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Opening Access to Collections: the Making and Using of Open Digitised Cultural Content

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Structured Abstract

Purpose. This paper situates the activity of digitisation to increase access to cultural and heritage content alongside the objectives of the Open Access movement. It demonstrates that increasingly open licensing of digital cultural heritage content is creating opportunities for researchers in the arts and humanities for both access to and analysis of cultural heritage materials.

Design/methodology/approach. The paper is primarily a literature and scoping review of the current digitisation licensing climate, using and embedding examples from ongoing research projects and recent writings on open access and digitisation to highlight both opportunities and barriers to the creation and use of digital heritage content from Galleries, Libraries, Archives and Museums.

Findings. The digital information environment in which digitised content is created and delivered has changed phenomenally, allowing the sharing and reuse of digital data and encouraging new advances in research across the sector, although issues of licensing persist. There remain further opportunities for understanding how to: study use and users of openly available cultural and heritage content; disseminate and encourage the uptake of open cultural content; persuade other institutions to publish their content in an open and accessible manner; build aggregation and search facilities to link across information sources to allow resource discovery; and how best to use high performance computing facilities to analyse and process the large amounts of content we are now seeing being made available throughout the sector.

Research limitations/implications (if applicable). It is hoped that by pulling together this discussion, the benefits to making material openly available have been made clear, encouraging others in the GLAM sector to consider making their collections openly available for reuse and repurposing via publishing with open

licenses.

Practical implications (if applicable). This paper will encourage others in the GLAM sector to consider licensing their collections in an open and reusable fashion. By spelling out the range of opportunities for researchers in using open cultural and heritage materials it makes a contribution to the discussion in this area.

Social implications (if applicable). Increasing the quantity of high quality open access resources in the cultural heritage sector will lead to a richer research environment which will increase our understanding of history, culture, and society.

Originality/value. This paper has pulled together, for the first time, an overview of the current state of affairs of digitisation in the cultural and heritage sector seen through the context of the Open Access movement. It has highlighted opportunities for researchers in the arts, humanities and social and historical sciences in the embedding of open cultural data into both their research and teaching, whilst scoping the wave of cultural heritage content which is being created from institutional repositories which are now available for research and use. As such, it is a position paper that encourages the open data agenda within the cultural and heritage sector, showing the potentials that exists for the study of culture and society when data is made open.

Introduction

Open Access – the provision of unrestricted access to peer-reviewed scholarly research – is often accompanied by calls for Open Research, Open Data, and Open Science: research conducted in a spirit of making available its methods, data, and results so that others can replicate, investigate, corroborate, and ultimately contribute to answering the underlying research questions. Many projects produced within the sciences can choose to make their datasets, which they have often gathered and created themselves, available (although licensing constraints sometime apply).

However, those producing research material within the arts, humanities, culture and heritage depend, for the most part, on access to primary historical sources which often belong to and in memory institutions such as Galleries, Libraries, Archives, and Museums, or reside in private collections. While digitisation is not a pre-requisite to gaining access to material (which can be viewed in its original, analogue form), and while digital surrogates of cultural heritage objects do not have to be openly shared

once created, just as the sciences are calling for publication of source data as part of the Open Access movement, opening up access to primary sources in the cultural heritage sector and encouraging them to be published in a way which is as accessible as possible has the potential to change the nature of research outputs in the Humanities and Social Sciences, as well as the nature of research itself in these areas. This paper investigates the relationship between the Open Access movement and current debates regarding the licensing and availability of digitised cultural heritage content, indicating that the growing voice of the Open Access community is influencing policy within organisations and making digitised cultural heritage content more accessible. This encourages its publication, reuse and integration into research outputs, which results in a virtuous circle of encouraging use and access of digitised primary historical source content. The ramifications for the sector are clear: the Open Access movement is both dependent on and encouraging to the open licensing of digital primary historical material, which in turn offers up further opportunities for research in the arts, humanities, and cultural heritage. However, not all heritage content is digitised, and not all digitised content can be made openly available due to copyright restrictions and legal frameworks which do not easily support the distribution and reuse of cultural heritage collections. This paper scopes out the current state of play of digitisation, whilst highlighting opportunities for researchers and teachers in the arts, humanities and social sciences, laying out a persuasive argument as the benefits of open cultural content for the academic sector.

The digitally locked door: accessing digitised heritage content

“the conversion of an analog signal or code into a digital signal or code” (Lee 2002, 3), is now a commonplace activity across the heritage sector, as digital representations of cultural and heritage artefacts are created, usually for dissemination online, encouraging remote viewing and usage by online visitors (Terras 2015). What is the relationship to the Open Access movement and the digitisation of cultural heritage material? Making digitised content from Galleries, Libraries, Archives and Museums openly available for reuse is not a prerequisite of the process, but we are now seeing benefits from both users and institutions when digitised content is made available for reuse with a clear licensing structure or declaration, and many more institutions beginning to make their collections available in this manner:

developments in the Open Access movement have clearly informed and influenced those in the business of digitisation.

To understand why this movement is happening, it is first useful to consider how those in the university and cultural heritage sector have been able to use to cultural and heritage content that is *not* openly licensed. The early days of digitisation saw projects which were unable to make use of materials, or unable to circulate their resulting outputs, because the primary historical resources they so depended on did not belong to them, the digitised copied had not been given a license that permitted reuse or it had not been placed in the public domain (where intellectual property rights have expired or been forfeited), or the licensing agreements arranged were so complex as to be unworkable. It is possible to digitise cultural heritage materials such as photographs, manuscripts, and artworks, and not actually make them any more accessible than they were previously.

