Digital Curation: The Challenge Driving Convergence across Memory Institutions

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ABSTRACT Collaboration between libraries, archives and museums (LAMS) is undertaken in a continuum which starts with an initial understanding of the differences between the disciplines, and can lead to full convergence with a shared mission and delivery of shared services. Collaboration brings increasing benefits in resource efficiencies and user uptake as participating organizations progress through the continuum. It is in the area of digital content creation and management that the synergies of the disciplines are most often harnessed through cooperative exploration, coordinated projects and collaborative services. This paper examines and extends the Collaboration Continuum first identified by Soehner[1] and elaborated by Zorich, Gunter, and Erway [2] through analyises of the existing research into the nature of LAM collaboration, and identification of the core ethical differences which govern seemingly similar agenda. The paper proposes digital curation as the "change agent" which will bring about full convergence between the professions, as they move through the digital content and management continuum.

Introduction

Libraries, archives and museums (LAM) are increasingly undertaking joint activities to address gaps in their resources or skills, or to create new services for their existing users; and greater visibility to potential users. Such activities, endorsed by their respective professional

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[1]   Ken Soehner, "Out of the Ring And Into the Future: The Power of Collaboration", 2005, http://worldcat.org/arcviewer/1/OCC/2007/08/08/0000070504/viewer/file1201.doc.

[2]   Diane Zorich, Gunter Waibel, and Ricky Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and Museums*, 2008, http://www.oclc.org/research/publications/library/2008/2008-05.pdf.

organisations, embrace: trust building activities such as professional networking events; coordination activities such as co-location of services; and collaborative activities such as joint outreach programmes. However, it is in the area of catalogue federation and digital content creation and management that collaborative projects have started to lead to shared services. As professional best practice develops and projects mature, LAMs are starting to converge over the need to provide for the long-term access, use and reuse of their digital materials, both digitized and born-digital, through the new disciple of digital curation.[3]

Collaboration across LAMS

LAMs have maintained a distinct identity, and the commonalities of their core remits and procedures "have not historically been dominant features in the self-characterization of libraries, museums and archives".[4] However the possibilities afforded by cross-collaboration have been examined for a number of years with a number of high profile conferences, initiated by the library profession, addressing the topic. The Library Automation Group Conference in 2000 (*Archives, Libraries and Museums Convergence*) looked in detail at cooperative digital projects across LAMs.[5] The *Choices and Challenges Conferences* of 2002 and 2004 identified the dominant themes of "invisibility, advocacy, convergence and collaboration, and focusing on the researchers and visitors" realising that

… preserving the record, whether it is a text, a photograph, or an object requires collaboration among cultural resource professionals, researchers, visitors, and the public.[6].

In 2005 the Research Libraries Group (RLG) Conference (*Libraries, Archives, and Museums: Three-ring Circus, One Big Show?*) explored the possibilities for federated

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3   Sarah Higgins, "Digital Curation: The Emergence of a New Discipline," *The International Journal of Digital Curation* 6, no. 2 (2011): 78-88, http://www.ijdc.net/index.php/ijdc/article/view/184/251. (accessed on 30 July 2012).

4   J Trant, "Emerging Convergence? Thoughts on Museums, Archives, Libraries and Professional Training" 24, no. 4 (2009): 1-24. p. 2.

5   Peter Limb, "Archives, Libraries and Museums Convergence: The 24th Library Systems Seminar, Paris 12-14 April 2000=Archives, bibliothèques et musées," *Online Information Review* 27, no. 5 (2003): 368.

