ASSESSING THE AUDIOVISUAL ARCHIVE MARKET
Models and Approaches for Audiovisual Content Exploitation

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ABSTRACT

In recent years, audiovisual archives, large and small, have been making their holdings accessible online and have started exploring a mix of models for revenue generation and what might be called knowhow generation through innovative partnerships with commercial and non-commercial institutions. This paper sheds light on the new ways that archives have been examining, appreciating, and even embracing business and commercial interactions in the digital age. It describes models and tools that have proven successful, and provides recommendations to help those who curate audiovisual heritage content appreciate and maximise better the value of their assets.

Key words: audiovisual, video, archives, content, online, access, digital, digitisation, business, commercial, value, public

INTRODUCTION

The preservation of audiovisual materials has long posed challenges for libraries, archives, museums, and other professional custodians. From the days of the first audiovisual archive — Austria's Phonogrammarchiv, according to UNESCO, founded in Vienna in 1899 — to the 2011 establishment of PrestoCentre and its now 60-plus members and affiliates, audiovisual archives have represented a uniquely "complex and multidisciplinary domain," one involving "such diverse fields," a PrestoCentre report notes, "as chemistry, physics, signal processing, robotics, and artificial intelligence" (among many others). The advent of digitisation, and the recent promise of mass digitisation, together have rendered longstanding preservation challenges even more complex. Staff at cultural heritage institutions who had amassed "decades of experience . . . dealing with physical carriers [media]: visible, held in the hand, stored on shelves, and played on dedicated devices" now watch as the process of digitisation forces audiovisual content to undergo "dramatic change":

> "[C]ontent is being migrated to files: invisible, stored 'in the cloud', and played by unknown technology at a remote machine. How can these collections be efficiently managed, so that files don't get lost (metadata, file, and storage management), do keep their correct relationships with other files (provenance), do maintain their technical (quality), legal (rights), and archival (quality, provenance, rights, metadata) integrity? How can AV content be preserved forever (without going broken [sic] almost immediately)?"

Funders of cultural heritage digitisation increasingly call for access — public, online access — to be the newest and paramount objective for memory institutions. The European Commission's influential Comité des Sages, addressing the future of digitisation on the continent in its 2011 publica-

tion The New Renaissance, noted: "If one word should encompass [our mandate], it would be access. . . . When it comes to our cultural heritage, there is no bigger challenge, no more urgent question, than to secure the access of current and future generations to this heritage."[1]

Digitisation technology and these new norms and public expectations have brought us to the point where preservation and access together form a new imperative for audiovisual archives: twin missions — preservation for access, access for preservation — that twist around each other like the double helix of a modern memory institution's DNA. What resources are likely to be found for these programs — and where will they come from? Will preservation activities — the older mission — be funded from one set of resources, and the access mandate — especially the online access mandate — be funded from another? With a global financial crisis just four years behind us — and other years of "precarity" possibly in front of us — how will financial and knowledge resources become available for cultural institutions to accomplish both objectives: to systematically preserve and make publicly accessible the world's audiovisual collections?

In recent years, audiovisual archives large and small have been making their holdings accessible online through their own websites, individually — such as at the British Film Institute and the French Institut National de l'Audiovisuel — and occasionally in a collective with like-minded national institutions, as in the Dutch Sound and Vision's Images for the Future project[2] or with regional/multinational partners, as in the German Kinemathek's effort with Czechs, Poles, and others to post and locate films once presumed to have been lost to history.[3] With support from the European Commission, and in an effort to focus less on borders between European states than on the heritage common among them, archives also have been exploring ways of making audiovisual content available through broad multilateral aggregators and portals, uniquely online institutions, in fact, including first and foremost Europeana[4] but also film-specific European initiatives such as the European Film Gateway[5] and EUscreen[6].

Archives also have been exploring a mix of models for revenue generation and what might be called knowhow generation through innovative partnerships with non-commercial institutions as well — the BBC Archive recently helped launched "TheSpace"[7]; various archives are looking at experiments with Wikipedia (and its Wikimedia Commons[8] especially), as well as with commercial enterprises who are busy soliciting new kinds of relationships in the field. The commercial relationships range across the licensing relationships that several archives have in place with sales agents and representatives such as Getty Images; to small- and medium-size distribution arrangements such as several countries have with Apple iTunes and Voddler; to digitisation & sales projects underway now with, among others, Amazon, Netflix, LoveFilm, and Google/YouTube.

With this last set of public-private relationships in mind, this paper will shed light on new ways that archives have been examining, appreciating, and even embracing business and commercial interactions in the digital age. Based on extensive research and interviews with archive directors and staff, this paper assesses the market of audiovisual materials in the digital age; reviews opportunities for unlocking some of that value through commercial relationships and especially public-private partnerships; explores lessons that commercial sector institutions may have for non-commercial archives; and proposes seven recommendations and five new tools that might be useful for the com-

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1   The New Renaissance: The Report of the Comité des Sages Reflection Group on Bringing Europe's Cultural Heritage Online (Brussels: European Commission, 2011), online at: ec.europa.eu/information.../refgroup/final_report_cds.pdf. "Digitisation," the report states, is more than a technical challenge; "it is a moral obligation."

2   http://imagesforthefuture.com/en/

3   https://www.lost-films.eu/index/about

4   http://www.europeana.eu/portal/

5   http://www.europeanfilmgateway.eu/

6   http://www.euscreen.eu/

7   http://thespace.org/

8   http://commons.wikimedia.org/wiki/Main_Page

munity — archives large and small — as new partnerships take hold and older ones deepen.

The extraordinary value of audiovisual archives and the extraordinary cost of rendering them digitally well preserved and accessible both loom over this document. Costs for proper preservation in particular cannot be overemphasized. As one of our interviewees — a librarian overseeing a substantial audiovisual collection — told us, use now has begun to define value. If an item is used, or can be made to be used, he said, the archive that holds it increases that much more in public value. But the obverse is also true: that if the item is not well preserved and conserved, future users will not be able to access its contents and study it as an artifact; its archive ought to decrease in public value, although over time, as a result.

The nuclear helix of the modern archive involves preservation and access, co-dependent and tightly wound. Thinking and planning for preservation and enabling access strategies — especially online access strategies — are complementary tasks that inform one another in the digital age. Audiovisual material and corresponding information — scripts, notes, images, and especially metadata — that go online become part of the grand conversation that takes place around media every day on the web, and that conversation is one of the best marketing tools that exists to insure the relevance of an audiovisual collection for the public — and for funders of access and preservation. Perhaps counterintuitively, the more open the rights and licenses are that govern such material, the more unrestricted the online access becomes to use and reuse, and thus, the easier it becomes for that conversation — a conversation that involves participants as diverse as Wikipedia, Facebook, and Google, where articles and applications and embeddings serve only to popularize the holdings — to feature the host institution and the core, authoritative information that home institution wants to put forward about the assets it has been curating.[9]

That said, tensions have abounded between access and preservation goals at cultural heritage institutions — indeed, these tensions have predated the web. While much of this report is given to access strategies for digital content, many archivists remain focused in their day jobs on finding resources for preservation. One archive director — at one of the world's greatest audiovisual archives — told us he has rejected private-sector deals because prospective partners would not fund preservation-quality digitisation for his video files. Professional discussions on, for example, the listserv of the Association of Moving Image Archivists, routinely involve calls among archivists for a new language to describe digital preservation and restoration, lest those terms wind up encompassing, and being replaced in the public mind by, the less involved and less expensive tasks of making digital copies of moving images available for access.[10]

Although the tools I propose at the end of this paper involve — or will involve, once the tools are built — creative measurements and mathematical formulas, one has to note here that there still is no solid agreement in the field about the algebra for computing the cost of digital preservation for an asset versus the cost of digitizing that same asset for access. One archive specialist proposed to us that establishing a preservation-quality moving image file costs twice as much as creating an access-quality file. "And why digitise a large volume in access quality," he asked, "when for a factor of two the preservation problem could be solved?" Another archive director, however, has calculated this cost ratio standing at 5:1. And yet another expert on digital archiving and restoration reminded us that the cost of creating a restored 4K digital file of "Dr. Strangelove," Stanley Kubrick's 95-minute classic, cost USD 2 million,[11] vast multiples — far beyond 5 to 1 — over what a commercial partner is likely to invest to digitise two hours of content.

Whatever the relationships that preservation and access goals turn out to have with each over

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9   The benefits not only of access but of open access are becoming
     evident in fields as diverse as culture and science. See Harry
     Verwayen, Martijn Arnoldus, and Peter B. Kaufman, "The
     Problem of the Yellow Milkmaid: A Business Perspective on

Open Metadata" (Europeana White Paper # 2: The Hague,
     2012), online at http://pro.europeana.eu/yellow-milkmaid

10   http://www.amianet.org/participate/listserv.php

11   http://www.sonypicturesmuseum.com/film/restored/
     strangelove

time, part of the objective of this paper is to suggest that support for one is support for both. Both together will be part of the new thinking of the 21st-century archive — thinking that stresses the importance of these assets for 21st-century learning as well as national memory and self-understanding. That new thinking, in turn, will encourage state funders of archives, along with commercial partners and the occasional private philanthropy, to develop a more organic understanding of use rights in the digital world, and eventually a new matrix of licenses — one which we address in the toolsets below — that facilitates the possibilities for growing future value more than it reflects the restrictive covenants that had been sealed in an earlier, principally analogue age.

With the first archive having been established in 1899 — that earlier, analogue age — this then is now the second century, the digital century, of audiovisual archives. The access strand in the new double helix of preservation and access is moving and coiling ever faster now — largely with fresh energy from the Internet.[12] This paper we hope provides a framework for archivists to take advantage of that energy. Not all the recommendations I set forth below necessarily apply to every audiovisual archive, and although I interviewed directors and staffs at archives large and small, not all the tools that I recommend building will be of use to everyone. Funding for general and administrative work is always challenging to secure, and business relationships that turn out to support digitisation are still today the exception rather than the norm. Yet new opportunities for cultural heritage institutions to develop business models, revenue streams, and business knowledge — and in the process gain an even greater appreciation for the role they play in media, society, and our economies today — abound. This paper, focusing as it does on such opportunities, may provide activists in the field with inspiration and support.

ASSESSMENT AND VALUATION

A word, first, on value. Around the world every hour, audiovisual archival materials are being used to enhance television programs, films, and media online. In the same way that oil, pumped from the ground, is refined and then used to fuel transportation and industry, or iron, mined from the ground, is smelted into steel and used in construction, so audiovisual materials mined from the archives form part of the backbone of information, communication, and our creative knowledge economy, worldwide.