In 1992, the UK Government announced an ambitious “Teaching and Learning Technology Programme” (TLTP) jointly funded by the four higher education funding bodies. The aim of this programme was to allocate a total of £75m to improve the quality of teaching and learning across the university sector at a time of rapid expansion for digital technologies (Haywood *et al* 1999). A large and diverse student population was demanding high quality teaching and learning, and given the changing information environment it was inevitable that technology had a role to play in the future delivery of university materials (NAEC, 2015). Seventy-six projects were launched, including the TLTP History Courseware Consortium (HCC, 2000), comprising of eighty UK higher education institutions who were tasked in providing online tutorials and readings in various aspects of history, embedding digitised primary sources into the online texts (Wissenburg, 1996). The HCC produced a wide range of lengthy online tutorials on a variety of topics, covering emergent areas where primary sources were not well covered in textbooks, such as “Women’s History: Major Themes in Women's History from the Enlightenment to the Second World War” and “Enfranchising Women: The Politics of women's Suffrage in Europe 1789 – 1945”¹. Written by many different academic experts, each overview tutorial provided enough material for an undergraduate module course, broken down into a

¹<http://web.archive.org/web/20030902022335/http://www2.gla.ac.uk/~histltp/BROCHURE/women2.htm#Title>

range of subsections which were equivalent to a lecture on each topic, with hundreds of digitised primary historical sources weaved throughout, bringing together many disparate digitised sources via digital publishing, for the first time. In particular, the use of digital video materials was ambitious, years before there was any online infrastructure to help host and deliver this type of media.

One of the headaches of the HCC tutorials was the necessary rights clearance for the reuse of the primary historical sources embedded throughout these ambitious and overarching digital tutorials. Permissions were pursued for each and every item featured: in the tutorial on women's history, over two hundred items had to have individual copyright clearance arrangements from over sixty-six different collections, trusts, presses, councils and publishers (HCC, N.D.). For many of the institutions, this was the first time that they had dealt with digitisation, or electronic publishing, and untold wealth and potential institutional liabilities lay ahead in considering that digital versions of their holdings may be used elsewhere, away from their control. Given that there was no standard digital license that could be suggested, and that electronic publishing was so new, with little legal framework to support them at the time, the license for each and every item had to be carefully negotiated. The overall licensing agreements and restrictions were so stringent and restrictive that, after all this work, the tutorials could not be put online and were only sold on licensed CD-Roms to university departments². As a result, all that remains of the HCC tutorials today are "tasters" that remain on the Internet Archive³ which don't cover the breadth, range, and standard of the work produced. The effort that went into producing these materials was never appreciated, nor the bravery in pushing forward the use of digital content, including integrating digitised sources and (in particular) digital video into the tutorials. However, the activity contributed greatly to both raising awareness of the possibilities that computing could bring to history, the usefulness of digitised content, and establishing humanities computing as a useful endeavour in arts and humanities departments across the UK (Hitchcock, 2008). The aim to weave in digital

² The HCC was led by the University of Glasgow under the leadership of Dr Donald Spaeth. In April 1998 I was employed to work on the project in the final stages, helping proof read the tutorials before the CD-Roms were produced, which was my first paid job in what was then called "Humanities Computing".

³<http://web.archive.org/web/20030902022118/http://www.gla.ac.uk/~histltp/BROCHURE/themes.htm#Title>

primary historical sources, from a range of sources, into academic materials was laudible: however, the mechanisms for delivery, and the legal framework which restricted their open use, replication, and distribution, hobbled this ground breaking work from becoming accessible and available beyond the project's funded period. Given their early and ambitious stance, there was simply no understanding within the sector as to how and why to best make primary historical digitised sources available for others in the digital sphere.

e still hear the same rhetoric of accessibility surrounding digitisation, without considering the legal and licensing, or financial, frameworks which hamper increased access, and use. Literature on digitisation promotes that, once created, digital surrogates of primary historical documents and artefacts will be able to be enjoyed by an “unlimited audience” (Keene 1998, p. 11) which will allow individuals to enjoy replicas of artefacts and museum environments from a distance and to avoid the spatial and temporal limitations of an actual visit to a museum. In turn, the increased accessibility of cultural contents would underpin a process of democratization of culture which openly resonated with the main proposals of the New Museology thinking of the 1970s and 1980s (Sartori 2015) although there is seldom consideration to licensing issues within these sweeping statements. Reasons commonly given for undertaking digitisation within a cultural heritage environment include

While there can be no doubt that digitisation has massively increased the volume of cultural content available online (Crane 2006), the accompanying excitement has led to hyperbolic assessments of both the range of material available, how accessible the material actually is, and how it will change scholarship (Gooding *et al* 2013). Although expectations have been raised that *all* content is now online, an EU survey of 2000 Galleries, Libraries, Archives, and Museums from 29 different countries indicated that National Libraries had, in 2012, only 4% of their historical content available in digitised formats

Digitisation remains a costly and time-consuming activity, and projects are expensive to undertake, and sustain (Denbo *et al* 2008). Unresolved issues surrounding the copyright and licensing of resulting digitised content from historical collections remains a core reason why digitisation should not take place (Hughes 2004, p. 50). The technology environment in which we spend most of our time is rapidly changing, but many cultural and heritage organisations are “

