed light on the previously veiled everyday practices of museum work.

Second, many institutions devote considerable attention to the upfront creation of content, but not nearly as much to its ongoing enhancement or reuse, resulting in collections that are certainly present in the main catalogue, but otherwise exist only as capsules of content, frozen in time. Interfaces may become difficult, design may be outdated, and content that could be updated to keep pace with the state of the field or new acquisitions is often left as is. As one director pointed out, at his institution they are aware that they "put in much more resource and much energy and much more intelligence into the creation of digital material and far too little on the user interface, impact. [...] There's a need for new rebalancing maybe slightly away from questions of creation and associated activities [...] and towards the user experience".

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52 Rhyfel Byd 1914-1918 a'r profiad Cymreig / Welsh experience of World War One 1914-1918 is funded through the Jisc e-Content programme from 2012-13.
53 National Library of Wales, *Digital preservation strategy, 2012-2015* (Swansea: LlGC NLW, 2012), **www.llgc.org.uk/fileadmin/documents/pdf/Digital Preservation Strategy 2012-2015.pdf**.

Another digitisation manager echoed that theme:

"We digitised collections 12 years ago. And we left them there, so they are still in the state they were 12 years ago and renewing or enhancing or [...] making them useful to today's audience is something that we haven't really thought about. We mentioned it in our strategy, but [...] finding the resources to do that is difficult when managers here at the library [and] outside vendors are always looking towards new content rather than refreshing or renewing your old content. [If] you are going back and doing the same old thing in a different way, they're not interested."

Third, while audience demographics can be fairly easy to gauge when patrons or museum-goers cross the threshold, good information concerning the demographic composition of the online audience — whether for the entire institution or for specific online resources — can be elusive. More needs to be understood concerning not just who the users are, but how they use the site and what they use it for.

Finally, one of the benefits of the museum or large library setting may also come with its own particular challenge: while a specific digitisation grant will certainly include someone in a project management role, once the project is finished, management of the digital resource is not always clear. Head of digitisation description and legacy acquisition Lyn Lewis Dafis of the NLW noted that recent changes in its internal organisation have further complicated this question: "Who is responsible for managing the digital collections, after the digitisation? Whose responsibility is it? [...] In part, this [question] may be due to the assumption that once digitised, the content is sustainable just by virtue of living in the digital asset management system and by living in the central catalogue. However, the risk here is that there is no one tasked with reviewing usage, assessing needed upgrades, or thinking editorially about the project or the content or how to best maximise its impact".[54]

In recent years, institutions have sought to address the project management issue Dafis describes by creating new posts to tend to digital content strategy, including Royston's role as head of digital media at IWM and Lorna Hughes' role at the NLW as chair in digital collections. These posts have been created in order to, in Royston's own words, "champion digital at the highest levels of our organisations, supporting and positioning it as something that should be central to organisational thinking".[55] This does seem to signal an important shift, and yet it is clear — at IWM and NLW and elsewhere — that digital leaders are still seeking the right balance between investing in digital infrastructure and in driving impact; between building systems to store and preserve content and in developing methods for disseminating it to the world; between creating new content and using and reusing the content that has already been digitised. The fact is, these activities are all important, and determining how to seamlessly integrate them all is the great challenge before us now.

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54 This echoes a finding in a recent study of American Association of Research Library members (forthcoming from Ithaka S+R, January 2013). Of the 55 project leaders who reported on specific projects, 24% were run by committees or teams of people and 58% were run by someone who also was responsible for several other projects at the library.
55 Carolyn Royston and Charlotte Sexton, "Navigating the Bumpy Road: A Tactical Approach To Delivering A Digital Strategy" (paper presented at Museums and the Web 2012, San Diego, CA, USA, April 11-12, 2012), **www.museumsandtheweb.com/mw2012/papers/navigating_the_bumpy_road_a_tactical_ approach_**.

7. Conclusion: Towards solutions for sustaining digital resources

Despite general acknowledgment of the importance of digital content, many open questions remain. The last decade and a half has seen a real flowering of digital content in the academic and cultural sectors. What is only beginning to emerge now, however, are the first outlines of what a future system might look like to support it all. Academic digital resources, those dynamic online projects that may include digitised and born digital material, have moved well beyond simple PDFs of scholarly articles and collections of digital images. They may certainly include collections of digital objects at their core, but these are often wrapped in customised elements, from user interfaces to functionality developed to suit the unique needs of the project, to original user commentary generated by site users. The best of these projects do not only allow their own creators to conduct original research, but also permit others to work with and build upon the content they hold in a variety of ways.

Today, there appear to be two poles emerging in the different types of support for scholarly digital resource projects.

At one extreme, we see a class of complex and thriving projects, with robust user bases, evidence of engagement and success in gaining either a long series of grants or some institutional support. These projects, in various ways, can point to support and recognition from users and the communities they serve. Success may not be measured only in financial terms, but is grounded in use and re-use through partnerships with others who are engaging in new research projects using the valuable corpus of content amassed in the project. And this ability to demonstrate impact can lead to deeper forms of institutional support, including full-time positions and other in-kind contributions. In case this scenario appears too rosy, let us not forget that even successful and experienced project leaders may struggle to identify a reliable support base; they may devote hours and hours to tending to the project even though they might feel it detracts from their building more "traditional" academic careers.

Leaders of projects such as these intend to continue developing these resources; they are nearly evangelical in their belief in the value of their work and the potential it holds for themselves and others; and they are tireless in seeking out new ways to enhance, support, and grow their project. For them, success looks a lot like it might for any start-up in the business world: they need to continue to increase their impact to users, to identify means of support, and to invest in the activities this requires.

At the other extreme we see many projects that were never really conceived of as ongoing "enterprises" in the first place. They may be more "traditional" digitisation projects, resulting in collections of digital objects, whether images, manuscripts, or audio files. A library may invest in digitising a rare collection of manuscripts, for example, and will be certain that it is created to institutional standards, with harmonious formats, quality, and metadata. Post-creation, though, its delivery strategy is to serve up the content through, for example, the main catalogue. The content may be available for users to search, and for other staffers to draw from, whether to use as a highlight on the website or to recombine for exhibits with other elements also in the catalogue. In this case, the scholars who created the content have done their job once their content is created and safely deposited; ensuring that users can find and use the content now falls to the team managing that platform.

The real challenge, particularly in the academic sector, lies with those projects that fall between these two extremes. Perhaps the grantee originally conceived of the project as an independent website, but has since chosen to move on to other projects, having accomplished what he set out to do. He may have hoped to continue but failed to identify ongoing sources of support and been obliged to gently "abandon" the work. Or perhaps the project was always conceived of an effort to digitise content and this particular task has been completed.

Clarity concerning project aims and needs
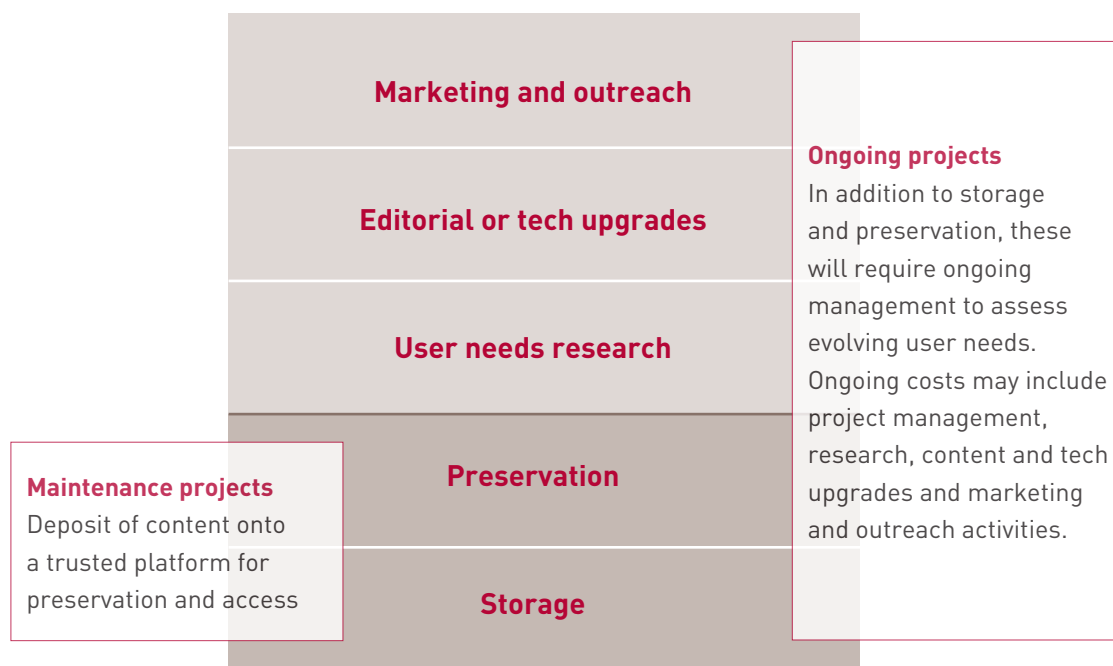
While all digital content projects require a base level of storage, preservation and access, some will also need a more robust suite of activities in order for them to remain valuable to users.