How do we estimate the value of the audiovisual archive industry? In the gold, steel, oil, and gas industries, which have been around for longer than film and television, various metrics have been devised to measure the size of asset reserves and materials that remain to be pulled out of the ground. An estimated 1.3 to 1.4 trillion (a million million) barrels of oil lie still buried in the Earth, for example; and at a price per barrel of USD 95, those reserves are worth USD 124 to USD 133 trillion.[13] Gas reserves are estimated to amount to 185 trillion cubic meters, also valued in the trillions.[14] Gold reserves still remaining underground are estimated today at 50,000 metric tons, for a late 2012 valuation, at USD 1,615 per Troy ounce, of approximately USD 3 trillion.[15]

The size of the audiovisual archive asset base — and its corresponding value — is less well

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12 A good visualisation of DNA moving is available online here: http://www.wehi.edu.au/education/wehitv/molecular_visualisations_of_dna/

13 http://en.wikipedia.org/wiki/Oil_reserves
https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html
http://www.nationmaster.com/graph/ene_oil_res-energy-oil-reserves

14 http://en.wikipedia.org/wiki/
List_of_countries_by_natural_gas_proven_reserves

15 http://www.galmarley.com/framesets/
fs_commodity_essentials_faqs.htm. Interestingly, all of the gold mined since the dawn of man amounts to only some 165,000 metric tons — about the size of a cubic tennis court, or, in the words of one historian, only enough to fill a modest two-story townhouse. Liaquat Ahamed, Lords of Finance: The Bankers Who Broke the World (New York: Penguin, 2009), p. 13. In any event, investors seeking to bring this gold archive to the surface have a good and clear sense of their ultimate reward.

known. This report speaks of cultural heritage materials and economic and commercial valuations of the same in one breath. Some professionals may object to this, yet culture has long been a business: film studios, recording companies, and publishing houses, among others, are routinely traded, in equity and bond markets and in private transactions, on the strengths of the commercial potential their assets possess (more on this below). Archivists themselves readily compare their assets to natural resources, predicting, for example, that digitizing and making accessible audiovisual archives will ignite a "creative revolution" comparable to the industrial revolution that coal mining catalysed in the 19th century.[16] Advocates for digitisation, including policymakers, likewise have described the cultural heritage industries as revenue-drivers, not just for the economic future of their largest custodial institutions — museums, libraries, archives and the like — but as fuelling an economic stimulus for surrounding national and regional industries and society at large.[17]

We do know that the size of this audiovisual archive market — or even more broadly, its political economy — is significant. Research reports that focus on access to audiovisual heritage have only touched the surface with their approximate appraisals. EUscreen's 2012 report on access to European audiovisual heritage, for example, cites a 2012 study estimating that "the worldwide footage industry" is "worth USD 394 million" and an earlier work pegging "the global trade in audiovis-

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16 A video interview of Tony Ageh, controller of archive development at the BBC, is well worth watching: "Knowledge Is...," produced by the JISC Film and Sound Think Tank, available in Paul Gerhardt and Peter B. Kaufman, "Film and Sound in Higher and Further Education: A Progress Report with Ten Strategic Recommendations" (London: JISC, 2011), online at: http://filmandsoundthinktank.jisc.ac.uk/ch1-introduction and also at www.youtube.com/watch?v=qMLf5mpifNc (7:12-7:39). See also Lord [David] Puttnam of Queensgate, CBE, "The Creative Archive" and Peter B. Kaufman, "Enabling Creativity: The User Experience," online at http://www.bbc.co.uk/creativearchive/news/news_april05.shtml. In a recent presentation, Ageh speaks of "priming the pump" of our digital public space with "the massive wealth of archive materials" that public institutions hold, still largely in analogue form — "a rich seam of raw material" — and the BBC sitting "on the North Sea oil of the digital world." See Speech by Tony Ageh, Manchester Museum of Science and Industry, May 15, 2012, online at: http://www.opendemocracy.net/tony-ageh/guaranteeing-access-to-uks-collective-abundance-how-bbc-can-lead-way-in-creating-digital-p

17 For example, "[O]ver the next decade DP [digital preservation] could create between Euro 10 and Euro 20 billion in added value per year if it becomes mainstream practice." See: "DP Impact:

Socio-Economic Drivers and Impact of Longer-Term Digital Preservation" (Madrid: Inmark Estudios, June 2009, online at: http://cordis.europa.eu/fp7/ict/telearn-digicult/dpimpact-final-report.pdf. This is not unusual — various industries make such arguments. The World Steel Association, for example, maintains that "The industry directly employs about more than two million people worldwide, with a further two million contractors and four million people in the supporting industries. Considering steel's position as the key product supplier to industries such as automotive, construction, transport, power and machine goods, and using a multiplier of 25:1, the steel industry is at the source of employment for more than 50 million people." See: http://www.worldsteel.org/media-centre/key-facts.html (emphasis added). The European policy argument for digitizing intellectual property often comes couched in the benefits of opening not only cultural heritage assets but public data generally. For example, the European Commission maintains that "One of [our] resources is public data — all the information that public bodies in the European Union produce, collect or pay for. Examples are geographical information, statistics, weather data, data from publicly funded research projects, and digitised books from libraries. This information has a significant — currently untapped — potential for re-use in new products and services and for efficiency gains in administrations. Overall economic gains from opening up this resource could amount to Euro 40 billion a year in the EU." Neelie Kroes, vice president of the European Commission responsible for the Digital Agenda, tweeted in September 2012 that she and her team have "made decisions that saved taxpayers Euro 15 billion & consumers more than Euro 35 billion" since 2005. See: "Open Data: An Engine for Innovation, Growth and Transparent Governance" (Brussels: European Commission, 2011), online at: http://ec.europa.eu/information_society/policy/psi/docs/.../open_data.pdf and Kroes's Twitter account, @neeliekroeseu.

ual archives" at "Euro 364 million."[18] Sizable as these figures may seem, they represent only a fraction of the whole picture. Comprehensive valuations of "the worldwide [beyond Europe] footage industry" and "the global trade [also beyond Europe]" in film and television moving images — big words, italicized for emphasis, and core to our work — necessarily would involve multiples of such annual revenue; that annual revenue, to be calculated in full, would require factoring in advertising dollars, co-investments, and other income-generators for such content, whether or not it was licensed, sold, or provided intentionally by its owners; it would need to include not just public-sector but public- and private-sector institutions (worldwide); and various pro forma force multipliers — on the order of the steel industry's estimates or the European Commission's estimates about public data — would need to be factored in, too.

The material assets of this "industry" — its exploitable property, if one allows — have only recently begun to be inventoried. Proper inventories for audiovisual archives — whether the U.S. Library of Congress's listing[19], for example; or the stock-footage business's[20]; film collections[21]; or even UNESCO's own[22] — seem forever incom-

plete. UNESCO, in 2005, appraised world audiovisual holdings at 200 million hours, with 50 million of those hours located or sourced from Europe.[23] The sources for this appraisal are opaque. The European Commission's Comité des Sages, for its 2011 publication The New Renaissance, commissioned the Collections Trust to estimate the number moving image and sound assets in museums, libraries, and archives across Europe. The Trust, a non-profit U.K. consultancy, averred that it had "adopted as rigorous a methodology as possible," while acknowledging throughout the report mainly exogenous limitations to that methodology. Discoveries included:

- There are approximately 10.81 million hours of Audio material in European cultural institutions.

- There are approximately 12.14 million hours of Video in European cultural institutions.

- There are approximately 1.03 million hours of Film in European cultural institutions.

- The total cost of digitising the eligible AV material in European cultural institutions would be approximately Euro 4.94 billion (a thousand million).

The report was missing key elements of interest here. "This Report features completed data for the Digitisation of collections in Libraries, Museums, Archives and Audiovisual Archives. It does not include data concerning the broader AV collections held by Broadcasters, although we would recommend the inclusion of these in a future investigation."[24]

18 Erwin Verbruggen and Johan Oomen, "Online Access to Audiovisual Heritage Status Report," EUscreen Deliverable D7.6.2 (July 23, 2012), online at: http://pro.europeana.eu/ documents/864473/82a7fb98-6be2-4572-b211-e1656837f6f1, p. 11, cite Claire Harvey, "The Global Trade in Audio-Visual Archives" (London: Screen Digest, FOCAL International, and FIAT/IFTA, August 2010), with info online at: http://www.screendigest.com/reports/201074c/10_08_the_global _trade_in_audio_visual_archives/view.html and http://www.focalint.org/industry-news/news/243/audio-visual- archives-see-opportunities-for-growth. See also Marius Snyders, Hans Westerhof, and Jeff Ubois, "Financial Models and Calculation Mechanisms," PrestoCentre, 2011, online at: http://www.prestocentre.org/library/resources/financial-models- and-calculation-mechanisms.

19 http://www.loc.gov/film/arch.html

20 http://stockfootagedirectory.org/footage-providers

21 http://www.16mmdirectory.org/

22 http://bit.ly/w5m6Ec

23 See: Johan Oomen, Roeland Ordelman, "Accessing Audiovisual Heritage: A Roadmap for Collaborative Innovation," IEEE Multimedia 18, no. 4, pp. 4-10, Oct.-Dec. 2011; and http://portal.unesco.org/en/ev.php-URL_ID=13139&URL_ DO=DO_TOPIC&URL_SECTION=201.html UNESCO recognised audiovisual holdings as equivalent to other cultural heritage media only in 1980.

24 Nick Poole, "The Cost of Digitising Europe's Cultural Heritage: A Report for the Comité des Sages of the European Commission" (London: The Collections Trust, November 2010), online at http://ec.europa.eu/information_society/activities/

If audiovisual archives were evaluated as Hollywood studios are evaluated, or as television networks that are bought and sold are evaluated, rather than by GLAM-ordained consultancies or a series of self-administered and half-answered questionnaires, the size of the audiovisual archives "industry" would be recognized more appropriately in the billions of U.S. dollars. In a period when BBC Worldwide generates sales of GBP 1.1 billion in 2011; France's INA licensing generates hundreds of millions of Euros in advertising revenue; and Getty Images, a static image licensor mainly, and one that controls a great number of rights — but still only one piece of a portion of this trade —

has been appraised and sold for USD 3.3 billion, it may be more appropriate to begin an industry assessment another way.[25]

Indeed, it may be more appropriate, rhetorically and in fact, to commence an appreciation of the audiovisual archive market by recognizing that it is part of the worldwide media and information market, one recent private (by Pricewaterhouse-Coopers LLC) evaluation placing that market size at USD 1.3 trillion. This valuation — by global teams of accountants and analysts — looks beyond three-screen (TV, internet, mobile) forecasts to study in detail all markets, platforms, and channels for audiovisual content, including all those where film and sound assets could be valorised:

- Internet access: wired and mobile
- Internet advertising: wired and mobile
- TV subscriptions and license fees
- TV advertising
- Recorded music
- Filmed entertainment
- Video games
- Consumer magazine publishing
- Newspaper publishing
- Radio
- Out-of-home advertising
- Consumer and educational book publishing
- Business-to-business[26]

digital_libraries/info_centre/cultural/index_en.htm. See also: Natasha Stroeker and René Vogels, "Survey Report on Digitisation in European Cultural Heritage Institutions 2012" (Amsterdam: Panteia on behalf of the ENUMERATE Thematic Network, May 2012): www.enumerate.eu/.../ENUMERATE-Digitisation-Survey-2012.pdf; "Numeric — Statistics on Digitisation of Cultural Materials in Europe" (London: Chartered Institute of Public Finance and Accountancy, May 2009): cordis.europa.eu/fp7/ict/telearn-digicult/numeric-study_en.pdf and here: http://cordis.europa.eu/fp7/ict/telearn-digicult/publications_en.html; and Edwin Klijn and Yola de Lusenet, "Tracking the Reel World: A Survey of Audiovisual Collections in Europe" (Amsterdam: European Commission on Preservation and Access, 2008): http://www.tape-online.net/survey.html. Many of the key surveys of audiovisual collections to date have been conducted on a voluntary or opt-in basis; as Poole states, "The TAPE figures are hampered (as are the NUMERIC statistics) by their relatively low response rate." Harvey's "Global Trade in Audio-Visual Archives" tabulates from a survey mailed to 230 companies that 42.7 million hours of content are held in audiovisual archives worldwide; but acknowledges the project survey's "responding companies represent [only] 25 percent of the global trade in archives." Even the European Commission's broader evaluations of the economic potential of the cultural and creative industries — "one of Europe's most dynamic sectors, contributing 2.6 to the EU GDP" and so forth — recognise that "more information on this sector, and especially harmonised statistics, are needed to better monitor the situation . . ." See: European Commission Green Paper, "Unlocking the Potential of Cultural and Creative Industries" (Brussels: 2010), online at: ec.europa.eu/culture/.../GreenPaper_creative_industries_en.pdf.