How does the act of digitising cultural and heritage content relate to the Open Access agenda and movement, which is primarily concerned with the open publication of research emanating from academic activity? Many of the concerns held by academics, libraries, and publishers regarding “unrestricted access and unrestricted reuse” (PLOS, N.D) to academic articles are also concerns held by those producing and requiring access to digitised cultural and heritage content. Proposed open and unfettered access to digital primary historical sources for others to reuse within a research context in the arts, humanities, and social and historical sciences can be seen as akin to the Open Publishing arm of the Open Access movement (Arnison 2001), which has much to offer those wishing to access digitised primary historical artefacts given the belief that “Open data and content can be freely used, modified, and shared by anyone for any purpose” (Open Definition, N. D.). The open publication of digital images of documents, photographs, maps, etc can lead to their inclusion in research (and their resulting publication in research outputs) and will eventually lead to no more hobbling of projects in this area, such as the limited distribution mechanisms possible for the HCC history tutorials. Of course, aside from academia, opening up access to digitised cultural and heritage content also offers many opportunities to the cultural and creative industries (EC 2014).

We are at an early stage, though, of collections allowing Open Access to their materials, and those discussions are informed and led by similar discussions happening within the Open Access community, as the mechanisms for cost recovery, maintenance and sustainability are explored, and institutional philosophies regarding how to approach and perceive digital versions of primary source materials held in institutional environments are gradually changing. Coordinated efforts to promote Open Access and re-use of digitised material are happening across the cultural and heritage sector, including “funding frameworks, pilot digitisation consortia, metadata aggregators, web archiving projects and dedicated platforms” (EC 2014, p. 24). The European Commission has recently called on Member States “to promote unhindered usability of digitised public domain⁴ material” (EC 2014, p. 28) and to “improve the

⁴ Public Domain material is content which is not subject to copyright or other legal restrictions and belongs to or is available to the public without restrictions. Intellectual property rights may have

conditions for bringing in-copyright content online” (ibid, p. 29). We now look at those pushing forward the open access agenda with Galleries, Libraries, Archives and Museums: the OpenGlam movement, and particular institutions that have pushed ahead with making their cultural heritage content as open as possible.

Open Collections: The OpenGlam movement

OpenGlam (<http://openglam.org>) is an European Commission funded initiative coordinated by the Open Knowledge Foundation (<https://okfn.org/>) “that is committed to building a global cultural commons for everyone to use, access and enjoy” (OpenGlam (N.D.a)). Their aim is to help cultural institutions open up their content and data, following the Open Definition (as provided above, to be “freely used, modified, and shared by anyone for any purpose”), allowing unrestricted access to content. They see the main advantages of this approach as giving institutions:

Greater public awareness of their collections via popular open content portals such as Wikimedia Commons and the Internet Archive; Increased discoverability of their holdings through portals like Europeana and Google; Improved opportunities for their audiences to participate in the curation and enrichment of their collections (ibid).

In addition, they understand

the importance of knowledge sharing for research, innovation and creativity. For instance: More openly licensed cultural content enables teachers across the world to re-use this work in the classroom; More open cultural data enables researchers to draw links between between people, things and events through the use of innovative techniques such as text mining and visualisation; More open cultural content enables citizens from across the world to enjoy this material, understand their cultural heritage and re-use this material to produce new works of art (ibid).

The language used – open definition, open data, open content, open publishing, - indicates that OpenGlam is firmly aware of discussions of such activities in the scholarly Open Access movement, seeing the improvement in access to digitised cultural and heritage content as an extension of the activities taking place regarding access to scholarly research and academic outputs, and embedding the rhetoric

expired, may never have been applicable, or may have been forfeited by their original owner. See Boyle (2010) for an overview of the term and how it is applied.

surrounding digitisation with a concrete framework to establish what is meant by “access” in this context.

OpenGlam undertakes a range of activities to help cultural institutions open up their collections, including workshops, position papers, the provision of documentation surrounding licensing and formats which are particularly geared to the cultural and heritage sector, and the creation and support of online and offline forums for professionals to discuss experiences and potentials in opening up collections. In addition, OpenGlam operates a volunteer-led working group who evangelises around their principles, which encourage the releasing of digital information about artefacts (metadata), the keeping of digital representations of works for which copyright has expired in the public domain, the publishing of robust statements regarding reuse and repurposing of both the whole data collection and subsets of the collection, the publishing of machine readable open file formats, and the engagement of audiences in novel ways on the web (OpenGlam, N. D. (b)). Concrete instantiations of these principles include the online journal *The Public Domain Review* (<http://publicdomainreview.org/>) which features public domain material presented in collections, essays, curated examples, and remixes; the international annual conference “Sharing is Caring” which will be held for the fifth time in 2015; and an active social media presence, promoting OpenGlam activities around Europe including pop-up exhibitions, open culture hackathons, technical workshops, open collections, and both new and ongoing projects in this space. There is no doubt that the OpenGlam community, with their “evangelism” (ibid) for this area, are increasing the understanding of how important making cultural and heritage content open is for a wide audience of users, including academia and industry. This initiative sits alongside other groups and organisations promoting open access of cultural heritage content including Open Cultuur Data in the Netherlands (<http://www.opencultuurdata.nl/>) and the Digital Public Library of America (<http://dp.la/>): together their work is ensuring that the benefits and potential for making content publicly available is understood, encouraging other institutions to embrace open thinking too.