6   Elizabeth Yakel, "Choices and Challenges: Cross-Cutting Themes in Archives and Museums," *OCLC Systems & Services* 21, no. 1 (2005): 13-17, http://www.emeraldinsight.com/10.1108/10650750510578091.

searching across collections. This was followed in 2006 by the Rare Books and Manuscripts Section (RBMS) of the American Library Association (ALA) Conference (*Libraries, Archives, and Museums in the Twenty-First Century: Intersecting Missions, Converging Futures?*) taking the conversation a step further by examining the question "to what extent do common goals imply common means?" through a series of case study presentations.[7] The American Society for Information Science & Technology (ASIS&T) 2009 panel session (*Information Organization in Libraries, Archives and Museums: Converging Practices and Collaboration Opportunities*) examined the range of collaboration opportunities across the sectors and the convergence of information organization practices.[8] The conversation turned global in 2011 with the International Conference on the Convergence of Libraries, Archives and Museums (ICLAM) 2011 (*User Empowerment through Digital Technologies*) scrutinising the advantages of a converged information environment for the user.[9]

Collaboration between LAMs is being encouraged at the highest professional level, with IFLA, ICA and ICOM joining with the International Council on Monuments and Sites (ICOMOS) and the Co-ordinating Council of Audiovisual Archives Associations (CCAAA) to form the International NGO Working Group on Convergence in 2008.[10] Later renamed the Libraries, Archives, Museums, Monuments and Sites (LAMMS) Coordinating Council, the group's projects focus on the areas of: copyright and other legal matters, working within the World Intellectual Property Organization (WIPO); political lobbying and practical measures

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7   Christian Dupont, "Libraries, Archives and Museums in the Twenty-First Century: Intersecting Missions, Converging Futures?," *RBM; A Journal of Rare Books, Manuscripts and Cultural Heritage* Spring, no. 8 (2007): 13-19, http://rbm.highwire.org/content/8/1/13.full.pdf. (accessed on 30 July 2012).
8   Ingrid Hsieh-Yee et al., "Information Organization in Libraries, Archives and Museums: Converging Practices and Collaboration Opportunities", 2009, http://www.asis.org/Conferences/AM09/open-proceedings/panels/36.xml. (accessed on 30 July 2012).
9   International Conference on the Convergence of Libraries Archives and Museums, "User Empowerment through Digital Technologies", 2011, http://www.nift.ac.in/ICLAM_2011/index.htm. (accessed on 30 July 2012).
10   Ingeborg Verheul, "International NGOs Bonding for Convergence of Libraries, Archives and Museums", 2008, http://www.ifla.org/files/lamms/documents/convergence-communique.pdf. (accessed on 30 July 2012).

to ensure the safety of cultural heritage, within the activities of the Blue Shield and UNESCO; and the development and standardization for global digital libraries.[11]

Few research projects have investigated the nature of collaborative activity across LAMs. A comparison of museum and library collaborations in England and the USA identified the short-term subject based project nature of these, with the English focusing on history, while the US focused on art and literature.[12] Yeates and Guy exam cross-domain collaboration to develop a local interest federated resource, identifying the driving force of the projects technical staff.[13] A report funded by IFLA identified, examined and classified a wide range of collaborative activities across archives, museums and public libraries at local level, in the developed world, formulating a best practice guide for their success.[14] Collaborative activity was found to be taking place in: event programming, integrated facilities such as education and exhibition space, and collaborative digital resource creation. An OCLC research project from 2008-2010 built on the RLG and RBMS conferences to examine collaboration in the context of LAMs with the same organizational governance, which were already committed to working together.[15] Their series of five mediated workshops identified a shared vision "of seamless collections access and community engagement on local Web sites".[16] Again collaborative activity was identified as project based, with the participating organizations

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11   International Federation of Library Associations, "About LAMMS," *International Federation of Library Associations Website*, 2010, http://www.ifla.org/en/about-lamms (accessed on 30 July 2012).; Nancy E Gwinn, "LAMMS and International Collaboration," in *ICOMOS Scientific Symposium – Malta, 2009 Changing World, Changing Views of Heritage: The Impact of Global Change on Cultural Heritage – Technological Change*, 2009, http://www.icomos.org/adcom/malta2009/pdf/ADCOM_200910_SYMP_1_Documentation_Nancy_Gwin n.pdf. (accessed on 30 July 2012).