These projects, without a "champion" – someone whose task is to evaluate or assess its success, usage, or other impact measures over time – may suffer as a result. Without ongoing strategic leadership or planning, these projects may sit on a departmental or library server where they are benignly neglected, not developed, actively promoted, or otherwise enhanced. Unlike a book or journal article, which enters a system of publication or distribution and receives an ISBN, ISSN, or other unique record of its existence, these projects are at real risk of vanishing from the scholarly record. For the moment, the content they house may still be findable via the web if one knows where to look, but without someone to determine that changing user needs are being met, the effects of shifting Google algorithms and increasingly discriminating users will eventually conspire to render the website all but invisible.

Universities today host a great deal of this content. If we are to imagine that UCL's situation is typical, then there is much of content living quietly throughout universities across the UK, still siloed, and without either being actively managed, or at least living on some platform that itself is being tended to for the needs of its users. The research data platforms and services have been an important start in the right direction, but are strong solutions only to the basic functions of storage and preservation. Bridging the gap from storage to usage and impact requires a wholly different set of activities, and these are often not addressed.

University administrators can help to address this challenge in several ways, first by taking stock of the degree of activity taking place on campus. Discovery solutions may be as simple as offering a central registry of links to digital projects, or as complex as requiring deposit into a centrally managed platform. Assessing the ongoing needs of these projects will be important, too; some

may be running quite well under the direction of devoted managers who can articulate their needs. Other projects may be languishing, and it may be that their content would be better used, if made part of some larger aggregation, perhaps part of a library catalogue. In either case, this wealth of material, if considered strategically as the reflection of the intellectual activity and public engagement of a university's scholars, must surely be more than the sum of its parts.

But even before content becomes the responsibility of the university, funders and project leaders can play a vital role in reshaping the process, from content creation to dissemination. A clearer delineation of the roles of those who create scholarly content and those who help it to reach an audience is needed. Some academics who build digital resources may relish their entrepreneurial role, seeking out new ways to promote their work, keeping abreast of changes in user needs, and developing creative means to support this work. But most will not. Clearly defining which projects will need a "simple" deposit strategy, and which are aiming to be ongoing dynamic resources is a good first step.

To some extent, museums and libraries present models that may prove useful in thinking about digital content projects in the scholarly world. Though many have yet to develop a formal digital strategy, some major institutions have already invested in moving from highly decentralised structures — not entirely unlike the current landscape of research universities today — to systems that are premised on the creation and maintenance of core catalogues, with new content ingested following agreed-upon metadata schemas, formats and protocols that permit data migration, and multiple uses. The primary benefit of these systems is in their ability to streamline processes and to simplify the workflows, creating a central, searchable catalogue that encompasses the digital holdings of the organisation.

And yet, as many project leaders have said, while the structuring of data is a necessary condition, it is not sufficient. Skins, interfaces and customised layers that guide users and provide context are critical for drawing users into the digital content, helping them to navigate and contextualise it. And while the central database "catalogue" model does scale well in one sense, the development and ongoing enhancements for the front-ends do not at all. Museum and library directors are finding that once the technical infrastructure is in place, it is still the hard work of editorialising, repurposing and reusing content that helps to drive its impact. And these tasks can be time-intensive and require subject expertise.

Libraries and universities have begun to confront these issues today in a variety of ways, as digital content becomes increasingly embedded in their cultural fabric. And while some institutions may choose to address this by seeking local solutions, whether creating repositories or seeking deeper integration with Google or other external discovery services, others may choose a different approach. Some may look to community-run or other independently managed platforms. By that logic, of course, it is expected that the leaders of those destination platforms are actively engaged in a set of activities from preservation to outreach to optimising content for discovery that will in turn ensure that potential users have the best chance of finding the content they seek.

Going forward, the questions will be no less complex and cultural and academic institutions will need to have sound digital strategies in place to address them: How will legacy content be transferred to the digital environment? How will new scholarly creations be evaluated for inclusion in digital collections? What rights management is needed for content that may have many types of potential uses, both on and off-site? How will the broader movement towards online learning affect the need for and heavy consumption of digital scholarship? As the demand for and volume of content grows, as online educational offerings continue to proliferate, sustainability of content will depend not just on its preservation, but on its discovery, use and impact. Defining the role of digital content within the broader mission of the institution, and determining the degree to which an institution will manage those activities itself or find someone else to do this, will determine the future of scholarly and cultural digital landscape for years to come.

8. Recommendations

Funders:

- **Clarify sustainability needs when awarding grants.** Some projects have greater sustainability needs than others. The proposal stage is often the time to identify and distinguish between grant projects that are likely to yield content needing ongoing support and tool development, and grant projects for which a "deposit" strategy is sufficient. This may have more to do with the intention and personality of the grantee than with the project itself. Project leaders who see their work as finished outputs should have clear plans for where they will deposit it; those who would like to see the work continue should be required to have more carefully articulated plans for what that will involve.

- **Challenge unrealistic impact statements.** While "impact" statements are now common in proposals, many funders have complained that (like sustainability plans) they end up being "one more box to tick". No one can predict the future but funders are in a unique position to press grantees to demonstrate deep knowledge of and interest in further understanding the end users of their work. This does not mean listing *more* potential audiences ("scholars in all disciplines will find topic x very valuable") but rather listing specific audiences, with an understanding of their size and the value they will find in the resource, based on something more than guesswork and wishful thinking.

- **Encourage — or require — grantees to think creatively about how their content will best reach an audience.** This includes, but goes beyond, talking about marketing and promotion. In some cases, projects may be better served in identifying alliances with other projects whose audience base is well-established.

Academic project leaders:

- **Be realistic in assessing the future needs of the resource you are creating at its outset.** Sustainability, for many projects, involves more than just preservation or deposit. To ensure support for additional activities that may be required, clearly define them from the outset, and avoid seeking last-minute support.

- **Be realistic in assessing your own interest** in devoting time to this, post-grant. Is this a great but short-term project? Or something that will be developed over the course of many years?

- **Identify campus partners early on.** Whether the project is closed-ended or something more ambitious, project leaders should start as early as possible to secure host support, whether through a digital humanities centre, library or other campus unit with the staff and technology capacity that will be needed. Project leaders should build in costs of preservation and storage, but also seek goodwill and partnership with the colleagues whose support they will need later on.

- **Consider how central your project is to the overall mission** of your institution. Project leaders engaged in mission-critical projects stand much greater chances of gaining central support than those that have little to do with the focus of the whole.

University leaders:

- **Consider to what extent current activities could be drawn together to create a deeper network of support**, both for "maintenance" projects and those with the potential to really grow. Right now, universities have a wealth of support structures, but entrepreneurial project leaders must often seek them out on an ad hoc basis.

- **Develop guides to encourage good practice.** This could include identifying sources of support on campus — from business units, legal guidance, tech support and outreach — to help project leaders build stronger proposals; introducing a screening process for "digital time bombs"; and creating guidelines for costing the indirect forms of support projects will require, so that these can be factored in early on.

- **Consider developing unified, coherent ways to help users find content once it is created.** If not aggregating, at least creating an inventory of digital scholarly resources is a good first step for maximising the impact of the content faculty and librarians create. Support for those project leaders who seek out creative ways to share and promote this widely would be even better.

- **Draw attention to the importance of engagement to drive impact.** Some university efforts are beginning to address storage and preservation, but few have yet addressed engagement and outreach. There may be more room to draw together campus resources for outreach, engagement and business strategy to support project leaders looking to maximise the impact of their work.

- **Determine where scale solutions really pay off** and where subject and resource experts are the best placed to advance a project. Universities certainly do not want to tread on the subject and audience knowledge that resides in the minds of project leaders. But providing certain services relieves some of the burden from project leaders and offers many benefits to your institution, from aggregating audience to reducing costs, while still permitting independence and creativity these projects require. If a repository - whether on campus or elsewhere - can offer not just storage and preservation, but ongoing attention to driving usage through outreach as well as coordination with major discovery solutions, this can permit scholars to focus on their strength, creating scholarly content.