25 Sharon Terlep and Ryan Dezember, "Carlyle Group Sets Deal to Buy Getty Images," Wall Street Journal, August 16, 2012; and Paul Sonne and Keach Hagey, "Across Pond to New York," Wall Street Journal, August 16, 2012. Claire Harvey writes that, "The French National Archive, INA, has been using advertising on its main portal since 2006, and with its first www.ina.fr earned Euro 300,000 in ad revenue."

26 "Global Entertainment and Media Outlook, 2012-2016" (New York: PWC, 2012), info online at: http://www.pwc.com/us/en/industry/entertainment-media/publications/global-entertainment-media-outlook.jhtml

Every film and television asset that is produced, every online video asset and videogame property involving moving images and recorded sound, and every outtake from the production of each of these assets, becomes, immediately upon the publication of said asset, an element of someone's — someone's private, or someone's public — audiovisual archive, and thus an element of this global marketplace of archival audiovisual content. It thus may be far better for our purposes to start an evaluation of the sector at the high end of the picture — whether from one trillion dollars or hundreds or tens of billions of dollars — and then work backwards, rather than starting from a modest beginning and working up. Furthermore, unlike gold, oil, gas, coal, or iron, audiovisual archives' assets grow — and grow fast; imagine if coal went back into the ground, or oil or gas! Indeed, what we often call intellectual property is in many ways an endlessly renewable resource; archivists observe it growing at a rate never before seen in the history of information — with each film that is professionally produced, each television show, each online video. Statistics about this growth rate abound, but a 2012 EUscreen report puts it most memorably: "More video is uploaded to YouTube" — to say nothing of other platforms like Netflix, Amazon/LoveFilm, Hulu, Vimeo — "in one month than the 3 major US [television] networks created in 60 years."[27] As futurologist Ray Kur-zweil is wont to say, even the growth rate is growing — and as a result our shelves are bulging, our safes and cabinets are stuffed, and the provisions we make for digital storage and memory seem never to be large enough.[28]

Can public sector and philanthropic funds alone allow us to digitise this wealth — the analogue assets, but various digital formats as well — on a timeline that might matter to the current generation reading this report — which is to say, during our lifetimes? This is a question of some open-endedness. It may cost 100 billion Euros to put Europe's cultural heritage, including Europe's filmic heritage online, according to The New Renaissance. What calculations are included in this estimate? Earlier reports remind us that only 22 per cent of European cultural institutions that digitise material have long-term preservation plans in place, and that estimates for preserving and providing access to audiovisual content amount to half of to yet again the whole amount of creating that asset through digitisation in the first place.[29] Will — can? — the public sector alone provide this capital? There are, by this one count, 77 million books still to go, 24 million hours of audiovisual programs, 358 million photos, 75 million works of art, 10 billion pages of archives — and that was as of 2011.[30] As various archivists whom I interviewed noted, young people will access moving images no longer through television sets and theatre screens, but via computers. Thus maximising this creative potential of audiovisual archives worldwide online remains one of the great business and creative challenge in this, the second century of film. The value potential may well be within to reward the commercial partners who go spelunking.

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27 Verbruggen and Oomen, "Online Access to Audiovisual Heritage Status Report," p. 8. It should be remarked upon that professional film and television productions often shoot at a ratio of 50 to 70 up to 300:1, meaning (not news to our readers) that scores more audiovisual content exists in the world than just what is shown as finished on a film or television or computer screen. For comprehensive statistics on the explosive growth in audiovisual media, see the detailed reports of Cisco's research team: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.html; http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html IBM's scientists say that 2.5 quintillion bytes of new data are created now, every day. http://www.IBM/smarterplanet See also: http://www.emc.com/collateral/demos/microsites/emc-digital-universe-2011/index.htm

28 "[T]he rate of exponential growth . . . is itself growing exponentially . . . " Ray Kurzweil, The Singularity is Near: When Humans Transcend Biology (New York, Viking, 2005), p. 12.

29 "Numeric — Statistics on Digitisation of Cultural Materials in Europe" and Nick Poole, "The Cost of Digitising Europe's Cultural Heritage."

30 The New Renaissance (2011).

MINING VALUE

How then do we get to making these assets accessible and preserved? This too is an open-ended question. Relevant models that archivists have listed for revenue generation include the time-honoured and the new — from government support for preservation and access to new partnerships with business:

- Public sponsorship/philanthropy
- Corporate sponsorship/advertising
- User fee-for-service
- Submitter fee-for-service
- Membership/subscription
- Community model
- Endowment
- Services/consulting
- Joint venture between rights holder and archive[31]

For this report, models that feature a commercial partnership or business arrangement of one sort or another between a private company/companies and an education/cultural institution are of paramount interest. In 2011 the European Commission published its typology of such arrangements — public-private partnerships, or PPPs — for cultural heritage digitisation; this typology is presented in full below, numbered for the sake of convenience:[32]

Sponsoring/donation:

In the case of sponsorship, the private partner provides financing and receives a benefit in terms of branding/advertising. A distinction is often made between sponsorship and donation, where the private partner provides support without receiving any benefit (branding/advertising can be forbidden by law). In both cases, the private partner is not interested in exploiting the digitised content, but in enhancing its corporate image. These forms of PPPs are based on tax regimes where sponsors/donors can enjoy fiscal benefits (examples: Telefonica — Spanish National Library in Spain, Cervantes Virtual Library in Spain). Private sponsors/donors are more often business organisations, banks, or foundations, which can also be linked to business organisations. The funding of digitisation by private actors can be based on philanthropic or other more specific motivations, such as religious beliefs: more countries have reported archive digitisation sponsorships with the Genealogical Society of Utah (Mormon LDS Church). Another interesting model is sponsorship at individual level: 'adopt-a-book' projects where members of the public can sponsor the digitisation of a book and have their names mentioned on the digital copy (Denmark, France).

Indirect commercial exploitation:

PPPs between companies like Google and cultural institutions, as part of the Google Book project — Library Programme (and more recently Google Art) use digitisation as a component of their wider business model, where the digital copy of public domain works is normally accessible for free to the end user. Although Google has not been explicit about its detailed business model, enhancing the quality of its services as a search engine seems to be a core business objective. The recent launch of 'Google e-books' — based on agreements with publishers for bringing in-copyright works online — casts new light on Google's ambitions in the digital book market.

Direct commercial exploitation:

The investment by the private partner in digitisation is 'paid back' by the direct exploitation of the digitised content: access to content, including public domain works, is sold to the end user. This exclusivity is normally limited in time, after which the digitised material can be made available to everybody. Moreover, the cultural institution receives a digital copy, although any free-of-charge dissemination of this 'library copy' is normally

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31 These terms were developed for the Library of Congress-funded Preserving Public Television project in the United States and published in 2011. For more information, see: http://www.thirteen.org/ptvdigitalarchive/

32 European Commission Recommendation on the Digitisation and Online Accessibility of Cultural Material and Digital Preservation," Commission Staff Working Paper (Brussels: European Commission, 2011), especially pp. 14-20.

geographically bound (on-site or within the country, based on IP address control) or limited to certain institutional users (e.g. education and research communities). Examples: ProQuest PPPs for early European books: Danish Royal Library, Biblioteca Nazionale Centrale di Firenze, Dutch Royal Library; Cengage Gale — British Library; Bloomsbury — The National Archives.

Collaborative digitisation:

Using 'bottom-up' Web2 features, the potential of distributed digitisation schemes based on the active involvement of private individuals should not be underestimated (crowd-sourcing). In such schemes the private partner is not a business organisation, but a multitude of people providing either manpower or 'micro-funding' to digitise collections.

Service provision:

A mere service contract where a cultural institution buys a digitisation service from a private company should not be considered as a PPP. However, there might be more complex cases where the exchange is not limited to 'service in return for price' and the concept of PPP would fit (example: the announced digitisation PPP launched by the Belgian Federal Government with the participation of a consortium involving IBM and Belgacom).

Grant and loan programmes:

Public grant and loan schemes with the involvement of private partners are another solution for funding the digitisation of cultural assets. As with service provision, their classification as PPPs is not straightforward. Concerning loan schemes, the challenge is to generate an actual return on investment in the medium term to pay back the loan. Few but significant cases were reported by France and the Netherlands.

While public-private partnerships — and business deals of all kinds — have involved the private sector and libraries, museums, and archives for decades,[33] the emergence of new business models

to support systematic or mass digitisation spurred the cultural heritage sector to explore new forms of partnerships on a scale that previously was unimaginable. The advent of Google's initiatives in mass digitisation, and the early agreements the company concluded with individual cultural and educational institutions, awakened the community to scrutinize the types of arrangements being concluded and the specific terms and deal points in these agreements — arrangements that would fall under what the reports above characterize as the "corporate sponsorship/advertising" and "indirect" and "direct" "commercial exploitation" models (the first three of the models above).

Have these early partnerships — early because they are relatively new in the history of communications, and focused for the most part (so far) on print — properly balanced public interest and private gain? Google's early forays into mass book digitisation caught university administrators, faculty, and custodians in the field — at American university libraries, initially — completely off-guard. As a report for the U.S. Research Libraries Group noted, "When Google executives [and they were top executives at the time] separately approached the initial five libraries about digitizing their holdings, at first many staff reacted to their offer with disbelief. One librarian . . . wondered what they were smoking."[34] Yet in many ways, the Google Books initiative — perhaps more than any other public-private arrangement in the field of cultural heritage — has over the intervening years prepared public-sector institutions for what may happen with commercial investments — and partnerships — in the audiovisual archive sector. The body of agreements that have been made public, the negotiating strategies and tactics through which they were concluded, and the scrutiny and study they since have been subjected

33 Peter B. Kaufman, "Marketing Culture in the Digital Age: A Report on New Business Collaborations Between Libraries, Museums, Archives and Commercial Companies" (New York: Ithaka and Intelligent Television, 2005), online at: http://msc.mellon.org/research-reports/MarketingCultureinDigitalAge-%20Ithaka.pdf/view

34 Quoted in Peter B. Kaufman and Jeff Ubois, "Good Terms: Improving Commercial-Noncommercial Partnerships for Mass Digitisation," D-Lib Magazine 13, No. 11/12 (November/December 2007), online at: http://www.dlib.org/dlib/november07/kaufman/11kaufman.html.

to, all draw out several practical lessons and advisories to which we shall return in the conclusion.[35]

One primary lesson that may have emerged is that the archival community needs to understand what motivates the commercial companies with whom we are working and with whom we may work sooner or later. We need, in short, to understand why Google and companies such as Google do what they do. Google alone has invested, over only a few years, hundreds of millions of dollars in the Google books initiative — by one 2012 estimate, U.S. USD 180 million,[36] a colossal sum! — but why? There have been several estimates as to the actual revenue the company has earned, but few believe it could amount so far to this kind of nine-figure return. Some commentators, seeking to appreciate the activity of a commercial company in kind of a hyper-commercial context, have suggested that Google embarked on the initiative to thwart the ambitions of its putative competitors like Amazon to become

a search engine for books and ideas and words.[37] Yet another more reasonable — and hopeful — explanation for Google's investments in cultural heritage digitisation — and in other fields like mapping, YouTube/video production investments, and more — is that the company is seeking to improve search, not so much against particular rivals but just to make the search experience better and richer, and in the process more lucrative for itself.