Collections Made Open

A pioneer in making their cultural heritage collection open is the Rijksmuseum in Amsterdam (<https://www.rijksmuseum.nl/>), a national museum of the Netherlands containing a wealth of internationally important artworks and historical objects. In 2011 the Rijksmuseum began to consider releasing some of their images online. The Open Cultuur Data Initiative (<http://www.opencultuurdata.nl/>) had approached them to ask if they could make some images available for an Apps4Amsterdam competition, prompting a survey of the availability of images of their art works, which discovered that there were over 10,000 low-quality copies of “The Milkmaid”, one of Johannes Vermeer’s most famous paintings, circulating online without the Rijksmuseum permission, many with poor, yellowish reproductions:

people simply didn’t believe the postcards in our museum shop were showing the original painting. This was the trigger for us to put high-resolution images of the original work with open metadata on the web ourselves. Opening up our data is our best defence against the ‘yellow Milkmaid’ (Verwayen *et al* 2011).

It was at that stage that the Rijksmuseum decided that high quality scans of their most famous works should be made accessible

in order to promote the collection of the museum to a wider audience. They continued working on clearing the rights and to get the descriptive information right. This has now resulted in 111.000 digital images of artworks that are in the public domain that they can offer without any copyright restrictions. The images are made available as a download, but also via an API... At the end of 2012, this was accompanied with the launch of the Rijksstudio (<https://www.rijksmuseum.nl/en/rijksstudio>) where people can more easily get access to the material and create their own exhibition. It is encouraged to take and reuse the images in any way possible and to share the results with the Rijksmuseum (OpenGlam 2013).

At the time of writing, there are now over 208,000 high quality images for free download, sharing, remixing and reuse available on the Rijksstudio website. The museum retains the high resolution, print quality images, which it sells for a small fee, reporting that traffic to the website, and time spent by each individual user, has increased greatly, without seeing a fall in revenues for its image licensing.

In addition, more than 30 new applications based on the Rijksmuseum dataset have been developed by commercial firms (Sanderhoff 2014, p. 78). Additionally, the museum now has quality control over the images of its art collections available online, providing colour-managed digital reproductions and avoiding the Yellow Milkmaid Syndrome (<http://yellowmilkmaidsyndrome.tumblr.com/>) which plagues other online images of artworks shared without institutional permission.

The Rijksmuseum's efforts in this area are the poster child for Open Access to digitised content given that they were the first to have a very public launch, and have consistently driven forward the message that they believe that the open agenda for digital cultural heritage is the path all should be pursuing, with considerable success along the way. Since 2011 there have been other institutions following the Rijksmuseum's lead, including; in March 2013 the Los Angeles County Museum made 20,000 art images available for free download (<http://collections.lacma.org/>); in August 2013 The Getty's Open Content Program was launched, which now includes more than 99,000 Open Content images from the J. Paul Getty Museum and the Getty Research Institute (<http://search.getty.edu/gateway/>); The British Library put 1,000,000 images from its out of copyright digitised books into the public domain in December 2013 (<https://www.flickr.com/photos/britishlibrary/>); The Wellcome Library made 100,000 images from the History of Medicine freely available from January 2014 (<http://wellcomeimages.org/>); and The National Gallery of Art, Washington, which since April 2014 has made 45,000 high resolution images of works of art freely available under an open access licence (https://images.nga.gov/en/page/show_home_page.html). Other galleries, libraries, and museums are following, including the Statens Museum for Kunst (National Gallery of Denmark) who have placed 25,000 images in the public domain (<http://www.smk.dk/en/use-of-images-and-text/free-download-of-artworks/>), the Yale Art Gallery (<http://artgallery.yale.edu/collection/>) who have placed 250,000 images in the public domain, We have concentrated on images of art works here, but similar actions are happening with other out of copyright and public domain materials, too: over eight million public domain books are available at the Internet Archive (<https://archive.org/details/texts>); in 2015 25,000 transcriptions of Early English Books Online (EEBO) texts were placed into the public domain. (Mueller 2014). The

list of institutions making their collections open continues to grow (a list of those contributing items to the public domain or providing items with a reusable license is maintained at <http://openglam.org/open-collections/>), and putting these collections online is this matter is often accompanied by a raft of publicity for the organisation (there are studies that remain to be done regarding long term benefits to reputational impact of such approaches: as we shall see below, the financial models are becoming clearer).

Institution/Collection	Type of Open Content	Quantity	License
Rijksmuseum	High resolution images of Artworks	208,000	Public Domain (CC-0)
Los Angeles County Museum of Art	High resolution images of Artworks	20,000	Public Domain
Getty Research institute	High resolution images of Artworks, Books	99,000	Public Domain
British Library	Images of Book Illustrations	1,000,000	Public Domain
Wellcome Library	High resolution images of Artworks, Book illustrations, Photography, and manuscripts	100,000	Public Domain (CC-BY)
National Gallery of Art, Washington	High resolution images of Artworks	45,000	Public Domain
Statens Museum for Kunst	High resolution images of Artworks	25,000	Public Domain (CC-0)
Yale University Art Gallery	High resolution images of Artworks	250,000	Public Domain
Internet Archive	Images, Text, and OCR of Books	8,000,000	Public Domain
Early English Books Online Text Creation Partnership	Textual Transcriptions of Early English Books	25,000	Public Domain

Table 1: Collections recently placed into the public domain by a variety of institutions.