Leaders of cultural organisations:

- **Take advantage of central coordination** to create a core technical infrastructure for preservation and ongoing support and development that is efficient and standardised.

- **Look beyond the catalogue.** A central catalogue is a necessary but not sufficient solution for sustainability. Active outreach and user research are still necessary for bringing users to the website, just as it is for physical holdings and buildings.

- **Engaging users and driving impact is widely done, but not always directed at supporting digital initiatives and projects.** The needs and interests of virtual visitors are likely to be different from those who cross your thresholds; investing in understanding how they use your resources and what they want from them will help you better serve your audience.

- **Centralise or distribute responsibility?** Museums and libraries must find a balance between those activities that should stay with the content producers and those that can be taken on by staff with technical, marketing, or other non-content-based expertise. This difficult but worthy quest can help to underscore the flexibility of digital content for use and reuse by different departments to a greater variety of ends.

Appendix A: Methodology

Our research for this study took place in two phases: landscape research and a deep dive stage.

Landscape phase

A landscape research phase allowed us to understand the general environment and the perspectives of stakeholders involved with creating and supporting digital content throughout the UK. We began with desk research examining UK-wide trends in the higher education and cultural heritage spheres, from university funding levels to open access mandates, by consulting news articles, reports and papers, and other published literature.

Desk research was followed by a series of interviews with stakeholders working with digital content from a variety of perspectives at universities, cultural heritage institutions, and funding agencies. In order to ensure a diverse, representative range of interviews, we selected interviewees to include a range of different institutional contexts. For academic institutions, we used Russell Group membership to identify major research institutions. However, the Russell Group represents only 24 of the top universities in the UK, leaving out some top institutions such as the University of St Andrews and the University of Lancaster (among others), so non-membership in the Russell Group was not sufficient to establish an institution as a teaching-focused university. In order to identify other, less research-intensive universities, then, we turned to the "University guide 2012: University league table", a set of university rankings published by the Guardian, to understand relative university rankings in the UK. The primary categories for the interviewees at these different types of institutions were project leaders, officials at both universities and cultural heritage organisations, and other experts involved with digital content.

Project leaders were identified first through a combination of prior knowledge and desk research to include grantees from a range of major UK funders. This initial list was then supplemented by a number of other projects that we identified through our other interviews with project leaders, administrators and other institutional management officials.

While identifying project leaders was relatively straightforward, the "administrator" perspective proved to be quite complicated. We quickly found that identifying administrators who were responsible for overseeing, approving and managing digital projects was a complex task, as a range of stakeholders fit those roles, from academic administrators (such as department or faculty heads) to university management (such as deans and provosts), to administrative and research support officers and other staff at libraries, museums, and universities. To identify these individuals, we selected institutions based on proof of digital activity, either through evidence of projects developed or hosted there, or through the presence of digital humanities centres or other units designed to support digital content. We then reached out to those who, based on their titles, seemed most likely to work with digital resources at those institutions.

While librarians were not initially set aside as a separate category in our segmentation, they were particularly attuned to issues of hosting and advisory support, and provided a very helpful administrative viewpoint. We identified librarians through a similar process of desk research and referrals, most notably from Mike Mertens, deputy executive director of RLUK, who helped us to identify appropriate contacts at RLUK member institutions.

The full list of interviewees included project leaders, curators, librarians, academic administrators, university management, officials at cultural heritage institutions, funders and various other experts and is available in Appendix B. The interview guides that structured our conversations are available in Appendix C.

In the landscape phase, we conducted 40 interviews with people from 30 different institutions. In some cases, interviewees spoke to us from their multiple perspectives — for example, an interviewee may have come under the "project leader" category while also playing an administrative role — but each interviewee is counted only once in the summary table below. We also conducted additional interviews with project leaders, administrators, officers of cultural organisations, and other experts as part of our deep dives at UCL, the National Library of Wales, and Imperial War Museums, but these are not included in the below grid. Furthermore, our understanding of the "funder" perspective was supplemented by interviews and research conducted for an Ithaka S+R study published in June 2011, "Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources".

Role	Institution type	Count	Total count
Project leaders	Russell Group	6	12
	Non-Russell Group	6	
Administrators (including library directors and staff)	Russell Group	11	13
	Non-Russell Group	2	
Funders		3[57]	3 plus 26 interviews from 2011
Cultural organisations		7	7
Other experts		5	5
			40 total interviews

Deep dives

To supplement the landscape review, the research team selected and examined three institutions in greater detail, to understand what sorts of projects exist at the institutions, the ways in which these projects are developed and the support that they currently from their institutions. The three institutions are extremely different and, as such, the particular questions we asked and the stakeholders we interviewed varied by site.

In each case, however, the goal was the same: to understand the landscape of digital content creation on the campus, the support structures in place for them, and the digital strategy, both tacit and explicit, that govern the sorts of support the institutions provide for them.

At each institution, we conducted site visits to meet with project leaders, administrators, and other key individuals playing important roles in the ongoing support of digital content. We worked with designated point persons at each institution to help us navigate the organisational structures at each of the deep dive sites and identify and schedule conversations as needed.

UCL

As a major research university, UCL was by far the most complex institution, and required much more on-the-ground research than the other two deep dives. Just identifying the digital content projects on campus was not something to be taken for granted; this was the only site where we conducted a partial inventory of projects and launched a formal questionnaire to learn more about them.

As a major research university, UCL plays host to a massive amount of research – £283.4 million in 2011 – with a particular interest in digital outputs that has resulted, in recent years, in the growth of the Centre for Digital Humanities and the development of the UCL Research Data Service. At the same time, it became clear that at the time, UCL did not have a unified content strategy, so could be an interesting example of how a research university was dealing with the digital resources created

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56 The research team conducted three new interviews for this study; the other funder data was drawn from the set of 26 interviews conducted in 2011, as part of a previous JISC-funded study. Nancy L Maron and Matthew Loy, *Funding for Sustainability: How Funders' Practices Influence the Future of Digital Resources* (NY: Ithaka S+R, June 2011), www.sr.ithaka.org/research-publications/funding-sustainability-how-funders'-practices-influence-future-digital.

by faculty and staff.   Our early conversations with Sally MacDonald, director of museums and public engagement, and Paul Ayris, director of library services, were all very productive, and gave the research team hope that UCL would be a good partner in this study.

Our methodology for studying UCL involved interviews with stakeholders and a survey intended for project leaders. Sam Washington, digital resources manager in the Museums and Collections unit, served as our main point of contact and helped to identify and interview stakeholders at UCL. As the process continued, it became clear that others were equally interested in the outcomes of this work, and so in April 2012, a few months into the project, a broader steering committee coalesced, helping to guide the rest of the work. This group consisting of representatives from Library Services, Museums and Collections, Research Data Services, and the academic faculties we were interested in:

UCL Steering Committee:

Paul Ayris, director of UCL Library Services

Sally MacDonald, director of UCL Museums and Public Engagement

Martin Moyle, acting group manager, IT Services and Bibliographic Services, UCL Library Services

James Steele, vice-dean (research), Faculty of Social and Historical Sciences

Melissa Terras, co-director, UCL Centre for Digital Humanities

Claire Warwick, vice-dean (research), Faculty of Arts and Humanities; co-director, UCL Centre for Digital Humanities; head of department, Information Studies

Sam Washington, digital resources manager, UCL Museums & Collections

Max Wilkinson, head of research data services, UCL Information Services Division

We met with members of this group during a site visit in late January 2012, on 24 April to review progress, and again on 8 October to share preliminary findings. Early discussions with members of this group were invaluable in guiding us to narrow the scope to just humanities and social sciences, to grant us permission to reach out directly to academics, and to suggest where they would find the most value in this study.

First, to understand the structure, workflows, and perspectives of those at the university, we arranged interviews with various stakeholders including project leaders, librarians, university management, heads of department, and other academic administrators. Based on our initial observation of the scale of the university — consisting of ten academic faculties, which are further divided into 123 departments and centres — and with the encouragement of the steering committee, we decided to more tightly focus our investigation on those people and their projects within the faculties of Arts and Humanities and Social and Historical Sciences. We did this primarily to narrow our scope to a more manageable population, but also because the challenges faced in the humanities seemed more acute, without the support that a well-funded lab can provide.

In total, we spoke to 27 different individuals at UCL from a variety of units to develop a fuller picture of the activity at the university. (The full list of these individuals is listed in Appendix B.)