Futurologist Kevin Kelley has described it well. As we digitise all of our cultural heritage materials for (to cite the sages' report, The New Renaissance) access, we link our institutions and ourselves together online, and are in fact building one big supercomputer — Kelly calls it a planetary electric membrane — comparable to the individual human brain. It is an organism of collective human intelligence in the business now of processing the hundreds of thousands of full-length feature films we have made, the millions of television shows, the tens of millions of recorded songs, tens of billions of books, and billions of web pages — and looking at the world every day through camera lenses and microphones — 3 billion phones and counting — all recording our own sounds and visions. It is a supercomputer so large that if we think of it as one connected thing, it processes some three million emails every second and each year generates so many Exabytes of data that it consumes 5 per cent of the world's electrical energy. What it wants is . . . more knowledge: increasing sentience or intelligence. And who is writing the software that makes this contraption useful and productive? We are! When we post and tag photos on Facebook, for example, we are teaching the machine to give names to images, and the thickening links between caption and picture form a "neural net" that can continue learning! The 100 billion times per day humans click on one page or another is a way of

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35 Ibid. See also: Richard K. Johnson, "In Google's Broad Wake: Taking Responsibility for Shaping the Global Digital Library," ARL 250 (February 2007), online at: http://www.arl.org/bm~doc/arlbr250digprinciples.pdf; Peter B. Kaufman, "On Building a New Market for Culture: Virtue and Necessity in a Screen-based Economy" (London: JISC, 2009), online at: http://sca.jiscinvolve.org/publications; the work of law professor Jim Grimmelmann, here: http://thepublicindex.org/analysis and here: http://laboratorium.net/archive/2008/11/08/principles_and_recommendations_for_the_google_book; and AMPAS, "The Digital Dilemma 2" (Los Angeles: AMPAS, 2012), online at: http://www.oscars.org/science-technology/council/projects/index.html.

36 http://paidcontent.org/2012/08/06/google-records-show-book-scanning-was-aimed-at-amazon/. Paul Courant, economist, University Librarian, Harold T. Shapiro Professor of Public Policy at the University of Michigan, and Board member of the HATHI Trust and the Digital Public Library of America, has said, "Google has never shared that information or enough data to make a good guess" — and has guessed that it might be as much as USD 480 million. Email correspondence with the author, September 3, 2012.

37 http://paidcontent.org/2012/08/06/google-records-show-book-scanning-was-aimed-at-amazon/
The publisher of this interpretation, Paidcontent.org, is owned by Microsoft. By this light it is conceivable that Microsoft, which owns search engine Bing, and which has engaged in significant investments of its own in digitisation, may be promoting this idea for a reason.

teaching the web what we think is important. Each time we forge a link between words, we teach it an idea. We may think we are merely wasting time when we surf mindlessly or blog an item, but each time we click a link we strengthen a node somewhere in the supercomputer's mind. Author Daniel Soar has put it simply. "Google is learning, . . . We teach it while we think it is teaching us . . . Every search for information is itself a piece of information Google can learn from."[38]

Whatever their reasons, Google and the Googles of this world (let us call them together, Google Plus) continue to invest, and the library, archive, and museum community remains oddly passive in the process — a Kyrgyz village girl, swaddled still and awaiting abduction and marriage, fatalistic in her family yurt. There has been, to date, little in the way of collective action among cultural heritage community members crafting approaches on behalf of the sector toward Google Plus. No agent has been retained to represent the interests of libraries, archives, and museums, in the way an author or musician might retain one. No lawyers have been hired to pore over the body of agreements to date and highlight best practices for the community. No working group focused exclusively on improving public-private partnerships has been assembled and charged with a mission and a deadline. If the commercial sector is investing hundreds of millions of Euros, and a hundred billion are needed, we had better get started.

LEARNING FROM BUSINESS

Moving image archivists from 10 countries whom we interviewed for this project note that the field of late has been pursuing all six kinds of public-private partnerships for revenue generation — and other forms, both traditional and non-traditional, besides. Archives large and small have been pursuing footage licenses for decades — the BBC's and INA's work with the BBC Motion Gallery, administered through BBC Worldwide) and INA MediaPro, for example, being long-time leaders in the field. Focused trade associations such as the Federation of Commercial Audiovisual Libraries (FOCAL) and the Association of Commercial Stock Image Licensors (ACSIL) have helped to coordinate standards and practices. Archives also have been working with vendor partners and agencies — Getty Images and Alexander Street Press, for example — to market their moving image holdings to institutional buyers such as libraries as well as to retail consumers including independent filmmakers. While no one European AV archive has hit upon perhaps the most innovative revenue-generation strategy in the cultural heritage sector — the Getty Institute's car-parking fees, which amount now to over USD 6 million per annum[39] — the field continues to generate significant revenue in innovative ways.

Audiovisual archives can, in their turn, also seek sentience from examining how commercial companies behave with our content, much in the same ways that Google and others who are building businesses like advertiser-driven search engines learn from working with the holdings that audiovisual archives have so dearly maintained over the decades. The challenge is partly a mind-set issue. As one European public archive administrator told us, "In this company, the archive is still not considered an asset." If, as we posit here, through perhaps a bit of Jesuitical casuistry, all audiovisual content becomes, at at least one point in its lifecycle, archival audiovisual content, then every commercial company dealing with film and television and online video — television networks, Amazon, Hulu, Netflix, YouTube — is generating

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38   Kevin Kelly, What Technology Wants (New York: Viking/Penguin, 2010) and Daniel Soar, "It Knows," London Review of Books 33, No. 19 (October 6, 2011), online at: http://www.lrb.co.uk/v33/n19/daniel-soar/it-knows. This is also the point of the highest-grossing film of all time, "Avatar." Set in the future, the Na'avi people plug into and connect with the sounds of the past — they make 'zahaylu' — to heal and enlighten themselves.

39   http://www.laobserved.com/archive/2012/09/getty_takes_in_6_million.php

revenue, whether it's direct or indirect revenue, from once and future archival audiovisual content. Archivists can learn from them all! Producers, archivists, distributors, investors are all, in one form or another, handling the same material at different stages in its lifecycle. And because more than one archive — INA in France, Cinecitta Luce in Italy, for example — have begun working in partnership with Google (and others with others), the field as a whole has been plunged into these types of businesses. Some, looking ahead, are excited. "This is the future of broadcasting," said one archive director. "This is the future of the audience."

Take Amazon. Amazon has created a content ecosystem for audiovisual works through its purchases of Alexa, Audible, the Internet Movie Database (IMDB), and other investments to the point that a user can search, discover, purchase, comment, and socialize — with the worldwide web as well as with other customers — without ever having to leave the website. This is a demonstration of value to us all.

Amazon also fields a search optimisation widget — the Amazon Betterizer — as a "tool" to deliver customized product recommendations instantly. The math involved in the search and recommendation engines at the heart of these companies is daunting. What the company is doing here is learning — learning much as Google learns from behaviour at www.google.com — from user activity in its own ecosystem.[40]

When Amazon posts for sale audiovisual assets that it is publishing in a joint venture with the U.S. National Archives, it prompts customers to consider additional/complementary audiovisual material, and it encourages customers to review these films — of World War II and the like — and posts those review online, gradually building "your watch list" and "your video library" for you and — importantly — for it!

The National Archives is one of several Amazon content partners who have partnered with this bookseller and retail powerhouse to digitise and sell archival content.[41] To what degree are the National Archives monitoring these kinds of data developments, receiving reports on them, and making use of them in its own presentations of self? This kind of feedback for optimizing user engagement is perhaps as valuable as the money that Amazon is investing in NARA digitisation. Amazon's July 2012 announcement of a digital media development centre built largely to focus on audiovisual media offerings at LoveFilm and Pushbutton[42] was not unnoticed by the community. "We would give our eyeteeth to have Amazon's capabilities, user understanding, the whole caboodle," one archivist and librarian told us. "We'd like to borrow it all, wholesale!"

Likewise, Getty. Where Amazon has the Betterizer, Getty has Catalyst — an interactive image search tool to help brainstorm and "search beyond expectations." The depth and degree of metadata at Getty exceeds that of any non-commercial archive in its detail, with entries for, among others,

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40 As Daniel Soar has explored, Google has over 200 signals in its Page-Rank algorithm. (Daniel Soar, "It Knows," http://www.lrb.co.uk/v33/n19/daniel-soar/it-knows.) IMDB's formula has been unpacked as follows: $Rv + Cm/(v + m)$. Amazon's engine resembles in many ways its competitor Netflix's, which has been studied and even opened to the public to improve upon (http://gizmodo.com/5057203/netflix-to-open-api-and-databases-to-the-public; http://www.technewsworld.com/story/75424.html). But in many ways the Holy Grail of the audiovisual archive sector would be to develop the video equivalent of the music genome at the heart of a company like Pandora. At the heart of Pandora are over 400 individual attributes or "genes" for songs and a complex algo-

rithm for organizing them. Each of the songs in Pandora's database - in 2006, over 400,000 songs over 20,000 artists - has been assessed manually - requiring a minimum of 20 to 30 minutes of assessment per 4 minutes of song. All of which leads one to ask, where is the video genome? And where are audiovisual archivists in developing it?
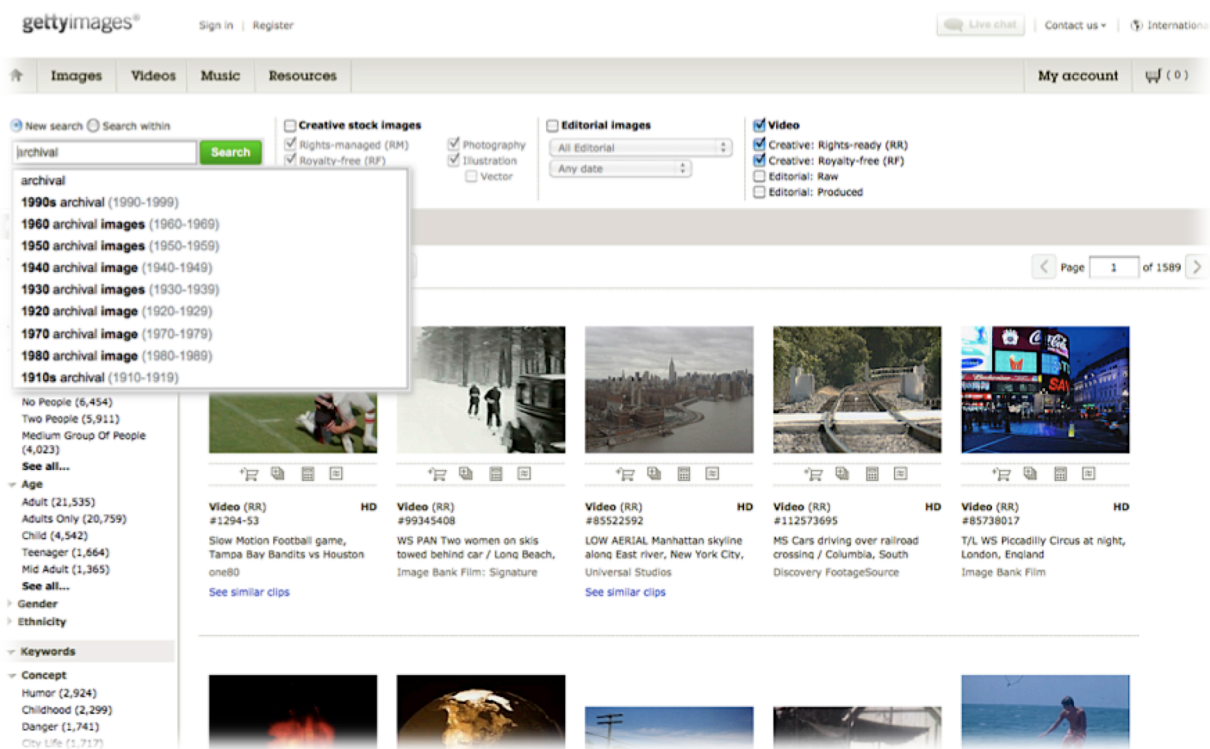
41 http://www.archives.gov/digitization/partnerships.html; http://www.archives.gov/iarchives/

42 http://www.zdnet.com/amazon-makes-london-its-digital-media-development-base-7000001368/; http://techcrunch.com/2012/07/23/amazon-ramps-up-global-expansion-opens-massive-media-rd-center-in-london/

Exhibit 1   NARA presentation at Amazon.com

(Screenshot)

Exhibit 2   Getty Search

(Screenshot)

categories filmmaker, collection, license type, clip length, camera type, delivery options, aspect ratio, shot speed, master file type, color, era, and availability as well as advanced concepts and high-level semantic search — even providing video of search demonstrations for users, which is another rich suggestion for audiovisual archives to consider.