There are, of course, other GLAM sector institutions putting material online which does not conform to the Open Definition of reuse and access: for example, in the UK, the Public Catalogue Foundation has recently digitised the entire UK national

collection of oil paintings, putting online images of over 200,000 works of art owned by the state and local authorities, and held in charitable trust for the benefit of the public (<http://www.bbc.co.uk/arts/yourpaintings>). However their license states that “Images and data associated with the works may be reproduced for non-commercial research and private study purposes” (Your Paintings 2015). The Smithsonian has recently made 40,000 images of its Asian collections available, but only for non-commercial reuse (<http://www.asia.si.edu/collections/edan/default.cfm>). It can be argued that the digitisation of collections in this manner still opens up potential for study and access, although it does put limits on reuse, remixing, and repurposing, and so falls short of the Open Definition of reuse *for any purpose*: many digitised collections which do not make a full commitment to Open Access often put their own limitations on acceptable reuse, and users have to be careful to understand and negotiate acceptable reuse. This can be eminently confusing for users of digitised cultural heritage: the Europeana website, an internet portal that provides an interface to millions of items from different digitised collections across Europe (<http://www.europeana.eu/portal/>), currently has twelve different potential copyright licenses that can be assigned to each digital item and it is not often entirely clear why or what they cover. Worse than this, instead of even stating a license, the Google Art Project (<https://www.google.com/culturalinstitute/project/art-project>) which makes available 40,000 high resolution images of artworks from 250 museums worldwide skirts around the copyright and licensing issue entirely, not providing any licensing information next to each downloadable image, but claiming (in a previous licensing statement no longer available on their website)

The high resolution imagery of artworks featured on the art project site are owned by the museums, and these images may be subject to copyright laws around the world The Street View imagery is owned by Google. All of the imagery on this site is provided for the sole purpose of enabling you to use and enjoy the benefit of the art project site, in the manner permitted by Google’s Terms of Service. The normal Google Terms of Service apply to your use of the entire site (Google 2013).

The needs of the user, and the rights of the user to reuse these images, are therefore not clear: how can users trust the content they are finding, and know that they will not be pursued for damages should they choose to reuse it? The difference between

digitising content to make it more accessible and making digitised content Open Access is all in the choice and the promotion of a clear, open and free license for reuse: it can be argued that digitisation without an open license restricts reuse, and therefore access, despite ongoing rhetoric about the democratising nature of digitisation.

Changing Approaches, Changing Technologies

The reason that the History Courseware Consortium tutorials could not be distributed freely was one of timing. In the early days of digitisation there was an erroneous assumption that digitisation could both save “save millions of hours of teaching time and increase academic productivity” (Hughes 2004, p. 7) whilst generating income streams for institutions (ibid), and it was therefore right for institutions to be wary about sharing their digital content freely. However, it is now understood that digitisation of cultural heritage objects is both time consuming and costly, and revenues generated from digitised content are unlikely to exceed the costs of production (Allen 2009). It remains true that:

In a few very specific cases, commercial re-use of your digitised collections can yield useful income. You should be aware that the costs of developing digital content for commercial uses is generally higher (because the expectation of quality tends to be higher) and the financial benefit is often very small because any revenues have to be shared with partners or used to cover costs. ... where people are making money from their digitised collections, it tends to be in one of the following situations:

- The museum already has a high-value brand with a strong consumer profile (in which case the commercial partner is often paying for the right of association as much as for the content itself), or;
- The content fits into a well-defined commercial niche, such as a particular cultural theme, design or event with an existing strong commercial offer - generally, the museums that have made money from 'niche' content do so using a very small number of very high-quality or unusual images (Collections Trust 2014).

As the financial models which underpin digitisation are now better understood, the sector is now becoming more aware that if their collection do not fall into “one or both of these categories, then it might be best to think about opening them up for non-commercial personal use and social sharing, so that they can encourage more people to visit your museum!” (ibid). It is now becoming obvious that revenue generated from image licensing “matters less than many institutions think it does” (Kelly 2013, p. 1).

As well as this misapprehension about the cost and revenue models that underpin the creation of digital cultural heritage content, in the early 1990s there were simply no open licensing frameworks which were widely available and easily understood that could readily be adopted by institutions. It was not until 2001 that the Creative Commons non-profit organization was founded (<https://creativecommons.org/>), which has since publicly released several free to use copyright-licenses that allow creators and owners of works to communicate which rights they retain and which rights they wave, including how content may be taken, repurposed, and reused, and whether material can be used for private study or commercial purposes. The Open Definition, cited above, is catered for by the most generous of these licenses: providing a Creative Commons license on works that allow creators and content providers to tap into a legal framework which quite clearly sets out the intentions of the content owners when it comes to the business of making items more accessible. Resulting from general discussions and the zeitgeist surrounding Open Access, Free Culture (Free Culture, N. D), Open Content (Grossman 1998), and Open Source, the Creative Commons licenses provide a simple, standardized way to share works with a choice of conditions. At time of writing (June 2015) there are over 342 million photographs uploaded onto the popular photo sharing site Flickr with a Creative Commons license (<https://www.flickr.com/creativecommons/>).