Second, to gather more specific information on individual projects hosted at the university, we created and distributed a questionnaire for project leaders, asking about the development process, initial and ongoing costs and activities, and impact of their resources. Our initial methodology for disseminating this survey relied on vice-deans of research to forward the questionnaire to heads of department, who would then forward the survey to all academic staff in their departments. This proved to be an ineffective way to reach scholars due to the additional two layers between the research team and the targeted respondents for the survey (project leaders); ultimately, we received only two completed responses through this method.

Instead, we began to speak directly with heads of department and project leaders to identify the projects hosted in their departments. These interviews initially were scheduled simply to gather a list of all relevant projects in the departments we contacted, but evolved into more nuanced conversations about digital outputs.

Despite these efforts, it is still likely that we were unable to identify all digital content projects within the two faculties we surveyed. This was because, despite repeated contact with heads of department, we were unable to reach representatives in seven departments; and some heads of department were new to the job, and did not necessarily know about projects that were created prior to their tenure. Then, there were those projects we saw online, but whose PIs had since left UCL.

We then developed a list of 19 potential respondents, to whom we sent the survey on 19 June. The survey remained open for about one month, closing on 11 July. Non-respondents were sent weekly reminders to encourage them to respond, and we allowed extra time for those who had written to us asking for this. In total, we received complete responses from 8 project leaders concerning 12 projects.

While the resultant data was difficult to draw large-scale findings from, the process of administering this survey and developing a list of projects proved to be of great interest to administrators at UCL. Findings from this "inventory" of projects were shared with the steering committee in early October.

Imperial War Museums and the National Library of Wales

Our deep dive cases at the Imperial War Museums (IWM and the National Library of Wales (NLW) took a different path. Both institutions have clear and centralised methods and practices for creating digital content so identifying the collections did not pose a challenge.

Rather, in addition to conducting interviews at each site (eleven at NLW and six at IWM), we worked with staff at NLW to develop and test a tool more useful to them, a means of assessing the status of digital projects, the impact they have and the resource they will need in the future. This became the Health Check Tool and is included in this report under the Toolkit Section, on page 78.

Appendix B: Interviewees

Landscape Review

Lorraine Beard, head of digital technologies and services, University of Manchester

Karen Brookfield, deputy director of strategy and business development, Heritage Lottery Fund

Sheila Cannell, director of library services, University of Edinburgh

Heather Caven, head of collections management and resource planning, Victoria & Albert Museum

David De Roure, director, Oxford e-Research Centre, University of Oxford

Alison Dickens, assistant director (programmes), Centre for Languages, Linguistics & Area Studies, University of Southampton; OpenLIVES

Stuart Dunn, lecturer, Centre for e-Research, King's College London; Digital Exposure of English Place-names

Colette Fagan, professor; faculty associate dean (research), University of Manchester

Andrew Fairweather-Tall, assistant registrar (research), University of Oxford

Peter Findlay, programme manager, digitisation, Jisc

Neil Forbes, director of research, Coventry University

Bill Greenlaw, executive director, Archives, Museums and Libraries, Nova Scotia Department of Communities, Culture and Heritage

Gary Hall, research professor of media and performing arts, Coventry University; Open Humanities Press

James Harris, senior lecturer in modern European history, University of Leeds; The Faculties project

Tim Hitchcock, professor of 18th-century history, University of Hertfordshire; Old Bailey Online

Wolfram Horstmann, associate director for digital library programmes and information technologies, University of Oxford

Natasha Hutcheson, regional museum development manager, Norfolk Museums and Archaeology Service

Rob Iliffe, professor, Department of History, University of Sussex; Newton Project

Martin Lewis, director of library services; university librarian, University of Sheffield

Chris Lintott, co-founder, GalaxyZoo and the Zooniverse, University of Oxford; GalaxyZoo

Paola Marchionni, programme manager, digitisation, Jisc

Maja Maricevic, head of higher education, the British Library

Teresa McConlogue, thinking writing advisor, Queen Mary, University of London; School of Languages, Linguistics and Film

Kerstin Mey, director of research and enterprise, University for the Creative Arts; Zandra Rhodes Collection

William Nixon, digital library development manager, University of Glasgow

Lindsay Ould, information manager and digital archivist, Archives and Information Management/Library Services, King's College London

Michael Pidd, digital manager, Humanities Resource Institute, The University of Sheffield

Michael Popham, head of digital initiatives, University of Oxford

Koven Smith, director of technology, Denver Art Museum

Erin Snyder, digital arts and humanities manager, University of Nottingham

Humphrey Southall, reader in geography, University of Portsmouth; Great Britain Historical Geographical Information System

John Stack, head of Tate Online, Tate Museum

Ann Stevenson, information manager, Audrey and Harry Hawthorn Library and Archives, Museum of Anthropology, University of British Columbia

Simon Tanner, director, Digital Consultancy, King's College London

Vanessa Toulmin, director of National Fairground Archive, University of Sheffield; National Fairground Archive

Jeremy Upton, deputy director of library services, University of St Andrews

Matthew Woollard, director, UK Data Archive, UK Data Archive

Sue Worrall, director of special collections, University of Birmingham

Ben Wynne, head of academic liaison, University of Leicester; Manufacturing Pasts

Grant Young, digitisation and digital preservation manager, University of Cambridge

Deep Dives

Imperial War Museums

Gael Dundas, head of collections management

Kay Gladstone, senior curator, film archive

Charles Keitch, digital learning officer

Diane Lees, director-general

Carolyn Royston, head of digital media

David Walsh, head of digital collections

National Library of Wales

Sara Branch, strategy and research manager

Illtud Daniel, head of IT

Manon Foster Evans, head of reader services

Andrew Green, librarian

Lorna Hughes, chair in digital collections

Avril Jones, head of collections

Lyn Lewis Dafis, head of digital development

Sally McInnes, head of conservation

Owain Roberts, business transition manager

Glen Robson, head of digital asset management

Scott Waby, head of digitisation services

University College London

Bas Aarts, professor of English linguistics; director, Survey of English Usage

Rosemary Ashton, Quain professor of English language and literature; Bloomsbury Project

Paul Ayris, director of library services

Dave Beavan, research manager, Centre for Digital Humanities

Suzanne Beeke, head of research, Department of Language and Communication; CAVA

Henriette Bruun, research facilitator, Faculties of Arts and Humanities/Social and Historical Sciences

Mark Carnall, curator, Grant Museum of Zoology

Susan Collins, head of department, Slade School of Fine Art

Oliver Duke-Williams, lecturer, Department of Information Studies; CIDER

Jon French, head of department, Department of Geography

François Guesnet, professor, Department of Hebrew and Jewish Studies; Montefiore Testimonials Digitization Project

Andrew Hudson-Smith, director, Centre for Advanced Spatial Analysis

Marta Jenkala, senior teaching fellow, SSEES; CEELBAS

Dilwyn Knox, director, SELCS

Paul Longley, professor, Department of Geography; Public Profiler

Simon Mahony, teaching fellow, Centre for Digital Humanities

Gesine Manuwald, head of department, Department of Greek and Latin

Martin Moyle, acting group manager, IT Services

David Price, vice-provost (research)

Vieri Samek-Lodovici, head of department, Department of Italian

Philip Schofield, director, Bentham Project; professor, Faculty of Laws

Tony Slade, head of UCL Creative Media Services

Melissa Terras, co-director, Centre for Digital Humanities

Claire Thomson, head of department, Department of Scandinavian

Claire Warwick, head, Department of Information Studies; co-director, Centre for Digital Humanities

Sam Washington, digital resources manager, UCL Museums & Collections

Max Wilkinson, head of research data services, Information Services Division

Appendix C: Interview guides

Project Leaders

Project background and impact

- Tell us about the project and how it was started.

- What types of materials does the project include?

- What is the current status of the project?

- What are the primary audiences for this project?

- How do you define the impact of this project?

- What metrics do you use to measure and evaluate this impact?

Project development process

- How was this project initially funded?

- Who was responsible for approving the grant for developing this project?

- What guidance did you receive in developing your proposal?

- Is there any oversight of the project now? Is this the same person/place as the one that approved the grant?

Expectations

- What expectations did you have for host support when you first started this project?

- Did your host institution have any expectations of your project?

- Did you discuss these expectations before the grant?

- If so, what form did this arrangement take?

Costs and support

- What costs were associated with the development of your project?

- What activities / costs does it incur right now? Include both costs/activities for maintenance, as well as all activities for enhancement. (eg, marketing, updates, etc.)

- How are those costs or activities covered? By whom?

- Are there any revenue generation activities that you've experimented with? What activities are these, and to what extent have they been successful?

- Are there other forms of support you wish you could get?

Current role of the host

- What sort of in-kind contributions do you get from your host institution?