The major domo in the field, and the one that all of our interviewees focused on, is what Google is currently doing with YouTube. To many archivists we talked to, from countries and cultural heritage institutions large and small, YouTube is the destination of choice. Archives "have to be at all the places — YouTube, Facebook, Twitter — where people meet," one European archivist told us. "We think of ourselves as buildings," one archivist and

librarian told us, "but we need a complete change-over in our thinking. We have to be thinking virtually."

YouTube, which has recently invested significant resources — some say hundreds of millions of U.S. dollars — in new partner productions and digitisation initiatives,[43] has developed a sophisticated playbook for its partners. The playbook's recommendations are valuable for any archive, large or small, contemplating putting more audiovisual assets online — replete as they are with sections on optimizing thumbnails, increasing annotations, preferred keywords and metadata, et cetera.

By far the most animation we have witnessed in our interviews with archivists concern the deals

Exhibit 3   YouTube – INA Channel

(Screenshot)

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43   http://www.youtube.com/yt/advertise/original-channels.html
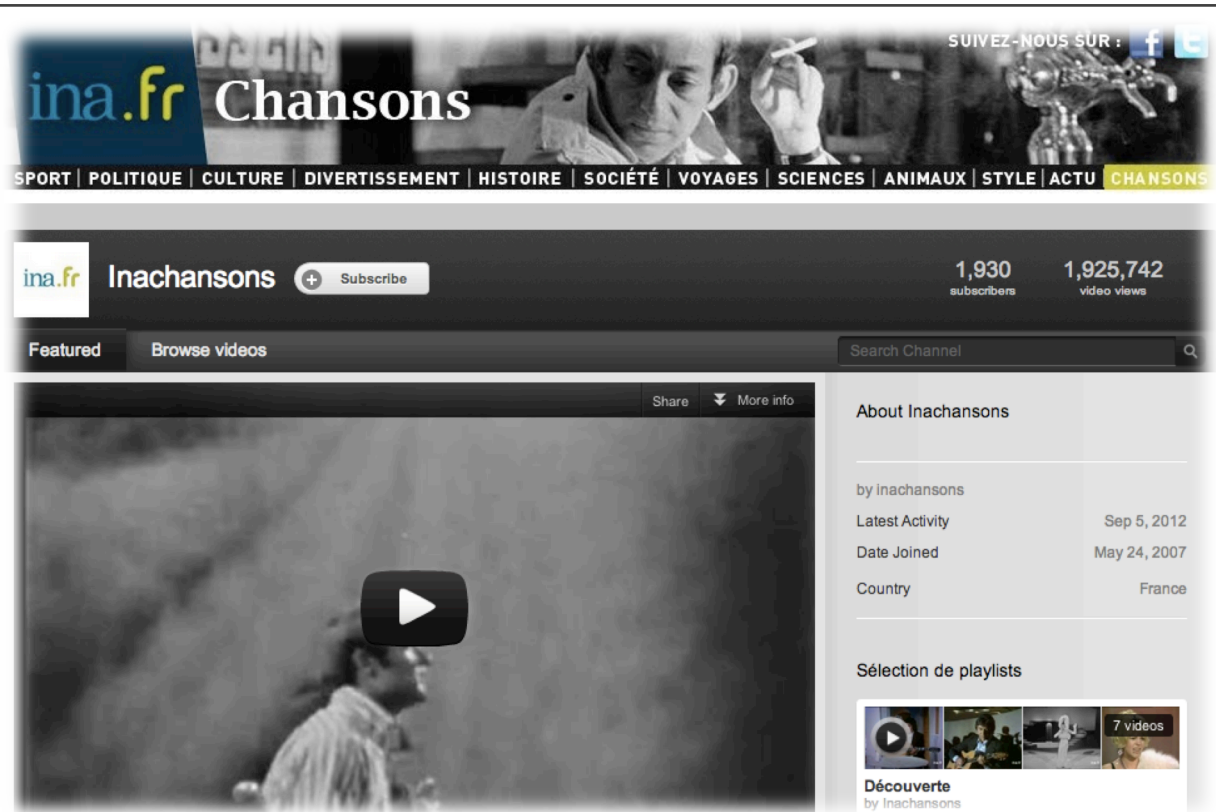
that their archives are making with YouTube. These deals are fresh, and appear to be governed by nondisclosure and confidentiality covenants even if some of the partners are publicly funded cultural institutions. France's Institut National de l'Audiovisuel (INA) and Google announced in March 2012 that 57,000 videos representing 60 years of French television history were being put on YouTube — in INA's words, as part of its public service mission and its vocation to distribute its images online as widely as possible.

Cinecitta Luce and INA announced in July 2012 their project to digitise 30,000 videos also representing decades of Italian cultural history. Cinecitta's director called the deal a "historical, technological, and cultural turning point: Italian and other countries' historical memory [will now be] available to everyone on the most popular online video channel of the world.[44] Other deals have been announced; more are coming.

While the precise terms of these deals are not public, our interviews with moving image archivists suggest that far from money alone — a

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Exhibit 4   YouTube's playbook explains and provides advice to content providers

(Screenshot)

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44   INA and CL press releases - INA dated March 26, 2012, CL
      dated July 5, 2012.

share of the money that Google earns by selling advertising against this material — it is in fact money, Google's technology, and YouTube's know-how that the archives are embracing. Tens of thousands of Euros are being recognized by this content already. One archive administrator told us that YouTube is facilitating the automated export of the archive's painstakingly developed metadata to accompany the assets on the archive's new channel. Google's fingerprinting technology also will enable archives to track use and misuse of audiovisual holdings — facilitating archives to take down or better yet more officially monetise assets that have been put online by others improperly. These lessons that archives will learn in how to reach the public, as well, are neither theoretical nor academic. "The second after we went on YouTube," one archivist from a large institution told us, speaking of his archive's new channel, "we reached an enormous number of people everywhere." Another archive reported manifold increases in web attention from its YouTube channel: "five or ten times" the traffic and attention on its own corporate website.

"It was absolutely a benefit," said another." "I would encourage others to do the same," said yet another, "our field's paranoid and fetishist attitude toward our holdings notwithstanding."

Lessons from these collaborations are likely to be specific. YouTube offers guidelines on how best to optimise metadata for archival video and how best to optimize thumbnails, improve annotations on the moving-image media, structure playlists, and build channel pages, among other focal areas, and provides advisories on reaching audiences with that content, through blogs, and on social media.

In October 2012, YouTube created and released a best practices "playbook" especially geared to educational content and partners from cultural heritage institutions. In sum, from Google and others, there may be broad, strategic lessons from the behaviour of commercial companies that cultural and educational institutions can draw upon for specific ideas and approaches to support their twinned missions of access and preservation.

TOWARDS A NEW SET OF TOOLS
The field of audiovisual archives as a whole would benefit from tools customized for the medium and the profession in order to help those who curate this content appreciate and even maximise the value of these raw and often delicate cultural heritage assets.

The AV Archive Genomic Decoder
One such tool would collect and present what might be called the supreme metadata for appreciating the contents of an audiovisual clip. Such a tool would go beyond currently agreed-upon metadata checklists for digital film and video archivists[45]; it would more closely approach a cross between the video equivalent of the key to the music and audio services Pandora and Spotify — what Pandora calls the music genome — and indeed is exemplified in the decoding of the vast but finite data (the chemical base pairs and genes, all 20,000 of them) in the actual human genome. Commercial services such as RAMP already provide outsourced metadata optimisation solutions for producers and broadcasters,[46] and at the same time research in the academy is proceeding on this topic of the video genome.[47] New signals are being sent by cultural and educational institutions today

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45 Mike Cox et. al., Descriptive Metadata for Television: An End to End Guide (London: Focal Press, 2006); Research Libraries Group, Descriptive Metadata Guidelines for RLG Cultural Heritage Materials (Mountain View, CA: RLG, 2005); and Howard Wachtlar and Michael G. Christel, "Digital Video Archives: Managing through Metadata" (Washington: CLIR, 2002), online at:
http://www.clir.org/pubs/reports/pub106/video.html

46 "RAMP's patented MediaCloud technology was developed from 20 years and $100MM in government R&D in the field of speech recognition, natural language processing, and semantic search. MediaCloud is software-as-a-service that ingests and indexes audio, video, text and image content for its customers, and provides solutions that deliver improved content discovery, user engagement, and monetization of premium content . . . [C]ustomers include Reuters, Comcast/NBC, FoxSports, FoxNews, Dow Jones, Hearst Magazines, and others."

47 See Alexander Bronstein et al., "The Video Genome," arXiv, March 30, 2010, online at: http://arxiv.org/abs/1003.5320

about creating research about a Pandora for artwork worldwide and a Spotify for books online.[48] A roundtable should be assembled by the audiovisual archival community in order to assess how best to draw up plans for a Pandora for audiovisual assets.

At the heart of Pandora are over 400 individual attributes or "genes" for songs and a complex algorithm for organizing them. Each of the songs from Pandora's database — in 2006, over 400,000 songs over 20,000 artists — has been assessed manually — requiring the company's operators to spend a minimum of 20 minutes of assessment per 4 minutes of song. The benefits of such efforts to catalogue, classify, and tag our holdings — more or less traditional roles in the field — stretch across search engine optimisation to monetisation. "Aside from the obvious and vital role of closed captioning for accessibility of programming, there is also a business benefit in closed captioning. Content optimisation platform Ramp has said that the use of tags and transcriptions in Web video can drive engagement rates anywhere from 40% to 300%. What's more, that same metadata, text and information that accompanies a video can also be mined for ad targeting, so that marketers can better match the content of video with the products being peddled. Better tagging can also boost video SEO, which leads to more views."[49]

YouTube has developed an automatic keyword generator for partners to enhance their own tagging campaigns, which is more of a living thesaurus with a controlled vocabulary than it is an app or genius piece of software. The AV Archive Genomic Decoder could provide such keywords as an ancillary benefit.

The Openometer Use-A-Tron

A number of the archivists we interviewed for this white paper and many cultural heritage professionals and educators active in the field often advocate that open-access policies should govern educational material that is essentially textual — and some are keen to apply so-called open content metrics to audiovisual materials as well. Yet at the dawn of the second century of film, only a small percentage of audiovisual materials is available without any restriction at all on use for the end user.

Print publishers, who are about 300 years ahead of audiovisual in terms of field development, at least calendrically speaking, have developed a guide to journals that are part of the open access movement, loosely defined, in an effort to determine whether a publishing asset is truly free (as in libre). The Association of Research Libraries' Open Access Spectrum[50], reproduced overleaf, would do well to have its audiovisual analogue, the Openometer Use-A-Tron, which would measure the manifold assets in a piece of archival footage against a set of absolute standards to chart their place on a spectrum of use and reuse rights internationally.