Mechanisms for sharing and distributing digitised content have also changed since the days of physically posting a CD-Rom to your institutional chums. Appropriate uses of social media, and its relationship to the dissemination of digitised content, are being explored as the heritage sector investigates low cost mechanisms for delivering and sharing their material (Terras 2011). A core case in point is the Flickr Commons

(<https://www.flickr.com/commons>), launched in 2008 to increase access to publicly-held image collections which are shared freely online in a communal space provided the materials have “no known copyright restrictions” (Flickr, N.D.). Flickr Commons now partners with over 100 institutions from around the world, hosting millions of photographs, which can often be viewed by tens of thousands of people. The most viewed item on Flickr Commons from The National Library of Wales⁵ is a photograph Dog with a Pipe in its Mouth⁶, from the P. B. Aberly Collection. Since being put online with no licensing restrictions, the photograph has been mentioned regularly on blogs, social media, and internet chats, as well as being a featured image on the 2013 anniversary of Flickr Commons: ultimately, its wide use (it has been viewed by more than 20,000 Flickr users) has encouraged traffic towards its host institution's site (Terras 2014). As well as Flickr, institutions are using other social media channels such as Pinterest, Tumblr, and Twitter to share their content widely: an example of this is the British Library’s “Mechanical Curator”⁷ which randomly selects an illustration from their collection of 60,000 out of copyright digitised books and posts it to a Tumblr blog every hour.

Making content available can allow playful interactions through the use of social media, which drive traffic to an institution’s website, whilst also highlighting individual items within the collection and disseminating them to a wider audience.

the harnessing of online activities and behaviour to aid in large-scale ventures such as tagging, commenting, rating, reviewing, text correcting, and the creation and uploading of content in a methodical, task-based fashion

⁵ <https://www.flickr.com/photos/lgc/>

⁶ <https://www.flickr.com/photos/lgc/3467832779/>

⁷ <http://mechanicalcurator.tumblr.com/>

Evidence of Reuse

We are now at a stage, then, where large amounts of (out of copyright, or copyright cleared) material is starting to be placed online with generous and open licenses to encourage use and uptake of digitised cultural heritage content. Much of that material is digital images of artwork, photographs, and documents (it remains easiest to create digital image surrogates of cultural heritage, rather than searchable electronic text, or digital audio, video, or 3D models (Terras 2015a)) although there is also a significant amount of electronic textual material available. Most material that exists in video or audio format is still under copyright due to the age of these media, although collections of material where copyright has been cleared and material put into the public domain under an open licence are available: such as the nearly two million films (<https://archive.org/details/movies&tab=collection>) and the two and a half million audio clips (<https://archive.org/details/audio>) also in the Internet Archive, and similar materials are available on Europeana and Openculture. It is now possible to search on Youtube.com, the main platform for the delivery of digital video, for material which is available under an open license. Content is there to take, share, remix, study, analyse, and republish (providing users have access to computational infrastructure – such as machines, software, networks, and subscriptions, which should not always be taken from granted, see Gooding 2013). The question is therefore raised: within the study of arts, humanities, culture and heritage, what are people doing with this digitised and freely available content?

Understanding reuse of digitised content is incredibly difficult. A variety of research methods have to be applied in order to understand uses and impacts of digital resources, including quantitative measures such as “webometrics, log file analysis, scientometric (or bibliometric) analysis, and content analysis” complemented “by an array of qualitative measures (stakeholder interviews, resource surveys, user feedback, focus groups, and questionnaires)” that capture “information about the

whole cycle of usage and impact” (Meyer *et al* 2009, p. 6). Despite huge levels of investment into the digitisation of cultural and heritage material, and pressure from funding agencies and governments “on the need to demonstrate the ‘impact’ of publically funded resources and research, as a means of quantifying the value of the investment in their creation” (Hughes 2012, p. 2) it is often difficult, if not impossible, to gain access to statistics and reports regarding how digitised collections have been used and appropriated. There are reasons for this:

such studies are activities that require the time and effort of staff, and therefore additional investment after a resource has been published. This is often a daunting prospect – digital projects are usually developed through short-term funding, with staff on short-term contracts. Therefore, after they are launched, they are seldom given any more than the most cursory technical attention (Hughes 2012, p. 9).

In addition, the creation of open access resources in the cultural and heritage sector is so very *new*, that they have not yet had the time to bed down into normal, everyday academic practice, and we have not yet had the time to study and evaluate the consequences in a robust and structured way. The limited research tools available to track use, plus the limited reporting mechanisms provided by third party social media platforms where institutions are being encouraged to share content (such as Flickr and Wikimedia Commons) also hampers understanding of where GLAM material is going, and how it is being used (Coll 2015): understanding of use is often limited to the analysis of user comments left online, or looking at what people have “favourited”. Investigations into the impact of large scale digitised collections are only beginning to emerge (such as Gooding 2014). A good overview of approaches and methods available to understand use is available in Meyer *et al* (2009) with an analysis of the implications to be found in Hughes (2012). A range of ongoing projects, including comments on user engagement, is covered in Sanderhoff (2014). The shared experiences of eleven museums who have created open access image collections of their works of art is available in Kelly (2013) who found that:

Although most museums have not followed a policy of open access long enough to have significant data about the use of their images, there is evidence, mostly anecdotal, that their images are appearing more often in a variety of contexts... virtually every museum reported increased website

traffic, as well as what they considered a significant interest in the available images. Website visit increases ranged from about 20 to 250 percent, with many museums reporting increases of at least 100 percent. In some cases, curators are fielding better and more interesting inquiries from scholars and the public about the works in the collections as the available higher resolution images yield more detail about the works (p.24-25).