- Why is this project valuable to others? To your host institution?

- How do you measure this value?

- How do you communicate this to administrators or other higher-ups?

Librarians

Background

- What are your personal responsibilities at the library?

Structure of the institution

- Within the library, where do digital projects "live?"

- Who is responsible for initiating, approving, and managing these projects?

- Are there any existing mechanisms or systems for tracking these kinds of projects/resources or costs/budgets?

- Are there any institutional (or library-wide) initiatives for developing, supporting, or aggregating digital content? What prompted these initiatives?

Support for individual projects

- How does the library "sustain" the collections it has created?

- Does the library support projects that others bring to it? If so, what type of support do you provide?

- Do projects approach your department seeking assistance after their grant periods are over? Do you take these projects on?

- If so, how do you make the decision whether to host them or not?

- What support do you provide for these projects?

- Are there any systematic structures for supporting these projects?

- What expectations do you have of these projects, in terms of their requirements from the library, project leaders' ongoing roles in supporting these projects, and the level of activity of these projects moving forward?

- What is the value — to the institution, to the library, or otherwise — in supporting these projects?

- In terms of digital content issues (assuming these are somewhere on the agenda!), have you seen a meaningful difference between how they are handled for the sciences and humanities?

Following up

- Who else might we contact at your institution to learn about other perspectives on these projects? Project leaders, administrators?

Administrators

Project approval

- What is your role at your institution?

- How are you involved with digital content projects?

- Please describe the project approval process in detail.

- What factors do you consider when deciding whether or not to approve a project on an individual level?

- Are any rejected? If so, why did you reject them?

Project expectations

- What do you expect operationally from these projects when funding them?

- In general, how do you envision the futures of these projects? Actively maintained, or completed then deposited somewhere?

- What are the factors that would lead you to recommend one or the other?

Value and relationship with the institution

- We think there may be two types of concerns that senior administrators may have that this study would help them with. In your experience, to what extent are these actually on the radar for campus leadership?

    a. The "hidden costs" of carrying so many digital resources, post-grant or post-launch

    b. A coordinated content strategy for all of the digital content created on campus

- At what level are these issues now being addressed?

- Are they framed differently? Is "cost" a major issue, for example, but not necessarily the cost of digital content?

- What other needs/concerns do senior administrators have concerning digital content creation/sustainability?

- What sorts of support does the institution provide to these projects?

- What factors determine whether you will provide assistance for projects?

- What value does your institution derive from supporting these projects?

- Are there any institutional initiatives for developing, supporting, or aggregating digital content? What spurred the creation of these initiatives?

Ongoing thoughts about projects

- How do you communicate with project leaders? What topics do you discuss with them?

- Are there any ways that these resources should operate differently?

- Are there any administrative or institutional concerns that *you* have concerning these projects at an individual or academic level?

Appendix D: UCL project leader questionnaire

The questionnaire below was administered to project leaders at UCL. The methodology we used to identify project leaders and distribute and analyse the survey is available in Appendix A. A more generic version of the following questionnaire that can be adapted for your own use is also included as a Word document in the toolkit accompanying this project at **www.sr.ithaka.org/digital-content-and-host-institution-support-strategies-uk**.

Digital Content and Host Institution Support Strategies

The non-profit research organisation Ithaka S+R is conducting this Jisc-funded study to better understand the support that digital projects receive from their host institutions. We hope that by understanding more about the digital projects UCL, we will be able to help project leaders and university administrators in planning for the long-term support that digital projects may require.

By digital projects, we refer to academic or scholarly projects that are now publicly available on the internet. This includes, but is not limited to, projects such as:

- A thematically coherent collection of digital content as a result of digitisation or born digital materials

- A research tool for scholars

- A website that actively engages users through its content, innovative tools, user interface, etc.

- A database of content (eg, in a specific discipline) intended for teaching purposes

Questionnaire details

We expect that this questionnaire will take about 30 minutes to complete fully. Your detailed responses will help us create a complete picture of the landscape at UCL. Please answer as many questions as possible; approximations are acceptable. Questions that you do not feel comfortable answering, or that require too much effort to answer, may be skipped.

Please complete this questionnaire by 11 July 2012. If you are not able to complete the questionnaire in one sitting, you may return later and resume where you left off. You will need to enable cookies and use the same computer and browser when re-accessing the questionnaire. If you have questions, please feel free to contact us:

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1. Please provide the following contact information.

Name _____

Title _____

Department _____

Email address _____

Phone number _____

2. Please enter the name of the project on which you are reporting.

3. Please enter the URL for this project.

4. What department holds primary responsibility for this project?

○ Library Services

○ Information Services

○ Academic department (please describe) _____

_____

_____

○ Non-department academic centre or institute (eg, Centre for Digital Humanities)
　　(please describe)

_____

_____

○ Other (please describe) _____

5. In what year did this project first become available online?

6. Which of the following statements best describes how this project is currently managed?

○ This project is primarily managed by an individual or group whose chief role is to make key
　　decisions about this project on a full-time basis (eg, a full-time project manager for the
　　project).

○ This project is primarily managed by an individual or group who also oversees several other
　　similar digital projects (eg, a director at a digital humanities centre or library)

○ This project is primarily managed by an individual or group who primarily has other academic
　　responsibilities (eg, a professor who also runs a digital project)

○ This project does not require ongoing management (eg, deposited in an institutional repository
　　with no updates)

○ Other management structure (please describe) _____

_____

_____

7. **Is UCL currently the primary home for this project?**

○ Yes

○ No

If respondents answered (No) to Question 7, they were redirected to Question 8* instead of Question 8, and exited the survey after completing 8*.

8*. **Please briefly describe why UCL is not the primary home for this project, and where the project is currently managed instead.**

_____

_____

_____

You have reached the end of the survey. Thank you for your participation! Your input is invaluable in forming a picture of the activity at UCL. We anticipate that the results will help both project leaders and university administrators and management to develop valuable, sustainable digital projects. When you click to the next page, you will exit the survey and be redirected to our website. If you would like to edit your answers before submitting them, you may click the back button below and edit them now.

If you have any questions or comments, please feel free to email the study's lead author, Nancy Maron, at **nancy.maron@ithaka.org**.

The following questions concern the initial creation of your project.

8. **Who was responsible for approving the initial creation of your project? Include, if relevant, the administrative position that was responsible for approving the funding for your project (eg, grants, partnership agreements, funding from the university). Check all that apply.**

☐ Library director

☐ Information services head

☐ Academic department head

☐ Non-departmental academic centre head

☐ Vice-provost

☐ Dean

☐ Other (please describe) _____

_____

9. **What were the sources of funding for the creation of this project? Check all that apply.**

☐ Grants

☐ Base budget from your home institution

☐ Earned income (eg, via sponsorship, advertising, subscriptions, etc.)

☐ Donations or individual philanthropy

☐ Other funding sources (please describe) _____

☐ Not applicable

If respondents did not select "Grants" in Question 9, they skipped to Question 11.

10. Approximately how large, in pounds, were the grant awards used to create this project?

_____

11. Approximately what percentage of the total direct costs for the creation of this project was covered by each of the following sources? Please enter whole numbers between 0-100. The total should add up to 100.

Included here was an array of sums with number fields for each of the options selected in Question 9:

(Options selected in Question 9)	Percentage of total direct costs
Grants	
Base budget from your home institution	
Earned income	
Donations or individual philanthropy	
Other funding sources	

12. What types of support did your host institution provide for the initial creation of this project? Check all that apply.

☐ Direct funding or cost-sharing

☐ In-kind contributions (eg, office space, staff time)

☐ Other (please describe) _____

_____

☐ None — our host institution was not involved in supporting the creation of this project

If respondents did not select "In-kind contributions" in Question 12, they skipped ahead to Question 15.

13. What types of in-kind support did your host institution provide for the initial creation of this project? Check all that apply.

☐ Project management

☐ Content selection

☐ Content production (eg, scanning, metadata creation)

☐ Information technology or support services (eg, server space, tech support, website development)

☐ Preservation

☐ Marketing and outreach

☐ Legal services

☐ Financial and accounting services

☐ Indirect costs (eg, office space, supplies)

☐ Other (please describe) _____

_____

☐ Not applicable

14. Please briefly describe how in-kind host support contributed to each of these activities (eg, the number of FTEs drawn from your host institution's budget and the specific activities involved).

Included here was a table with text fields for each of the options selected in Question 13.

(Options selected in Question 13)	UCL helps us by...
Project management	
Content selection	
Content production	

15. Were there any external partnerships involved in the creation of this project?

○ Yes

○ No

If respondents selected "No" to Question 15, they skipped to Question 17.