12   Hannah Gibson, Anne Morris, and Marigold Cleeve, "Investigating Museum-Library Collaboration in England and the USA," *Libri* 57, (2007): 53-64, http://198.173.123.161/pdf/2007-2pp53-64.pdf. (accessed on 30 July 2012).

13   Robin Yeates and Damon Guy, "Collaborative Working for Large Digitisation Projects," Program: electronic library and information systems 40, no. 2 (2006): 137-156.

14   A. Yarrow, B. Clubb, and J. Draper, *Public libraries, archives and museums: Trends in collaboration and cooperation. IFLA Professional Reports No. 108*, 2008, http://archive.ifla.org/VII/s8/pub/Profrep108.pdf.

15   Diane Zorich, Gunter Waibel, and Ricky Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and Museums*, 2008, http://www.oclc.org/research/publications/library/2008/2008-05.pdf. (accessed on 30 July 2012).

16   Ibid. p.15.

focusing on shared creation and storage of digital materials, and the provision of search tools for their discovery. They identified that "with the ever increasing acquisition of born-digital materials, traditional boundaries begin to blend".[17] Lee considers how political and cultural barriers in pan-continental projects can compromise the ability to provide consistent commitment for collaborative ventures, identifying successful projects across Europe, North America and East Asia.[18]

Cumulative Collaboration

Collaboration across similar, but fundamentally different organizations cannot develop without a mutual trust, which needs to be established over time. Zorich, Waibel, and Erway[19], building on an address from the RLG Forum[20], articulate a collaborative continuum model which identifies the cumulative development of such trust, and the increasingly sophisticated investment, risk and benefits which accrue. The cumulative nature of collaboration has also been noted by Dornseif[21] who identified different levels of commitment in collaborative activity between co-located services. These two models of cumulative collaboration can be combined with the roles and responsibilities, benefits, risks and measures for success identified by the various research studies discussed above, to build an understanding of how as collaborative activities mature, commitments, benefits and risk increase, while organizations become more inter-dependent (Figure 1).

Collaborative activity between LAMs starts with *conversance*. An understanding of the professional landscape is developed by keeping abreast of professional developments through

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17 Ibid. p.14.
18 Hyuk-Jin Lee, "Collaboration in Cultural Heritage Digitisation in East Asia," *Program: electronic library and information systems* 44, no. 4 (2010): 357-373, http://www.emeraldinsight.com/10.1108/00330331011083248.
19 Zorich, Waibel, and Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and Museums*. pp. 8-12.
20 Ken Soehner, "Out of the Ring And Into the Future: The Power of Collaboration", 2005, http://worldcat.org/arcviewer/1/OCC/2007/08/08/0000070504/viewer/file1201.doc. (accessed on 30 July 2012).
21 Karen A Dornseif, "Joint Use Libraries: Balancing Autonomy and Cooperation," *Resource Sharing & Information Networks* 15, no. 1/2 (2001): 103-116.

channels such as the media, newsletters, webmail or RSS feeds. This low risk activity builds an understanding of the possibilities afforded by collaboration. Conversance may lead to *contact* either in person or through social media channels such as Twitter or Facebook. This casual experimental networking enables the exploration of commonalities such as subject, place, audience or aim. Minimal resources are expended and no commitments are made, however collaborative ideas may start to emerge and a trust relationship may start to grow. Minimal integration *cooperative* activities such as meeting together to share information on a shared point of interest will build further trust so that a vision of future activities can start to develop. The risk increases as LAMs move into *coordination*. Short-term jointly coordinated projects need a commitment from all parties to work together with a common goal to undertake an activity for a clearly defined audience. Such projects include Web based or physical joint exhibitions, educational activities or lecture programmes. Success in such selective projects requires guidance from: an engaged management; a dedicated project manager and clear aims and objectives with feasible timelines. Projects need the benefit of a stable administrative base and resources, which have been carefully planned, along with a commitment to timely communication. The risks increase proportionately to the resource expended, and projects can founder on a lack of commitment to overcome differences in procedures, priorities and language. Even one or two staff with a resistant attitude to coordinated activity can risk its success through lack of commitment to the project's goal. Co-location of services is a form of cooperation where a management commitment has risked locating seemingly similar organizations in the same managerial, and sometimes also