Gathering more robust understanding of how users are approaching the vast arrays of digitised content available and open to them is a pressing area of research in Library and Information Studies.

Despite these limitations on knowing how the majority of open digitised cultural heritage is being reused, there are specific instances we can point to which show the potential for building these materials into both teaching and research. As well as being encouraged to publish in an Open Access fashion, academics are being encouraged to engage with Open Educational Practices, which are defined by the International Council for Open and Distance Education (ICDE) as “practices which support the production, use and reuse of high quality Open Educational Resources (OER) through institutional policies, which promote innovative pedagogical models, and respect and empower learners as co-producers on their lifelong learning path. (n.d.)” However, although the theoretical benefits of open practices are understood, “the use of open content for teaching and learning has not been rapidly adopted” (Atenas *et al* 2014, p. 29). There are clear opportunities for further building open access content from cultural and heritage institutions into teaching materials, and indeed, when individual OER resources are examined, it is possible to find courses that are already doing so: for example a course on the Mexican-American Borderlands Culture and History by AnaMarie Seglie embeds Creative Commons licensed material on Native Americans during the Mexican War from Rice University (Seglie 2011); an overview course on “Feminist Approaches to Literature” offered as part of the University of Oxford’s “Great Writers Inspire” project gathers together and links to openly available eBooks, pictures, lectures, and videos on the topic (O’Connor 2015). It is worth considering that our History Courseware Consortium tutorials would be available online today had they been able to tap into banks of material that were clearly flagged for open reuse (although they would probably have

been called MOOCs): there are increasing opportunities for those within all levels of the education sector to utilize and embed digitised historical sources within coursework and research without having to go through their own lengthy and expensive negotiations on licensing. As more educational practitioners become aware of these Open Access resources, we can expect their use to spread throughout the sector.

Likewise, there are further potentials for the aggregation and sharing of Open Access cultural data to improve searching across collections. Serendip-o-matic (<http://serendipomatic.org>), an experimental search interface built in one week in an open-source development institute sponsored by the National Endowment for the Humanities, provides a “serendipity engine” that helps users discover photographs, documents, maps and other digital documents from open access collections such as the Digital Public Library of America, Europeana, and Flirck (Serendip-o-matic, 2013). At University College London, research is ongoing into the collation of openly available images of art (such as the collections mentioned above) into an online encyclopedia of art, under the banner of the Useum project (<http://useum.org/>). Experimenting and playing with datasets in this manner will both promote the use of individual collection items, but also encourage others to view open cultural data as a set of data which can be repeatedly reused and reconfigured.

Open Access historical sources also carry obvious implications for research. Firstly, access to primary source material for research can be increased, and barriers to featuring primary historical sources in published research outputs can be lifted, should generous, open licensing be applied to source material. In addition to this, making high quality digital resources available can lead to new and novel methods being developed that work with cultural heritage materials. An example of this is the advanced digitisation of the Syriac Galen Palimpsest, an eleventh-century liturgical text that is important for the study of the hymns of Byzantine and Melkite Christianity, held in a private collection but loaned to the Walters Art Museum, Baltimore for imaging (Toth *et al* 2010). A core set of high resolution original and processed digital images with accompanying metadata and complete documentation was made available at <http://digitalgalen.net>, under a Creative Commons Attribution

3.0 Unported Access Rights license, allowing anyone to have access to and reuse the image files, although “It is requested that copies of any published articles based on the information in this data set be sent to The Curator of Manuscripts” (ibid). Presenting the manuscript images in this way allowed new source material to be studied by the research community working on Syriac scientific manuscripts, particularly in comparing this manuscript to a related one in the British Library (Bhayro *et al* 2013, Schrope 2015). It also allowed the researchers to publish the images with their findings. However, making the high resolution images available under an open license with full documentation also allowed researchers working on advanced imaging techniques within the cultural and heritage to test and develop their algorithms further by using this important document as a test case (Giacometti 2013, Giacometti *et al* 2015). Making material from cultural and heritage projects open for reuse can therefore have unforeseen benefits to the research sector and aid in interdisciplinary, computational research.

A further development in the Arts and Humanities research area is the embracing of “Big Data” techniques, using methods from data science to analyse large bodies of historical source material to answer research questions on culture and society:

By choosing to work with very large quantities of digital data and to use the assistance of machines, the ... investigators have demarcated a new era—one with the promise of revelatory explorations of our cultural heritage that will lead us to new insights and knowledge, and to a more nuanced and expansive understanding of the human condition (Williford *et al* 2012, p. 1).