Such a tool would of be particular value for archives who are concerned that they might be getting snookered through commercial deals into giving away some rights that actually might belong to the public to a publisher, licensor, or distributor of some kind instead — or trading those rights for money or services as they allow some kind of exclusivity of use in the digital item to accrue to their business partner — a process that has been aptly called enclosing or re-enclosing the commons.[51]

48 http://art.sy/;
     http://www.nytimes.com/2012/10/09/arts/design/artsy-is-mapping-the-world-of-art-on-the-web;
     http://www.digitalbookworld.com/2012/e-book-subscription-service-oyster-gets-3-million-in-funding-wants-to-be-spotify-for-books/comment-page-1/

49 http://www.mediapost.com/publications/article/178726/video-metadata-boosts-engagement-four-times-video.html?edition=49010

50 http://www.arl.org/sparc/media/HowOpenIsIt_Final_Guide_Released.shtml

51 James Boyle, The Public Domain: Enclosing the Commons of the Mind (New Haven: Yale University Press, 2008), online at: http://yupnet.org/boyle/. See also Pelle Snickars's cautionary tales in "Archival Transitions: Some Digital Propositions," in Kingsley Bolton and Jan Olsson, eds., Media, Popular Culture, and the American Century (Stockholm: KB/John Libbey Press, 2011), online at: http://pellesnickars.se/index.php?s=english

Exhibit 5   The Association of Research Libraries' Open Access Spectrum

Access	Reader Rights	Reuse Rights	Copyrights	Author Posting Rights	Automatic Posting	Machine Readability	Access
OPEN ACCESS	Free readership rights to all articles immediately upon publication	Generous reuse & remixing rights (e.g., CC BY license)	Author holds copyright with no restrictions	Author may post any version to any repository or website	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) immediately upon publication	Article full text, metadata, citations, & data, including supplementary data, provided in community machine-readable standard formats through a community standard API or protocol	OPEN ACCESS
	Free readership rights to all articles after an embargo of no more than 6 months	Reuse, remixing, & further building upon the work subject to certain restrictions & conditions (e.g., CC BY-NC & CC BY-SA licenses)	Author holds copyright, with some restrictions on author reuse of published version	Author may post final version of the peer-reviewed manuscript ("postprint") to any repository or website	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) within 6 months	Article full text, metadata, citations, & data, including supplementary data, may be crawled or accessed through a community standard API or protocol	
	Free readership rights to all articles after an embargo greater than 6 months	Reuse (no remixing or further building upon the work) subject to certain restrictions and conditions (e.g., CC BY-ND license)	Publisher holds copyright, with some allowances for author and reader reuse of published version	Author may post final version of the peer-reviewed manuscript ("postprint") to certain repositories or websites	Journals make copies of articles automatically available in trusted third-party repositories (e.g., PubMed Central) within 12 months	Article full text, metadata, & citations may be crawled or accessed without special permission or registration	
	Free and immediate readership rights to some, but not all, articles (including "hybrid" models)	_____	Publisher holds copyright, with some allowances for author reuse of published version	Author may post submitted version/draft of final work ("preprint") to certain repositories or websites	_____	Article full text, metadata, & citations may be crawled or accessed with permission	
CLOSED ACCESS	Subscription, membership, pay-per-view, or other fees required to read all articles	No reuse rights beyond fair use/ limitations & exceptions to copyright (all rights reserved copyright) to read	Publisher holds copyright, with no author reuse of published version beyond fair use	Author may not deposit any versions to repositories or websites	No automatic posting in third-party repositories	Article full text & metadata not available in machine-readable format	CLOSED ACCESS

Source: http://www.plos.org/wp-content/uploads/2012/10/OAS_English_web.pdf

In 2011 the Film & Sound Think Tank of the British funding agency JISC released a series of recommendations for educators keen to use more moving image and sound assets in higher and further education. There are multiple layers of rights to content in a single minute of moving image content; perhaps as many as 200 content items licensed or licensable in a given hour:

> "Rights-holders and other stakeholders in the success of television and online video content can include producers, directors, cinematographers, cameramen, film and video editors, writers of scripts, writers of songs, writers of music, actors, singers, musicians, dancers, choreographers, narrators, and animators, as well as whole worlds of content similar in complexity from music and book publishing and the film business who may have sold or otherwise licensed rights to the production — to say nothing of the dozens and sometimes hundreds of artists, designers, engineers, consultants, and staff who are often rewarded when they help productions to complete the journey from idea to finished work."

> "As the demand for online audiovisual information in both formal and informal educational settings grows, producers, studios, networks, publishers and others in the business are consumed with the task of contacting these stakeholders, often through their agents, lawyers, guilds, and unions, for permission to make this work available online. Licensing this media for websites and other forms of distribution such as games, mobile devices, and textbooks involves satisfying the interests of many of these stakeholders . . ."

> "Preliminary studies of the time required clearing such materials formally and according to copyright and contract law suggest just how unworkable and primitive the clearance system of today truly is — especially when that material was produced before the advent of the Internet. Between 2005 and 2007, for example, the BBC invested 6,500 person-hours to clear a total of 524 hours of BBC footage for its experimental online Open Archive. Extrapolating from these figures, it has been estimated that to clear the entire BBC Archive for online use would take 685 years."

JISC's Film & Sound Think Tank called for educators and archivists to come together to complete an inventory of the elemental anatomy of a video and audio clip requiring rights and licensing attention.[52]

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52 Gerhardt and Kaufman, "Film and Sound in Higher and Further Education," online at:

The Openometer Use-A-Tron builds upon this recommendation. It would list all varieties of digital materials in a given moving image clip and weigh and measure them according to their current use and reuse rights and the use and reuse rights they are likely to carry after they pass through a digitisation process and any contract(s) with a commercial partner. It would constitute a vast chart — on one axis, a matrix of business sectors, as we listed on page 7:

- Internet access: wired and mobile
- Internet advertising: wired and mobile
- TV subscriptions and license fees
- TV advertising
- Recorded music
- Filmed entertainment
- Video games
- Consumer magazine publishing
- Newspaper publishing
- Radio
- Out-of-home advertising
- Consumer and educational book publishing
- Business-to-business

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http://filmandsoundthinktank.jisc.ac.uk/ch4-strategic-recommendations, emphasis added, and Ben Green, "Delivering the BBC Archive: The Rights Challenge, a presentation to the JISC Film & Sound Think Tank, October 29, 2009," online at: www.jisc.ac.uk/whatwedo/programmes/filmandsound. An alternative estimate projected that it would take the BBC 800 people three years of full-time work, "assuming that all rights owners could be found and that everyone was prepared to [promptly] grant the rights." Stephen Edwards, "A Simple Change in the Law Could Open Up Online Access to the BBC's Archives," The Guardian, November 25, 2010, online at: www.guardian.co.uk/law/2010/nov/25/bbc-archive-online-access-law. See also: www.jisc.ac.uk/publications/programmerelated/2009/scaiprtoolkitseniormgt and http://pressandpolicy.bl.uk/imagelibrary/downloadMedia.ashx?MediaDetailsID=563

Within Internet and television the following:

- Basic television (which is also online and mobile)
- Cable television (also pay-per-view[PPV]/video-on-demand [VOD])
- Online commercial entertainment sites
- Online non-commercial educational sites
- Online media streaming sites, e.g., Hulu
- Online media download sites, e.g., iTunes
- Social network sites, e.g., Facebook
- Mobile media players, including mobile phones
- DVD sales sites (turning into video-on-demand [VOD] sites), e.g., Amazon
- Gaming sites and platforms, e.g., Xbox 360
- VOD sites
- Peer-to-peer/files-sharing sites for download
- Content management systems at schools and universities, e.g., Blackboard

And in addition to the above possibly a number of business models, as we listed on page 9:

- Public sponsorship/philanthropy
- Corporate sponsorship/advertising
- User fee-for-service
- Submitter fee-for-service
- Membership/subscription
- Community model
- Endowment
- Services/consulting
- Joint venture between rights holder and archive

On the other axis would be a matrix of rights governed by dozens of contracts and agreements representing thousands, sometimes millions, of dollars of investment and possible pay-outs — perhaps 100 rights and clearance areas that archivists would identify as critical for access clearance in the anatomy of a typical video clip. The com-

plexity of the tool would reflect just how complicated the anatomy of a video clip truly is to the institution that is is safeguarding that clip or to the creator who is seeking to access it or part of its content. The tool could also feature items that are not moving images but part of a larger collection — including documents, images, and other media — being digitised. Most important, it would make explicit the range of rights that are left available for the public — the public value test again — in the wake of a business relationship that intends to digitise the content in question. With full access to audiovisual heritage, as to cultural heritage generally, as the ultimate goal (the moral imperative, in the words of the sages' committee) of its users, the tool would serve to highlight, in each instance of limited access, how much needs to be done in order to fully service that objective.

The AV Asset Evaluator

Another tool that the field could well develop is a lens through which the innate current value of a digital cultural heritage item, even one as complex as a footage clip, could be quickly if approximately assessed. As a report on this topic put it in 2005:

> "Today, any company, any enterprise, and any venture fund with a screen to fill, an engine to search, a pipe to send bytes down, or a chip to sell is a current or potential stakeholder in the digitisation and publication, broadly defined, of scholarship and culture and educational materials".

And the obverse is conceivably true — that every piece of media can be monetised in the digital age.[53]

The innate value of a clip about Christmas,

as one audiovisual curator himself told us, goes up at . . . Christmastime, because that value is a function of contemporary relevance online. Sensible enough — and indeed a factor in the business model of archive sales and licensing operations such as Getty and T3 Media (FKA Thought Equity Motion). An AV Asset Evaluator that could examine trending topics on the web today and layer keywords from such topics onto the basic descriptive metadata about the contents and rights provenance of a piece of footage could help alert audiovisual archives to the potential for monetizing its own assets. YouTube itself encourages its partners to search the web for trending topics as they determine what to publish online when.

One audiovisual archive whose administrator we interviewed indicated that he has been developing a yearly calendar of "outside" events (from holidays on) which help trigger what digital content he will feature on the archive's public-facing portals and its YouTube page and social media platforms. This is second nature to commercial organisations but not necessarily so for archives. How could the field take a piece of audiovisual archive content floating around the web and see how much money has been generated off of it or against it through sales, licensing, advertising, and then map that valuation against a virgin piece of newly digitised material to see how much value can be earned or added by that new clip in a given period of time?[54]

In many ways this too is a holy grail for all publishers, not just for audiovisual archives. Posting material on the web in 2012 means giving it away in many aspects, as every digital-rights-management technology will be hacked, and copying costs are zero. Could there be some kind of digital homing device, like marine biologists

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53 Peter B. Kaufman, "Marketing Culture in the Digital Age: A Report on New Business Collaborations Between Libraries, Museums, Archives and Commercial Companies" (New York: Ithaka Harbors, 2005), online at: http://msc.mellon.org/research-reports/MarketingCultureinDigitalAge-%20Ithaka.pdf/view; and John Unsworth et al., Our Cultural Commonwealth: The Report of the ACLS Commission on Cyberinfrastructure for the Humanities and Social Sciences (New York: ACLS, 2006), online at: http://www.acls.org/programs/Default.aspx?id=644.