16. Please briefly describe these partnerships.

_____

_____

_____

The following questions concern your project after its launch.

17. What activities do you undertake for the ongoing maintenance or development of this project? Check all that apply.

☐ Project management

☐ Content selection

☐ Content production (eg, scanning, metadata creation)

☐ Information technology or support services (eg, server space, tech support, website development)

☐ Preservation

☐ Marketing and outreach

☐ Legal services

☐ Financial and accounting services

☐ Other (please describe) _____

_____

_____

☐ Not applicable

18. Is there an annual budget dedicated specifically to the ongoing maintenance or development of this project?

○ Yes (please indicate the approximate amount) _____

○ Yes, but I do not know what it is

○ No, this project is not budgeted for separately

19. How many total staff, in full-time equivalents, are involved with the ongoing maintenance or development of this project?

_____

20. What are all the financial sources of support for the ongoing maintenance or development of this project, whether or not there is a budget dedicated specifically to this project? Check all that apply.

☐ Grants

☐ Base budget from your home institution (direct funding)

☐ Earned income (eg, via sponsorship, advertising, subscriptions, etc.)

☐ Donations or individual philanthropy

☐ Contributions from partner organisations

☐ Other funding sources (please describe) _____

_____

_____

☐ Not applicable

21. **Approximately what percentage of the direct costs for the ongoing maintenance or development of this project is covered by each of these sources? Please enter whole numbers between 0-100. The total should add up to 100.**

Included here was an array of sums with number fields for each of the options selected in Question 20:

(Options selected in Question 20)	Percentage of total direct costs
Grants	
Base budget from your home institution	
Earned income	
Donations or individual philanthropy	
Other funding sources	

22. **What are all the non-financial sources of support for the ongoing maintenance and development of this project, whether or not there is a budget dedicated specifically to this project? Check all that apply.**

☐ In-kind contributions from your home institution

☐ In-kind contributions from partner organisations

☐ Volunteer time from those outside the university

☐ Other non-financial sources (please describe) _____

_____

☐ Not applicable

If respondents did not select "In-kind contributions from your home institution" in Question 22, they skipped ahead to Question 25.

23. **What types of in-kind support does your host institution provide for the ongoing maintenance and development of this project?Check all that apply.**

☐ Project management

☐ Content selection

☐ Content production (eg, scanning, metadata creation)

☐ Information technology or support services (eg, server space, tech support, website development)

☐ Preservation

☐ Marketing and outreach

☐ Legal services

☐ Financial and accounting services

☐ Indirect costs (eg, office space, supplies)

☐ Other (please describe) _____

_____

24. Please briefly describe how in-kind host support contributes to each of these activities (eg, the number of FTEs drawn from your host institution, the nature of the activities undertaken with host support).

Included here was a table with text fields for each of the options selected in Question 23.

(Options selected in Question 23)	UCL helps us by...
Project management	
Content selection	
Content production	

25. What kind of agreement governs the terms of the support that you receive from your host institution?

○ The terms of support have been explicitly discussed and recorded in a document or other written agreement.

○ The terms of support have been discussed but have not been formally recorded.

○ We have not discussed any terms of support.

○ Other (please describe) _____

_____

_____

26. If there is an agreement with your host institution, with whom did you make that agreement? Check all that apply.

☐ Library director

☐ Information services head

☐ Academic department head

☐ Non-departmental academic centre head

☐ Faculty vice-dean

☐ Vice-provost

☐ Dean

☐ Other (please describe) _____

_____

_____

27. How has your host institution's overall level of support for your project changed in the last three years?

	Decreased substantially	Decreased somewhat	Stayed about the same	Increased somewhat	Increased substantially	Not applicable
Overall level of support	○	○	○	○	○	○

28. What additional support, if any, would you like your host institution to provide for your project?

_____

_____

29. Do you have succession plans in place for the project?

○ Yes

○ No

If respondents selected "No" to Question 29, they skipped ahead to Question 31.

30. Please describe these succession plans.

_____

_____

_____

31. Are there any external partnerships involved in the ongoing maintenance, enhancement, or preservation of this project?

○ Yes

○ No

If respondents selected "No" to Question 31, they skipped ahead to Question 33.

32. Please briefly describe these partnerships.

_____

_____

_____

33. Which of the following statements best describes the goal for the ongoing work associated with this project?

○ This project will reach a completion point; all ongoing activities after that point will be dedicated to preserving the resource and providing basic access to it.

○ This project will continue to grow; ongoing activities will expand its content, tools, functionality, and user base, etc in addition to preserving the project.

○ Other (please describe) _____

_____

_____

34. Do you have preservation plans in place for this project?

○ Yes

○ No

If respondents selected "No" to Question 34, they skipped ahead to Question 36.

35. Please describe the preservation plans for this project.

_____

_____

_____

36. Have you ever tried to generate revenue from this project? (eg, through advertising, licensing, or other means)

○ Yes

○ No

If respondents selected "No" to Question 36, they continued to Question 37, then skipped to Question 42.

37. Please briefly describe why you have not tried to generate revenue from this project.

If respondents selected "Yes" to Question 36, they skipped to Question 38.

_____

_____

_____

38. What methods of revenue generation have you tried? Check all that apply.

☐ Licensing or selling content

☐ Advertising or sponsorships

☐ Sale of services related to content

☐ Consulting or advisory work

☐ Other methods (please describe) _____

_____

_____

39. Please briefly describe your experience with these revenue generation methods and the amount (if any) that they generate in an average fiscal year.

Included here was a table with text fields for each of the options selected in Question 38.

(Options selected in Question 38)	Revenue generation details
Licensing or selling content	
Advertising or sponsorships	
Sale of services related to content	

40. Which of the following statements most accurately describes your revenue generation activities?

○ These activities generate enough revenue to cover 100% of the costs of sustaining the project, as well as a surplus that goes toward enhancing the project

○ These activities generate enough revenue to cover 100% of the direct costs of sustaining the project

○ These activities generate between 50-100% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate between 30-50% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate between 10-30% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate 10% or less of the costs of sustaining the project

41. Which of the following statements best describes what you would ideally expect from your revenue generation activities in the future?

○ These activities generate enough revenue to cover 100% of the costs of sustaining the project, as well as a surplus that goes toward enhancing the project

○ These activities generate enough revenue to cover 100% of the direct costs of sustaining the project

○ These activities generate between 50-100% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate between 30-50% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate between 10-30% of the costs of sustaining the project, but we must find additional sources to cover the remainder of our costs

○ These activities generate 10% or less of the costs of sustaining the project

○ Other (please describe)_____

_____

_____

42. Who do you see as the main audiences for this project? Check all that apply.

☐ Researchers or other scholars

☐ Post-secondary instructors

☐ Primary or secondary instructors

☐ Students

☐ Specialist amateurs or subject enthusiasts

☐ General public

☐ Other (please describe) _____

_____

_____

43. What measures do you use to evaluate the impact of this project? Check all that apply.

☐ Overall total usage (eg, page views of downloads)

☐ Total audience reached (eg, number of unique users)

☐ Usage in teaching (eg, number of students affected)

☐ Usage in research (eg, citations or references in published work)

☐ REF assessment

☐ Social impact beyond academia

☐ Other (please describe) _____

_____

_____

☐ We do not evaluate the impact of this project.

If respondents selected "We do not evaluate the impact of this project" in Question 43, they skipped to Question 47.

44. For each measure you indicated, please report on the most current figures for your project.

Included here was a table with number fields for each of the options selected in Question 43:

(Options selected in Question 43)	Impact measure figures
Overall total usage (eg, page views or downloads)	
Total audience reached (eg, number of unique users)	
Usage in teaching (eg, number of students affected)	

45. How have these measures of impact changed over the past three years? Select one box per row.

Included here was a table with radio buttons for each of the options selected in Question 43:

(Options selected in Question 43)	Decreased substantially	Decreased somewhat	Stayed about the same	Increased somewhat	Increased substantially	Not applicable
Overall total usage (eg, page views or downloads)						
Total audience reached (eg, number of unique users)						
Usage in teaching (eg, number of students affected)						

46. Are there any other indicators of the success of this project? (eg, awards, media coverage, usage in prominent contexts)

_____

_____

_____

_____

_____

_____

47. Looking forward, how concerned are you about finding or maintaining sources of support for this project? Using a scale from 1 to 5, where 1 is "not at all concerned" and 5 is "extremely concerned", select one number.