Researchers working in this interdisciplinary area are building methods from the ground up, grappling with intellectual, ethical, and procedural issues as they understand how best to use computationally intense research methods in the arts and humanities: “What are the intellectual benefits, and what are the risks? How does this new research align within the traditional context of scholarship and how might it be distinct?” (ibid, p. 8). Moreover, this is work which is dependent on both having access to knowledge, methods, and computational infrastructure to apply processing methods to cultural heritage, but also is dependent on having access to enough *data* to process and analyse – which is where openly available data sources become important. For example, The Public Catalogue Foundation’s two hundred thousand

digitised paintings were used to visualize the change in the colour palette of oil paintings over time (the fact that this was for private study meets their terms and conditions of reuse). The analysis showed a reliable trend that a growing number of paintings used blue pigments throughout the 20th Century, particularly in oil paintings, which requires further investigation into the socio-economic reasons why this may be (Bellander 2015). The Structural Analysis of Large Amounts of Music Information (SALAMI) project (<https://ddmal.music.mcgill.ca/salami>) processed openly available music sources from the Internet Archive, establishing a method for the processing of musical information and delivering a substantive corpus of musical analyses for use by scholars. The Epidemiology of Information project sought to understand how newspapers influenced public opinion during the 1918 influenza pandemic, exploring hundreds of digitised newspapers to do so (<http://www.flu1918.lib.vt.edu/>). A project at the British Library has seen the mounting of their 60,000 public domain digitised books onto University College London's high performance computing facilities, to both aid humanities scholars in the searching and visualisation of the dataset, but also to understand the potential for process and service development in delivering such high performance computing applications in the cultural sector (Baker 2015). There is much crossover here with information science and understanding how to deal with vast amounts of online information: Manovich's work on "How to compare one million images?" looked at images from contemporary manga publications to see how digital image analysis and visualization techniques could be used to understand the range of graphical techniques used by manga artists (2012), but the techniques applied to contemporary data could also be applied to the art historical datasets which are now becoming openly available. We are only just beginning to understand how best to reuse and process the volumes of data now available from the cultural and heritage sector to both ask, and answer, research questions in the arts and humanities.

Ongoing Barriers to Open Data in the Cultural Heritage Sector

Despite these advances in both the creation and uptake of open cultural data, there is still a long way to go before it is commonplace for all Galleries, Libraries, Archives and Museums to make their collections available online under open licenses. Barriers remain, mostly in the conception of what it means for the institution - in both a financial and reputational sense - to behave in an open manner. It is helpful to bear in

mind here that it is often senior individuals who are not embedded into digital culture that make the final decisions regarding institutional digital strategies: these are the people who need to hear the OpenGlam movement's evangelising.

We have also mostly dealt with material in this paper which *can* be easily made available: that which is out of copyright, or that which institutions own the copyright to and can therefore choose to release under open licenses, or that where the copyright holder can be traced in order to grant or deny permission to share openly. There is a difficult issue regarding “Orphan Works” in the GLAM sector: “creative works or performances that are subject to copyright - like a diary, photograph, film or piece of music - for which one or more of the right holders is either unknown or cannot be found” (UK Government Digital Service 2015). These make up to 50% of works in UK Archives, with an estimated 25 million items across UK public sector organisations falling into the Orphan Works category (Korn 2009), although this is a worldwide problem which is leading to “a ‘locking up’ of content with little or no prospect of these items ever making a meaningful contribution to a knowledge economy without potentially complex and costly ‘due diligence’ processes” (ibid). Openly available digital content is therefore reduced to material produced prior to the 20th Century to ensure that it is copyright compliant, resulting in a “black hole” of digitised 20th and 21st century history (ibid). In 2012 a new European Directive on Orphan Works was published to tackle this problem (European Commission 2012) but the resulting governmental frameworks created to address the issue of reproducing works when rights holders cannot be found are costly and cumbersome, meaning that the ability of libraries and archives as well as other cultural heritage and educational organisations to provide digitised access to our rich content will continue to be crippled, thus undermining the rationale and anticipated benefits of the legislative provisions in the first place (LACA 2014).

We're back to where we started with the History Courseware Consortium tutorials: not only can we not share many materials online, but the complex legal frameworks which exist mean it will be exhausting to pursue individual permissions to include them for teaching or research, never mind commercial reuse. There is much that remains to be done so that we can be allowed to create, openly share, and reuse digital instantiations of our cultural heritage.

Conclusion

This paper has highlighted the increasingly open approach to the delivery of cultural heritage data, viewing it primarily from an arts and humanities researcher stance. Although the information environment in which digitised content is created and delivered has changed phenomenally over the past twenty years, allowing the sharing and reuse of digital data and encouraging new advances in research across the sector, issues of licensing and accessing content persist. There are further opportunities for understanding how to: study use and users of openly available cultural and heritage content; disseminate and encourage the uptake of open cultural data; persuade other institutions to contribute their data into the commons in an open and accessible manner; build aggregation and search facilities to link across information sources to allow resource discovery; and how best to use high performance computing facilities to analyse and process the large amounts of data we are now seeing being made available throughout the higher education sector. Additionally, there are opportunities to understand better the financial models which underpin digitisation activities, and to understand the longer term reputational benefits to institutions through making their collections open in this manner. The potential benefits to research and scholarship are immense, as, in the same way that the Open Data agenda is being used in the Sciences, Arts and Humanities scholars will be able to publish research whilst pointing to the material upon which conclusions are drawn. In addition, the growing number of datasets becoming available also offer new computational opportunities and approaches to understand and analyse our cultural heritage and human society. There are, of course, further potential benefits to the commercial cultural and creative industries which have only been touched upon here.

Although barriers still remain to the opening up of cultural and creative content, including issues with institutional strategies, and the major problem of copyright clearance for Orphan Works which is shaping which periods of cultural content are available for use and analysis, the following years will continue to see an exploration of how best to use open cultural and heritage content, showing that open data and open research is not just applicable in the sciences, but can open the door to our collections, our institutions, and an understanding of our shared cultural heritage.

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