54 These tools would fit well in the family of emerging tools from PrestoCentre, including the PrestoSpace Storage Calculator (http://prestospace-sam.ssl.co.uk/hosted/d12.2/calc4.php) which helps archivists estimate how much data they will have once they have converted an analogue collection to digital files, and the PrestoSpace Preservation Project Cost Calculator (http://prestospace-sam.ssl.co.uk/hosted/d13.2/newcalc.php), which provides rough estimate of costs for for film, audio, and video digitisation projects.

shoot into the fins of dolphins, that could track our content across the web, and sense each time a copy or a derivative work is spawned? Could there be a smart or semantic watermark that could not only return intelligence about use to the creator or original curator of a piece of audiovisual content, but also somehow track how much money has been earned by that content through advertising and sales?[55] Is there a way of encouraging the crowd/the public to participate, much as initial tagging games from Dutch Sound and Vision have done?[56]

Hard to imagine — but then, we have three-dimensional printers that print skin and prostheses, and we have landed a robot on the planet Mars that is controllable in real-time from Earth. YouTube (again) is generating the capability to scour the web for archival content that already has been put online, illegally or improperly, and retroactively brand, tag, and claim that content in the name of the original rightsholder. In other words, instead of taking down content, the punishment of choice in recent years, archives and others will soon have the possibility of leaving that content up but branding and monetizing it — through a fingerprinting and watermarking technology Google continues to enhance called Content ID[57].

The Audiovisual Asset Playbook
A fourth tool that the archival community could benefit from is an entire best practices playbook, on the model of YouTube's playbook for its content partners. This would be a comprehensive document — and, like YouTube's, continually

Exhibit 6   YouTube Playbook Table of Contents

(Screenshot)

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55 The French INA has had fingerprinting technology implemented on Daily Motion since 2008
   http://mashable.com/2008/02/25/dailymotion-finalizes-ina/
   http://www.institut-national-audiovisuel.fr/en/products-services/signature.html

56 See the Dutch Waisda game, described here:
   http://www.archivesnext.com/?p=1557 and also
   http://framescinemajournal.com/movietaggeralpha

57 http://www.youtube.com/t/contentid

updated — providing common-denominator information for archives large and small to optimize their content for searchability and possibly marketability online. YouTube's Partner Playbook describes how best to optimize metadata, thumbnails, annotations, playlists, and channel pages, among other focal areas, and provides advisories on reaching audiences with that content, through blogs, and on social media. This report we hope serves as the foundation of such an initiative. As archives develop and deepen their relationships with YouTube and others, a new Audiovisual Asset Playbook could include guidelines for decision-making, annotated samples of public-private contracts that archives and their partners make available, annotated samples of revenue reports, and more.

RECOMMENDATIONS

The work of audiovisual archives with the private sector, in geological time at least, has only just begun. Because of the significant value that these archives represent, because the commercial partners (companies such as Google and Apple) have never been, as a class, on stronger footing, and because these kinds of partnerships have been in play for years in the print and image world, opportunities abound for crafting even better working relationships to mine the raw materials of creativity for the 21st century. In 2007, during the heady start of private investment in mass digitisation of these heritage materials, philanthropies and cultural institutions in the United States began collaborating on analysis and information-sharing — toward assembling best practices for the benefit of cultural heritage custodians, and perhaps for private sector representatives, too, who did not quite understand how libraries, archives, and museums often function (or mire themselves in dysfunction). A report on mass digitisation prepared for the cultural heritage sector recommended that public institutions weighing relationships with the private sector consider a set of recommendations — and perhaps the process of recommending things to the sector from somewhere unofficial within it was born. . . [58]

Many groups stake claims to represent the collective interests of moving image archives. Among them are the PrestoCentre Foundation — for archives invested in digitisation and digital preservation; the Association of Moving Image Archivists concentrating on U.S. based archives; the International Association of Sound and Audiovisual Archives (IASA) that is specialised in sound archiving; the Federation of Commercial Audiovisual Libraries (FOCAL); the Association of Commercial Stock Image Licensors (ACSIL); the International Federation of Television Archives (FIAT/IFTA); and the European Broadcasters Union (EBU). The range and number of these institutions notwithstanding, more wisdom and input always remains necessary as the field of

58   Kaufman and Ubois, "Good Terms: Improving Commercial-Noncommercial Partnerships for Mass Digitization," at: http://www.dlib.org/dlib/november07/kaufman/11kaufman.html.

audiovisual archives confronts the huge mandate of digitisation for preservation and access — perhaps its largest collective challenge ever.

This Report puts forward seven recommendations for the field:

[1] Audiovisual archives should consider themselves part and parcel of the knowledge economy.

While organisations such as Apple, Netflix, and Google have enormous market capitalisation or value — as of September 27, 2012, USD 639 billion, USD 3 billion, and USD 270 billion, respectively — the amounts of money that national governments and multilateral organisations and publics have invested in cultural heritage institutions are roughly on the same scale. Cultural institutions themselves represent cumulatively billions of dollars of investment, based on the value of their assets and decades of collecting, curating, and preserving physical copies of these works. Indeed, the computation remains to be made about the size of the investment, loosely defined, that audiovisual archives have made already in this market, from cash to infrastructure, from know-how to goodwill.

[2] Audiovisual archives should recognize that multibillion-dollar businesses are growing — even thriving now — based on materials they curate; and as a result their institutions deserve to participate in the revenue these materials are generating, in the knowhow that they are contributing, and in other direct and indirect benefits these materials are making to the world.

The commercial enterprises that are producers and co-producers of screen-based media are relatively new at their work; cultural and educational institutions have been around as long or longer, have much wisdom to share with them, and much value collectively to bring to the table.

[3] As they stand today poised on the edge of broad and deep collaboration with the private sector, audiovisual archives more than anything need something approximating an old-fashioned guild, where collective

knowledge can come to rest, and where business savvy from attorneys, dealmakers, and others might be fielded and centralized.

Whether through the trade associations above or another newer entity, practical advice needs to be marshalled and made available to archives and cultural heritage professionals from countries of all sizes and shapes.

[4] The field needs to hire, in effect, an advocate — perhaps a sanhedrin of wise men and women who can look after its collective interest and help it argue on its own behalf and on behalf of the public sector.

In fact, with the assets that it has — the breadth, depth, and value of those assets — the field needs an agent, someone who seeks deals on its members' behalf rather than reacts to processes initiated in the private sector. Audiovisual archives could address themselves to particular sponsors and partners for digitisation programs — much as television producers, filmmakers, and video producers pitch ideas for their screen-based media.

[5] When approaching business relationships, audiovisual archives should consider the arrangements from the perspective of their commercial partners, recognizing that the strongest players in the audiovisual marketplace are in the business now for the long term, making strategic rather than tactical investments in the sector.

Commercial companies seek returns on their investments in mass digitisation based on various financial calculations including:

- effects on near-term revenue;
- effects on closing future deals that in turn may bring in additional future revenue;
- effects on corporate profit;
- effects on closing future deals that may bring additional profit; and
- effects on company valuation.

These calculations may tend to be more short-term than those of cultural and educational institutions,

but owing the financial stability of many of the key commercial players, they are longer-term in nature than they ever have been.

[6] Archives should recognize in particular the value of their building comprehensive metadata resources and optimizing their audiovisual resources for search and discovery.

The 2007 study noted that investment banks and management and strategy firms that appraise and influence the valuation of the sector's business partners are paying increasing attention to new ways of measuring value in the online world. Rendering content searchable, findable, or what some call "computably competitive," may be as good an investment of resources, if not better, as simply making more content available.

[7] In the audiovisual archive world, archives have been dealt a strong hand. They need to recognize that audiovisual material now and over time will be the most sought-after assets to monetise.

It would behove the community — and especially the national and international funders that support it — to convene a working group specifically on the topics covered in this paper in order to take them forward in a structured, systematic way with good advisors from all sides.

In sum, audiovisual archives now have to think of themselves as part of the audiovisual industry writ large. They have to think of themselves as primarily online institutions — addressing an online market and user base that is present everywhere and every minute. They have to maximise — in an environment already highly competitive for attention — their own public appeal. They have to watch and learn how their content is used on the web. They have to enhance their ability to be seen, found, and properly valued by a market that comprises no less than billions of people worldwide.

CONCLUSION

In this second century of film, we can look back 100 years at 1912, say, when film and moving images were in their infancy, and see that many things about their production, distribution, and display were different. Many things, we can note, were the same — many early films were short, produced for collective enjoyment, designed to be commented on in public and often — surprisingly, perhaps — revised and remixed.[59] It may be too early to say it, but quite possibly the past decades that have privileged the long-form consumption of elaborate productions in silent theatres will prove to be the aberration rather than the rule for our interaction with the moving image. The next hundred years may feature the type of interaction that marked the beginning of the medium.

That interaction will take place, as numerous archivists repeatedly told us, over computer monitors and mobile devices more so than on distant screens. It will be an interaction that will feature not only the moving image aspects of a moving image archive, but every part of that archive delivered together — scripts, stills, correspondence: a whole range of text and image files alongside the audio and video. It is this more comprehensive picture of history that archives are serving up — which is to say, not just the history of television, for example, important as that is, but the history of a time, or of a thing like architecture, fashion, or sports. The history that is told through television, in turn, will appear on aggregated sites such as Europeana and Wikipedia — which is to say not on sites about television, or sites that focus on the moving image per se, but in portals that integrate art, text, film and sound together, without privileging one medium or the other. Indeed the future of the digitisation agenda in this, the second century also of audiovisual archives, will be determined by the requirements of large-scale non-commercial aggregators and commercial business partners as much as by local institutional needs and

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59   http://www.wcftr.commarts.wisc.edu/collections/featured/ aitken/1910s/; http://www.filmsite.org/1912-filmhistory.html; and Douglas Gomery, Shared Pleasures: A History of Movie Presentation in the United States (Madison: University of Wisconsin Press, 1992).

preferences.

Content that is being produced digitally today is finding its way online one way or another — by innovative partnerships especially.[60] Media is critical to our future — and no media more than moving images and the heritage of our past. The business of moving images online marches forth with lightning speed — YouTube alone, it is estimated, will earn USD 4 billion from advertising in 2012, that revenue representing 50 per cent growth from 2011.[61] While this report has focused on the worth of audiovisual assets in largely monetary terms, the true value of our history, memory, and self-knowledge ultimately cannot be measured by such a metric. We use this metric as an instrument for this paper because money — and much of it, as we note — is needed now to put our cultural heritage online. Cultural heritage cannot really be valued in monetary terms. Its value — like the value of our children: the value of our future — is priceless.

* * *

REFERENCES

Addis, Matthew et al (2010) "100 Million Hours of Audiovisual Content: Digital Preservation and Access in the PrestoPRIME Project." PrestoPrime. http://eprints.soton.ac.uk/271071/.

Adhikari, Richard (2012) "Netflix Circles the Wagons Around its API." TechNewsWorld, 20 June 2012. http://www.technewsworld.com/story/75424.html.

"American Cinema in the 1910s." Wisconsin Center for Film and Theater Research. http://www.wcftr.commarts.wisc.edu/collections/featured/aitken/1910s/.

American Council of Learned Societies Commission (2006) Our Cultural Commonwealth: The Report of the ACLS Commission on Cyberinfrastructure for the Humanities and Social Sciences. New York: ACLS. http://www.acls.org/uploadedFiles/Publications/Programs/Our_Cultural_Commonwealth.pdf.

Bronstein, Alexander M, Michael M. Bronstein, and Ron Kimmel (2010) "The Video Genome." arXiv, 30 March 2010. http://arxiv.org/abs/1003.5320.

Carter, Bill (2012) "All the TV News Since 2009, on One Web Site." NYT, 17 September 2012. http://www.nytimes.com/2012/09/18/business/media/internet-archive-amasses-all-tv-news-since-2009.html?_r=0.

Central Intelligence Agency. The World Factbook. https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html.

Cisco (2012) Cisco Visual Networking Index: Forecast and Methodology, 2011-2016. http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ ns705/ ns827/ VNI_Hyperconnectivity_WP.html.