Collaboration Continuum	Conversance	Contact	Cooperation	Coordination	Collaboration	Convergence
Level of Integration	None	Experimental	Minimal	Selective		Full
Commitment	None	Casual networking	Trust building	Shared goal with a separable administrative framework	Shared vision with changed working practices and inter-dependencies	Shared mission and service delivery
Activities	Keeping abreast of professional developments	Exploration of differences and commonalities	Information sharing	Joint projects	Joint projects leading to shared services	Shared infrastructure
Triggers for Moving Along the Continuum	- Resources gap: skills, financial, infrastructure - Change agent: Management mandate, Staff incentives, Funding availability					
Benefits	An understanding of the professional landscape	- Trust > Vision > Commitment > Investment > Confidence > Ambition - Staff development > Professional flexibility > Best Practice Developed - Shared resources (human, financial and infrastructure > Resource efficiencies - Services, Outreach, Catalogues, Digital resources > More users				
Risks	Minimal	Minimal - Low resource commitment - Easy to walk away		- Lack of common goal /vision and resistant attitudes - Different procedures and priorities - Lack of common language - Insufficient resource capacity - Domination by one organization - Problems with intellectual property rights		- Differences not addressed prior to commitment
Measures for success	Knowledge of possible collaborators	- Trust develops - Ideas for joint working emerge		- Management commitment and involvement - Engaged and committed staff (through incentives or encouragement) - Tangible stable resources (human, financial and infrastructure) - Clear aims and objectives - Clearly defined audience - Staff training - Dedicated project co-ordinator - Administrative project base - Feasible timelines - Timely communication		Harmonization of: - Organizational procedures - Collection Management Framework - Priorities

Figure 1. The Extended Collaboration Continuum.

physical space, so that there is opportunity is created for resources to be shared and collaborations to develop "co-location of the museum and library might make collaboration more likely to occur and easier when it happened".[22] *Collaboration* deepens the commitment between LAMs, so that in certain areas they become inter-dependent and working practices have to change. A shared vision is vital for substantive joint projects such as a shared IT infrastructure, or shared provision of services, and this may be missing in forced colocation risking the success of the venture. Collaboration carries a greater risk than coordination and may require formal memorandums of agreement to ensure management commitment and resource allocation. *Convergence* happens when joint activities cease to be selective collaborations which require special project status. Instead there is a full committment to integration around a common mission. Organizationl procedures, the collection management framework and priorities are harmonized so that shared services are delivered from a shared infrastructure. There are risks associated with a lack of engagement from management and staff, a lack of resources and a lack of clarity about the aims and objectives of converging, but the main risk is that differences between LAMs are not properly addressed and procedures developed which are acceptable to all parties.

Benefits accrue as you move along the continuum. As trust develops between LAMs, so does the vision for a shared future and the commitment to making it happen. Investment in shared projects reap results and increase confidence, so that the ambition for the scale and inter-dependence of future projects grows. Development in staff through training and increased experience leads to professional flexibility and the incremental development of best practice. Additional benefits accrue from coordination, collaboration and convergence. Shared resources, be they human, finacial or through shared infrastructure can lead to efficiencies. Such efficiencies can enable better services, invigorated outreach programmes,

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22   Gibson, Morris, and Cleeve, "Investigating Museum-Library Collaboration in England and the USA."

improved catalogues and the creation of digital resources. The result is greater visibility and increased user numbers.