	1 — not at all concerned	2	3	4	5 — extremely concerned
Level of concern	○	○	○	○	○

48. Please briefly describe the most significant sustainability risks or challenges facing this project.

_____

_____

_____

_____

_____

_____

49. May we contact you to follow up with any additional questions?

○ Yes

○ No

You have reached the end of the survey. Thank you for your participation! Your input is invaluable in forming a picture of the activity at UCL. We anticipate that the results will help both project leaders and university administrators and management to develop valuable, sustainable digital projects. When you click to the next page, you will exit the survey and be redirected to our website. If you would like to edit your answers before submitting them, you may click the back button below and edit them now.

If you have any questions or comments, please feel free to email the study's lead author, Nancy Maron, at **nancy.maron@ithaka.org**.

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Sustainability Health Check Tool for Digital Content Projects

This is for:

- **Digital project leaders** who want to review the ongoing needs of their projects
- **Library, museum and university administrators** who want to "take the pulse" of the many digital projects for which they are responsible

While the activities required to get digital content projects up and running are generally well documented, those needed to support projects as they mature may be less obvious and are not always discussed once the project has been launched.

This Health Check Tool provides an opportunity for you to think about the kinds of resources — money, staff and otherwise — that are being dedicated to your institution's digital content projects on an ongoing basis. This will enable you to take a fresh look at whether a project is delivering the desired impact in the communities you aim to serve and to consider new ways to enhance the value of your content for your users.

Description of the project

1. **Name of project:** _____

2. **When did this project first become available to users online?** _____

3. **I consider this project to be... (select one of the following)**
    In answering this question, consider the ideal post-grant scenario for your resource. If funding/ capacity were no issue, what model would deliver the greatest impact?

☐   **A "pure maintenance" project.** It just requires some basic support to ensure that formats are up to date and usable. These projects can live with minimal updates as long as they are preserved; ongoing work to add content, enhance access, or update technology infrastructures is unnecessary (whether undertaken by the project itself or by the platform or institution on which it is hosted).

☐   **An "ongoing preservation" project.** These projects require ongoing activities to ensure that platforms are up-to-date and content is findable; these activities can be done either at an individual project level, or performed at a platform or institution-wide level (eg, repositories that are highly used and findable).

☐   **A "growth" project.** This type of project requires specific ongoing maintenance, and shows signs of user uptake that we want to encourage. This is, or has the potential to become, a highly valuable, widely used resource.

4. **Describe the sort of impact you want the project to have.**
    By "impact," we mean the ultimate goal of the resource. The actual impact of a resource may shift over time – a resource that begins as a research resource may morph into a teaching tool. Think about your current aspirations for the resource. Consider the audiences that you seek to influence and how you would like to influence them.

    _____

    _____

5. **Who currently manages this collection?**
   There may or may not be one person with primary responsibility for the success of this resource and the person who is running it now may not be the same person who created it.

   _____

   _____

6. **What department manages this collection?**
   It may be managed by an IT group, a collections team, or an academic department. Bear in mind that other departments might also play a role in supporting this work.

   _____

   _____

7. **Does this project have any external partners involved in its management? If so, what is the nature of the partnership (eg, is your content hosted externally; do you host your content but partner with others for access to resources such as equipment)?**
   Think about any collaborations with bodies outside of the home institution that may assist with content, technical support, marketing, etc.

   _____

   _____

8. **If external partners or funders help to support this project, what agreements govern this relationship? When do the terms next come up for review?**
   Consider both implicit and explicit agreements that might include financial requirements, preservation plans, etc.

   _____

   _____

Ongoing Support

Even if the digital project you are reviewing does not have its own budget line, there are certainly activities and costs associated with its maintenance and enhancement aimed at keeping the project current and valuable to users. The questions below will help you to think about what these ongoing activities are and what resources are required to carry them out.

9. **How many total staff, in full-time equivalents (FTEs), are involved with the ongoing maintenance or development of this project?**
   Take into account all staff associated with the project in FTEs, whether they are paid through the resource's budget funding or not.

   _____

   _____

10. **Other than staff, what are other costs associated with the ongoing support of this project?**
    Think about all indirect costs, such as office space, overhead, etc, if possible.

    _____

    _____

11. How are the costs for this project currently funded? (List source and amounts for each category.) Do you expect this to change in the next year, and if so, how?

☐ Grants _____

☐ Contributions from partner organisations _____

☐ Base budget from your institution (direct funding) _____

☐ In-kind support (please describe) _____

☐ Other funding sources (please describe) _____

☐ Earned income (eg via sponsorship, advertising, subscriptions, etc) _____

☐ Donations or individual philanthropy _____

12. What activities are involved in the current ongoing maintenance or enhancement of the resource? If more resources could be allocated, what activities would be most valuable in increasing your project's impact? Think about the roles these activities have or would have in the project.

	Current ongoing activities	Ongoing activities next year
Project management		
Marketing and outreach		
Content selection		
Legal services		
Content production (eg scanning, metadata creation)		
Financial and accounting services		
Information technology and support services (eg server space, tech support, upgrades, etc)		
Indirect costs (eg office space, supplies)		
Digital preservation		
Other (please describe)		

13. When was the content of the resource most recently updated?
This includes adding, deleting, or editing content or any material directly related to content (eg metadata).

_____

_____

14. When was the user interface of the resource most recently updated?
Consider any visual or organisational changes that may affect how users see or interact with your resource.

_____

_____

Preservation standards checklist

Preservation is often the first concern of managers seeking to ensure the future of their resources. The following checklist outlines specific steps based on preservation "best practices" for resources that require specific preservation activities. This is by no means a comprehensive list of the steps required for a comprehensive preservation strategy; think of it as an introduction to potential preservation activities for your resource.

> For additional guidance on preservation activities and best practices, consult materials published by the non-profit Digital Preservation Coalition: **www.dpconline.org/advice/ preservationhandbook**.

15. Which of the following preservation activities do you conduct or plan to conduct on a regular basis?

☐ Generate and manage descriptive, structural, event, and preservation metadata.

☐ Back up all master and derivative versions of the objects and metadata.

☐ Document which parties are responsible for maintaining the intellectual content and which parties are responsible for maintaining the technical integrity of the collection.

☐ Define supported preservation formats and document which files in your preservation platform are supported and which are not.

☐ Regularly check the files for corruption (eg by use of a checksum).

☐ Other:_____

_____

_____

_____

_____

Audience, usage, and impact

Who and how many do you hope will use this digital content, and how will you reach them? Understanding who your users are and what they want and need from your project helps you to evaluate the way resources are allocated to support that project. This will help you to make informed decisions and, if needed, changes that can assist you in assessing and achieving the impact you're aiming for. The following questions are intended to encourage you to articulate the audiences for which this resource is maintained and evaluate current tactics for outreach.

16. Who do you see as the main audience(s) for this project?
While resources may aspire to reach all audiences, think about only the most likely or most relevant groups. Potential audiences could include researchers in specific disciplines, students, or subject enthusiasts. Be as specific as possible.

> The SCA-funded Guide to Research Audiences provides a comprehensive overview of the basic principles of audience research: **http://sca.jiscinvolve.org/wp/portfolio-items/the-guide-to-researching-audiences**

_____

_____

_____

_____

_____

17. What metrics do you use to measure and evaluate the impact of this project? How have these metrics and measurements changed since last year? Use the most current figures for your project, and separate them by audience, if possible.
Consider only those metrics that you use to measure and evaluate your impact. If there are exceptional factors that have affected these metrics, you may want to take those into account as you think about these changes.

> For further assistance, see the Oxford Internet Institute's Toolkit for the Impact of Digitised Scholarly Resources (2009), which presents a framework and set of best practices to measure usage and impact for digital scholarly resources: **http://microsites.oii.ox.ac.uk/tidsr/welcome** and Simon Tanner's Balanced Value Impact Model: **www.kdcs.kcl.ac.uk/innovation/impact.html**

_____

_____

_____

_____

_____

_____

_____

	Current metrics	Change since last year	Goal for next year
Number of content accesses (eg page views, downloads)			
Total audience reached (eg number of unique visitors)			
Usage in teaching (eg number of students reached)			
User loyalty (eg return visits, frequency of visits over time)			
User engagement (eg time on site, returning users)			
Referrals			
Usage in research (eg citations or references in published work)			
Awards			
Media coverage			
Citations/usage in prominent contexts			
Other (please describe)			

Given your responses to the items above, which statement below best characterises the current level of investment and support for this project?