— The Zettabyte Era. http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ ns537/ns705/ns827/white_paper_c11481360_ns827_Networking_Solutions_White_Paper.html.

Covert, Adrian (2008) "Netflix to Open API and Database to the Public." Gizmodo, 30 Sep-

---

60 http://www.nytimes.com/2012/09/18/business/media/internet-archive-amasses-all-tv-news-since-2009.html?_r=0; http://www.cpb.org/pressroom/release.php?prn=985

61 http://www.nypost.com/p/news/business/videos_to_go_at_tube _JyhZSGHvMZxSwOHzaQIZsO

tember 2008. http://gizmodo.com/5057203/netflix-to-open-api-and-databases-to-the-public.

Cox, Mike, Ellen Mulder, and Linda Tadic (2006) Descriptive Metadata for Television: An End to End Guide. London: Focal Press.

CPB (2012) "The Corporation for Public Broadcasting Convenes Advisory Panel to Guide Development of the American Archive." CPB Media Room, 19 September 2012. http://www.cpb.org/pressroom/release.php?prn=985.

European Commission (2010) Green Paper: Unlocking the Potential of Cultural and Creative Industries. Brussels. http://ec.europa.eu/culture/our-policy-development/doc/GreenPaper_creative_industries_en.pdf.

— (2011) The New Renaissance: The Report of the Comité des Sages Reflection Group on Bringing Europe's Cultural Heritage Online. Brussels: European Commission. http://ec.europa.eu/information_society/activities/digital_libraries/doc/refgroup/final_report_cds.pdf

— (2011) Commission Staff Working Paper Accompanying the document

Commission Recommendation on the Digitisation and Online Accessibility of Cultural

Material and Digital Preservation. Brussels: European Commission. http://ec.europa.eu/information_society/activities/digital_libraries/doc/recommendation/staffworkingpaper1274final.pdf.

— — (2011) Open Data: An Engine for Innovation, Growth and Transparent Governance. Brussels: European Commission. http://ec.europa.eu/information_society/policy/psi/docs/pdfs/directive_proposal/2012/open_data.pdf.

Filmsite. Timeline of the Greatest Film Milestones and Turning Points in Film History. http://www.filmsite.org/1912-filmhistory.html.

Galmarley. "Gold : Prices, Facts, Figures & Research." http://www.galmarley.com/framesets/fs_commodity_essentials_faqs.htm.

Gomery, Douglas (1992) Shared Pleasures: A History of Movie Presentation in the United States. Madison: University of Wisconsin Press.

Harvey, Claire (December 2011) "Making Money from AV Archive Content" PrestoCentre Blog. http://www.prestocentre.org/blog/making-money-av-archive-content.

— (2010) The Global Trade in Audio-Visual Archives. London: Screen Digest, FOCAL International, and FIAT/IFTA. http://www.screendigest.com/reports/201074c/10_08_the_global_trade_in_audio_visual_archives/view.html and http://www.focalint.org/industry-news/news/243/audio-visual-archives-see-opportunities-for-growth.

IBM, "Smarter Planet." http://www.ibm.com/smarterplanet.

JISC Film and Sound Think Tank (2010) Knowledge Is…, (11 minutes) available in Paul Gerhardt and Peter B. Kaufman (2011) Film and Sound in Higher and Further Education: A Progress Report with Ten Strategic Recommendations. JISC. http://filmandsoundthinktank.jisc.ac.uk/ch1-introduction.

John Roberts, Jeff (2012) "Google Records Show Book Scanning was aimed at Amazon." paidContent, 6 August 2012. http://paidcontent.org/2012/08/06/google-records-show-book-scanning-was-aimed-at-amazon/.

Johnson , Richard K. (2007) "In Google's Broad Wake: Taking Responsibility for Shaping the Global Digital Library." ARL 250, February. http://www.arl.org/bm~doc/arlbr250digprinciples.pdf.

Kaufman, Peter B. (2005) "Enabling Creativity: The User Experience." Speech transcript available at http://www.bbc.co.uk/creativearchive/news/archives/2005/04/ transcript_pete_1.shtml.

— (2005) Marketing Culture in the Digital Age: A Report on New Business Collaborations Between Libraries, Museums, Archives and Commercial Companies. New York: Ithaka and Intelligent Television, 2005. http://msc.mellon.org/research-reports/MarketingCultureinDigitalAge-

%20Ithaka.pdf/view.

— (2009) On Building a New Market for Culture: Virtue and Necessity in a Screen-based Economy. London: JISC. http://sca.jiscinvolve.org/publications.

Kaufman, Peter B. and Jeff Ubois (2007) "Good Terms: Improving Commercial-Noncommercial Partnerships for Mass Digitisation." D-Lib Magazine 13, No. 11/12, November/December 2007. http://www.dlib.org/dlib/november07/kaufman/ 11kaufman.html.

Kelly, Kevin (2010) What Technology Wants. New York: Viking/Penguin.

Klijn, Edwin and Yola de Lusenet (2008) Tracking the Reel World: A Survey of Audiovisual Collections in Europe. Amsterdam: European Commission on Preservation and Access. http://www.tape-online.net/survey.html.

"List of Countries by Natural Gas Proven Reserves." Wikipedia. http://en.wikipedia.org/wiki/List_of_countries_by_natural_gas_proven_reserves. Accessed, August 2012.

Lunden, Ingrid (2012) "Amazon Ramps Up Global Expansion, Opens Massive Media and R&D Center in Lonon." TechCrunch, 23 July 2012. http://techcrunch.com/2012/07/ 23/amazon-ramps-up-global-expansion-opens-massive-media-rd-center-in-london/.

McVeigh-Schultz, Joshua (2012) "Movie Tagger Alpha: Critical Tagging in Emerging Methods of Media Scholarship." Film and Moving Image Studies Re-Born Digital? http://framescinemajournal.com/movietagger alpha.

Meyer, David (2012) "Amazon Makes London its Digital Media Development Base." Zdnet, 23 July 2012. http://www.zdnet.com/amazon-makes-london-its-digital-media-development-base-7000001368/.

National Archives, "Digitisation Partnerships." http://www.archives.gov/digitisation/partners hips.html.

— "Footnote and the National Archives." http://www.archives.gov/iarchives/.

Nation Master. "Energy Statistics > Oil Reserves (Most Recently) By Country." http://www.nationmaster.com/graph/ene_oil _res-energy-oil-reserves.

Numeric — Statistics on Digitisation of Cultural Materials in Europe" (2009). London: Chartered Institute of Public Finance and Accountancy. http://cordis.europa.eu/fp7/ict/telearn-digicult/numeric-study-appendices_en.pdf

"Oil Reserves." Wikipedia. http://en.wikipedia.org/wiki/Oil_reserves. Accessed August 2012.

Oomen, Johan and Roeland Ordelman (2011) "Accessing Audiovisual Heritage: A Roadmap for Collaborative Innovation." IEEE Multimedia 18, no. 4, Oct.-Dec. pp. 4-10.

Phillips, Stephen (2010) Service Level Agreements for Storage and Preservation. PrestoCentre. http://www.prestocentre.org/library/resources /service-level-agreements-storage-and-preservation.

Poole, Nick (2010) The Cost of Digitising Europe's Cultural Heritage: A Report for the Comité des Sages of the European Commission. London: The Collections Trust. http://ec.europa.eu/information_society/activi ties/digital_libraries/info_centre/cultural/inde x_en.htm.

Puttnam, Lord David of Queensgate, CBE (2005) "The Creative Archive." Speech transcript available at http://www.bbc.co.uk/creativearchive/news/ar chives/2005/04/transcript_lord_1.shtml.

Preserving Digital Public Television. http://www.thirteen.org/ptvdigitalarchive/

"Principles and Recommendations for the Google Book Search Settlement." The Laboratorium, 8 November 2008. http://laboratorium.net/archive/2008/11/08/ princi-ples_and_recommendations_for_the_google_ book

PwC (2012) "Global Entertainment and Media Outlook, 2012-2016." New York: PwC. Information avavilable online at: http://www.pwc.com/us/en/industry/entertai nment-media/publications/global-entertainment-media-outlook.jhtml.

Research Libraries Group (2005) Descriptive Metadata Guidelines for RLG Cultural Heritage Materials. Mountain View, CA: RLG.

http://www.oclc.org/resources/ research/activities/culturalmaterials/RLG_desc_metadata.pdf.

Roderick, Kevin (2012) "Getty Takes in USD 6.4 Million in Parking a Year." LA Observed, 11 September 2012. http://www.laobserved.com/archive/2012/09/getty_takes_in_6_million.php.

Science & Technology Council, The of the Academy of Motion Picture Arts and Sciences (2012) The Digital Dilemma 2. Los Angeles: AMPAS. http://www.oscars.org/science-technology/council/projects/index.html.

Soar, Daniel (2011) "It Knows." London Review of Books 33, No. 19, 6 October 2011. http://www.lrb.co.uk/v33/n19/daniel-soar/it-knows.

Sonne, Paul and Keach Hagey (2012) "Across Pond to New York." Wall Street Journal, August 16, 2012. http://online.wsj.com/article/SB10000872396390444233104577591663216386018.html.

Snyders, Marius, Hans Westerhof, and Jeff Ubois (2011) "Financial Models and Calculation Mechanisms" PrestoCentre. Available at http://www.prestocentre.org/library/resources/financial-models-and-calculation-mechanisms.

Stroeker, Natasha and René Vogels (2012) Survey Report on Digitisation in European Cultural Heritage Institutions 2012. Amsterdam: Panteia on behalf of the EUMERATE Thematic Network. http://www.enumerate.eu/fileadmin/ ENUMERATE/ documents/ ENUMERATE-Digitisation-Survey-2012.pdf.

Terlep, Sharon and Ryan Dezember (2012) "Carlyle Group Sets Deal to Buy Getty Images." Wall Street Journal, 15 August 2012. http://online.wsj.com/article/SB10000872396390444375104577590812532175058.html.

Theimer, Kate (2010) "Winners: Best Use of Crowdsourcing for Description." Archives Next, 6 August 2010. http://www.archivesnext.com/?p=1557.

The Public Index. http://thepublicindex.org/analysis.

Verbruggen, Erwin and Johan Oomen (2012)

Online Access to Audiovisual Heritage Status Report. EUscreen Deliverable D7.6.2. http://pro.europeana.eu/documents/864473/82a7fb98-6be2-4572-b211-e1656837f6f1.

UNESCO (1980) "Recommendation for the Safeguarding and Preservation of Moving Images." http://portal.unesco.org/en/ev.php-URL_ID=13139&URL_DO=DO_TOPIC&URL_SECTION=201.html.

— "The Historical Collections (1899 -1950) of the Vienna Phonogrammarchiv." http://www.unesco.org/new/en/communication-and-information/flagship-project-activities/memory-of-the-world/register/full-list-of-registered-heritage/registered-heritage-page-8/the-historical-collections-1899-1950-of-the-vienna-phonogrammarchiv/#c191394.

Ursu, Cristian, Valentin Tablan, and Hamish Cunningham (2005) "Semantic Analysis for Tomorrow's Audiovisual Archives." PrestoSpace. http://gate.ac.uk/sale/ewimt05/ewimt05.pdf.

Wachtlar, Howard and Michael G. Christel (2002) "Digital Video Archives: Managing through Metadata." Pub106. Washington: CLIR.

Whitney, Daisy (2012) "Video Metadata Boosts Engagement Four Times; Video SEO to Rise." VidBlog, 13 July 2012. http://www.mediapost.com/publications/article/178726/video-metadata-boosts-engagement-four-times-video.html?edition=49010.

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