A number of triggers prompt movement along the collaboration continuum. The identification of a resource gaps may start an investigation into possible partners to help plug the gap, and maybe partner in a bid for project funding. Gaps may relate to financial constraints for activities outside the core service, a lack of applicaple skills for new initiatives, to develop infrastructures for new modes of service or IT, or a lack of suitable space. Moves along the continuum are generally started by what Zorich, Waibel, and Erway termed a

… "change agent" – a trusted individual, partner or program that keeps the effort alive, injects it with a dose of resources (ideas, technology, staff) at the right time and keeps the particpants focused on the overall vision they are aiming to bring to life.[23]

Change agents are characterized by Zorich, Waibel, and Erway as a "trusted individual, partner or program" a LAM[24], but they are as likely to be a co-ordinator appointed to keep project on track, to be an umbrella policy organisation which fosters a spirit of collaboration, or one which makes available an appropriate funding stream. Collaborative activities championed or funded by a *change agent* need the support of management through a mandate if a shared vision is to develop. Staff incentives, both financial or through professional recognition, such as promotion or the chance to present their work at meetings and conferences can help to keep a vision alive.

Conversance and Contact

The distinctions between LAMs are deep rooted in the separate identities of the professions, and before any progress can be made along the collaboration continuum, LAM professionals

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23   Zorich, Waibel, and Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and Museums*. p. 24
24   Ibid. p.24.

need *conversance* of these differences, so that trust can start to develop in a spirit of mutual understanding and respect.

The international bodies representing the three professions: the International Council on Archives (ICA), the International Council of Museums (ICOM) and the International Federation of Library Associations (IFLA) each publish a code of ethics (the latter in draft at the time of writing) which establish the values, principles and activities for the respective professions. These show a marked difference in their content, and core divergences in the emphases of the three professions.

The ICA Code of Ethics[25] stresses the management of the materials in their care, defined as the documentary heritage: records, documents and archival material. The emphasis is on maintaining the characteristics of an authoritative record, which are defined by *ISO 15489: The International Standard for Records Management* as: authenticity, reliability, integrity and usability[26]. The individual practitioner's primary duty is identified as the maintenance of the integrity of the records to ensure their reliable evidential nature. Protection of the authenticity of records is necessary to maintain the archival value of records, while ensuring usability through maintaining continuing access and intelligibility. The Code stresses the implementation of "good recordkeeping practices throughout the life-cycle of documents"[27] to maintain "the archival value of records".[28] Archival value is maintained through practicing archival principles when undertaking and recording the recordkeeping tasks of: appraisal, arrangement, description, preservation and conservation. Archival principles, first defined in 1898[29] still form the basis of professional activity.

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25 International Council on Archives, *International Council on Archives Code of Ethics*, 1996, http://www.ica.org/download.php?id=574. (accessed on 30 July 2012).
26 International Organization for Standardization, *ISO 15489-1:2001, Information and Documentation - Records Management - Part 1: General*, 2001.
27 International Council on Archives, *International Council on Archives Code of Ethics*. Clause 5
28 International Council on Archives, *International Council on Archives: Code of ethics*, 1996, http://www.wien2004.ica.org/sites/default/files/Ethics-EN.pdf. Clause 3
29 Samuel Muller, Johan Feith, and Robert Fruin, *Manual for the arrangement and description of archives drawn up by the direction of the Netherlands Association of Archivists*, 2nd ed. (New York: Wilson, 1968).

- principle of provenance: "records created or received by one recordskeeping unit should not be intermixed with those of any other".[30]

- principle of original order: "records should be maintained in the order in which they were placed by the organization, individual, or family that created them".[31]

For archivists the initial selection of material should be undertaken with impartiality and due regard the evidential value, while taking account of corporate and personal privacy. Providing access to the materials is not the primary concern of *The ICA Code*, and although the provision of an archival service is expected, there are a number of caveats concerning possible imposition of access restrictions.