☐ 5 — adequate for performing all of the activities needed to increase the value of this resource and achieve greater impact

☐ 4 — adequate for performing the majority of the activities needed to achieve greater impact

☐ 3 — adequate for performing some of the activities needed to achieve greater impact

☐ 2 — adequate for performing only the most critical maintenance, preservation and other activities to maintain the project's value

☐ 1 — not adequate for performing any of the maintenance, preservation and other activities needed to maintain the project's value

Your action plan

Based on the current status of your project, and the sustainability and impact needs of your project, evaluate your success in each of the categories below by rating each element from 1-10. In the rows below, please outline goals for the next year in each of these categories, and specific action steps needed to achieve these goals.

	Activities for sustainability: dashboard						
	Currency of content	User interface	Tech infra-structure	Audience	Other impact measure(s)	Preservation	Financial stability
Rating							
Goal for next year							
Action Needed							

Next steps and timeline

Who will you need to work with to take these steps?

_____

_____

_____

_____

_____

When will you review progress again?

_____

_____

_____

_____

_____

Framing the Case for Host Support: Action steps and questions for digital project leaders

Leaders of digital resource projects, even quite successful ones, may face difficulty in developing reliable sustainability plans that cover all their ongoing costs for maintenance and enhancement. One source of potential support is the host institution, whether that is a university, library, or museum. But gaining host support, whether in the form of ongoing funding, staff time, or other in-kind contributions, is not automatic. Rather, this is often the result of careful planning and some advocacy on the part of project leaders and seems to happen most often when the institution has a real stake in the project at hand.

The following briefing guide offers questions to help project leaders consider future project needs and frame the value of their work when seeking support from their host institution.

1. What will you need in the future?

What will your project require in order to continue to deliver value after the end of the grant period?

Most project leaders do an excellent job of envisioning the work needed during the grant period, but considering what is needed to sustain the project's impact post-grant is just as important:

- What impact do you want your project to have?

- What ongoing development or activities will be necessary post-grant in order for that to happen? Adding new content? Upgrading hardware or software? Promotion and outreach? Project management?

- Which activities can be best done by others, such as a library partner? Which activities must you do, or at least fund, yourself?

Whether projects remain independent endeavours or embed themselves in larger platforms or infrastructures, most will need to think about how to undertake activities to ensure consistent access and impact. Simply developing a plan for basic storage is not enough, in many cases, to ensure adequate access and impact. Thinking through these questions beforehand will allow you to develop a strategy for sustainability and value. For additional detail on developing a post-grant strategy, please see Ithaka S+R's *A Framework for Post-Grant Sustainability Planning* (July 2011) **http://sca.jiscinvolve.org/wp/files/2012/02/framework-slide-5-09.pdf**

2. What are your succession plans?

Have you considered what will become of your digital resource should you move on?

Many project leaders demonstrate deep devotion to their work, but few have considered what will become of the project they have created should they choose to move on. Past research indicates that having a "champion" for a project is one of the most important points in developing a sustainable project. Thinking about exit plans, documentation of key processes and building in associates or partners who can take on the work is an important part of a long-term sustainability plan for any major digital resource.

- Establish a clear succession plan for ongoing management of the resource. Who will run the project, if not you? Will the resource be deposited with the library or IT department? Does documentation exist outlining standards and practices?

3. Who are possible partners within your institution?

Ideally, you have been working with either the library, the IT department or another campus-based partner from the start, so that costs and standard formats have already been built into the plans for your project. If this is not the case, it is time to determine who these partners might be and how you might work with them.

Questions to consider when approaching potential partners include:

- What support will the partner provide: Storage? Preservation? Curation? Marketing and outreach?

- What value will the partner derive from this partnership?

- How will the partner be credited for this arrangement?

- Over what time period will this support be required? What plans are in place beyond that time?

4. How does your project align with institutional priorities or solutions?

Does your project present some unique value to your institution? Why is your institution uniquely suited to support your resource?

Library and university administrators we have spoken to report that they are more likely to agree to take on projects that they did not initiate themselves, if (1) the projects have strong alignment with their own institutional mission, and (2) the projects have been created in ways that are technically compatible with the systems they have in place.

Questions to ask when studying institutional priorities:

- Are there specific areas of expertise or subjects of interest within the support units or departments at your institution? UCL has a particularly strong historical relationship with Jeremy Bentham, for example; its Centre for Digital Humanities has particular expertise in social media.

- Are there any current institutional initiatives for supporting digital content?

- How will you identify these subjects? You may find it helpful to speak directly with institutional management, academic administrators, library directors, or IT leaders (among others) to explicitly identify these areas.

- If these priority topics or initiatives exist, how will your project fit into those structures or advance those topics?

5. Making the case: why should your host institution help to sustain your resource?

A common assumption is that one's host institution will willingly take on support of digital projects but this is not always the case. In order to draw host support, whether from a library, centre, or other campus-based unit, you must present some type of value to the institution. Ideally, this bond has been forged in the early days of your project. If not, it will be even more important to take into consideration the value your project offers, whether because of a substantial or highly enthusiastic audience of users, demonstrable importance in research or teaching, or close alignment with the history or mission of the institution. Ideally, supporting a project that has demonstrated value will reflect well on the institution that sustains it and badly if they do not.

You should be able to speak clearly and decisively about the impact of your resource. Considering basic questions about audience and usage and impact will help you to structure an argument for why your host institution should support your resource. The person you should approach with your case for support will vary by institution, but we anticipate that this may be a provost or dean of research, or a head of a support unit (eg the library, the museum).

a. Who are the people using your resource? Do you have figures on the size of these audiences?

b. How are they currently using your resource?

c. Are there any other indications that the broader community is noticing your resource?

d. What other positive impact does your host institution derive from supporting or being associated with your resource? Conversely, will your host institution be viewed poorly for allowing your resource to expire or move elsewhere?

e. What is the unique value of your project? What needs does it satisfy that other resources may not?

f. How with the community respond if your resource is discontinued?

At the same time, you should be clear about the support and terms that you will expect from the institution.

a. What activities and costs do you specifically require? What will these be used for?

b. What costs will be borne by the project itself?

c. What other measures are you taking to minimise the ongoing costs and needs of the resource?

d. Will there be any possibilities for revenue generation in the future?

e. Over what period will you require support? Explicit signed agreements for defined periods of time appear to be relatively rare and you may have to agree to less stable implicit agreements for support.

Additional references:

The prompting questions above are intended to help project leaders think about post-grant sustainability and maximise the likelihood of receiving host support. However, in order to present a strong case for host support, projects must first be valuable and impactful — they must be projects worth supporting. While this briefing guide will not delve into those details, you may find it helpful to consult these Jisc-commissioned works for guidelines on how to maximise the impact of digital resources:

Chatterton, Peter. *Sustaining and Embedding Innovations: A Good Practice Guide*. (London: Jisc, October 2010). **http://jiscdesignstudio.pbworks.com/w/page/40439212/Sustaining%20and%20 Embedding%20Innovations%20Good%20Practice%20Guide**

Maron, Nancy L. *A Framework for Post-Grant Sustainability Planning*. (London: Jisc, July 2011). **http://sca.jiscinvolve.org/wp/2011/07/26/a-framework-for-post-grant-sustainability-planning**

Maron, Nancy L., Kirby Smith, K. and Loy, Matthew. *Sustaining Digital Resources: An On-the-Ground View of Projects Today.* (NY: Ithaka S+R, Nov 2009). **www.sr.ithaka.org/research-publications/ sustaining-digital-projects-ground-view-projects-today**

Maron, Nancy L., and Loy, Matthew. *Revenue, Recession, Reliance: Revisiting the SCA/Ithaka S+R Case Studies in Sustainability*. (NY: Ithaka S+R, Oct 2011). **www.sr.ithaka.org/research-publications/ revenue-recession-reliance-revisiting-scaithaka-sr-case-studies-sustainability**

Jisc Netskills. "Maximising online resource effectiveness". (London: Jisc, April 2011) **http://sca. jiscinvolve.org/wp/allpublications/maximising-online-resource-effectiveness/**

Quirk, Rachel, et al. *The Guide to Researching Audiences*. (London: Jisc, Dec 2009) **http://sca. jiscinvolve.org/wp/portfolio-items/the-guide-to-researching-audiences**

Tanner, Simon. *Measuring the Impact of Digital Resources: The Balanced Value Impact Model*. (London: KCL, 2012) **www.kdcs.kcl.ac.uk/fileadmin/documents/pubs/BalancedValueImpactModel_ SimonTanner_October2012.pdf**

Oxford Internet Institute. Toolkit for the Impact of Digitised Scholarly Resources (TIDSR). (Oxford: Oxford Internet Institute, 2008) **http://microsites.oii.ox.ac.uk/tidsr/welcome**

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Sustaining Our Digital Future:

Institutional Strategies for Digital Content

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