By contrast the draft *IFLA Code of Ethics for Librarians and Other Information Workers* identifies the provision of access to information as the core mission for information professionals.[32] Five of its six clauses discuss the professional requirement to provide unrestricted, effective and indiscriminate access to information, with articulation of the profession's support for open source environments and intellectual property rights that enhance creativity. The emphasis on access is linked to societal need to share information and the rights set out in Article 19 of the *Universal Declaration on Human Rights* "to seek, receive and impart information and ideas through any media and regardless of frontiers".[33] However, the code also reflects the *Five Laws of Library Science*[34] which established the core ethical values of the library profession.

1. books are for use rather than for preservation – leading to vitalisation of the library

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30   Maygene Daniels, "Introduction to Archival Terminology," in *Web Version based on: A Modern Archives Reader: Basic Readings on Archival Theory and Practice*, Web edition. (National Archives Trust Fund Board, 1999), http://www.archives.gov/research/alic/reference/archives-resources/terminology.html. (accessed on 30 July 2012).

31   Ibid.

32   International Federation of Library Associations, *(International / IFLA-) Code of Ethics for Librarians and Other Information Workers, Draft* (The Hague, 2011), http://www.ifla.org/files/faife/news/ICoE-Draft-111208.pdf. (accessed on 30 July 2012).

33   United Nations, "The Universal Declaration on Human Rights", 1948, http://www.un.org/en/documents/udhr/index.shtml. (accessed on 30 July 2012).

34   Shiyali Ramamrita Ranganathan, *The Five Laws of Library Science* (Madras Library Association, 1931), http://babel.hathitrust.org/cgi/pt?id=uc1.b99721;page=root;view=1up;size=100;seq=9;orient=0.

2. books are for all rather than the chosen few – making the library a responsibility of society for the education of all

3. books should be openly accessible, arranged and catalogued to promote discovery – enabling both structured and serendipitous discovery

4. save the time of the reader – library management should be reader-centric enabling fast and efficient retrieval

5. the library is a growing organism – enabling growth and change in the service

Unlike the *ICA Code*, the *IFLA Code* does not dwell on the actual activities required to manage the materials beyond: the need to "organize and present content" to allow autonomous access; and the definition of published policies for "selection, organization, preservation, provision and dissemination of information".

The ICOM Code of Ethics for Museums takes a corporate rather than a personal view of the profession, and as such details the policies, processes and responsibilities required to underpin their responsibility for the natural and cultural heritage, and the legal framework in which museums operate.[35] More holistic than either the *ICA Code* or the *IFLA Code* it identifies both the management of the materials in their care and as the promotion of their collections as the primary responsibilities. The underlying ethos is "that of service to society, the community, the public and its various constituencies, as well as the professionalism of museum practitioners".[36] The current code grew out of the *Ethics of Acquisition* that identified "certain principles of ethics and professional integrity in relation to acquisition" and reinforced the ethical link between acquisition of materials and their use for research, education and conservation.[37] This link between collecting and service to a user community

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35 International Council of Museums, *ICOM Code of Ethics for Museums* (Paris, October 2006), http://icom.museum/fileadmin/user_upload/pdf/Codes/code2006_eng.pdf. (accessed on 30 July 2012).
36 Ibid. p. iv.
37 International Council of Museums, "Ethics of Acquisition", 1970, http://www.museum.or.jp/icom-J/acquisition.html. (accessed on 30 July 2012).

was established in the first *Code of Ethics for Museum Workers*[38]: "their [museums] value is in direct proportion to the service they render the emotional and intellectual life of the people. The life of a museum worker is essentially one of service".[39]

The rounded inter-relationships of ethical concerns for the museum profession have been summarized as an equal balance between collections care and public service.[40] This balanced ethical outlook contrasts with the collection centric view of the archive profession and the user centric view of the library profession. The fundamental differences in character between archives and museums have been summarized as "archives are more often wholesalers and largely contribute to the products of others … museums were retailers with direct products for users"[41]. Libraries similarly offer a direct product and access methods for their users.

Becoming *conversant* with the practices of a different domain so that the professional landscape can be fully understood, and making *contact* through, for instance, the sort of casual networking offered by the cross-domain conferences highlighted above or social networking channels, can ensure a deeper understanding of the different professional stances in an experimental, low risk and low commitment environment, before any commitments to further activity are made.

Cooperation and Coordination

Despite the different collection focuses and divergent ethical emphases, the three *Codes* show that there is cross-sectoral agreement that their function is the care of collections and provision of access to these, so that they can be used. These "key commonalities of

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38   Alissandra Cummins, "ICOM's Ethical Principles," *Danske Museer* 23, no. 4 (2010), http://icomdanmark.dk/etikseminar2010/Cummins_ICOM_ethical_principles_2010.pdf. (accessed on 30 July 2012).

39   American Association of Museums, *Code of Ethics for Museum Workers* (American Association of Museums, 1925).

40   Gary Edson, "Ethics," in *Museum Ethics*, ed. Gary Edson (New York: Routledge, 1997), 2-15.

41   Elizabeth Yakel, "Choices and Challenges: Cross-Cutting Themes in Archives and Museums," *OCLC Systems & Services* 21, no. 1 (2005): 13-17, http://www.emeraldinsight.com/10.1108/10650750510578091. p.16. (accessed on 30 July 2012).

collecting", are the basis of the movement along the continuum to *cooperative* and *coordinated* activities.

LAMs are distinguished by institutional persistence and user trust, which are the basis of the development and continuation of knowledge communities.[42] Crucially, although divergent in the types of material they collect, LAMs all provide sustainable collections which are managed by experts. Their role as "sustained institutions to collect, organize, preserve, and provide access to knowledge-bearing objects" co-evolved their expertise, methodologies and tools for organizing and interpreting knowledge[43] so that parallel systems were developed for the core tasks this involves.

LAMs can only ensure the sustainability of collections and expertise knowledge management function in an organizational environment which ensures the "physical and moral defence" of their collections.[44] That is the physical and intellectual security of collections, through effective collections management underpinned by policies which address both the organizational environment and the day-to-day administration.

The UK's *Publically Available Specification (PAS) 197* identifies the similarities of processes and procedures across the LAMs, articulating a cross-sectoral *Code of Practice for Cultural Collections Management*.[45] A thesaurus to the collection processing workflow across the disciplines is provided,[46] clearly identifying a limited distinction in information organization practices (Table 1), despite the semantic differences. All three disciplines: identify items to collect; receive them into their care; classify, catalogue and index; and periodically review and remove items from the collection.

42　Margaret Hedstrom and John King, *On the LAM: Library, Archive, and Museum Collections in the Creation and Maintenance of Knowledge Communities*, 2002, http://www.oecd.org/dataoecd/59/63/32126054.pdf. (accessed on 30 July 2012).
43　Ibid.
44　Hilary Jenkinson, *Manual of Archive Administration*, 2nd ed. (London: Lund Humphries, 1966).
45　British Standards Institution, *PAS 197: Code of Practice for Cultural Collections Management*, 2009.
46　Ibid. p. 6.

Workflow Order	Library Item	Archive Item	Museum Item
1	Selection	Pre-accession	Entry
2	Acquisition	Accession	Acquisition
3	n/a	n/a	Accession
4	n/a	Appraisal	n/a
5	Cataloguing	Cataloguing	Cataloguing
6	De-accession / Withdrawal	De-accession	De-accession / Disposal

Table 1. Collection Processing Workflow in PAS 197.[47]

The PAS provides a discipline neutral Collections Management Framework which includes these information organization procedures as part of an overall collection management policy, administered within an encompassing organizational remit in which the policies, processes and procedures are constantly monitored through internal audit and management review, so that improvements can be made. The collection management policy also includes the collection administration areas of: collections development, collections access and collections care. A granular list of processes, again domain neutral, associated with each of these areas is supplied in the PAS. The exhaustive list of activities will be familiar to all in the LAM professions and includes, for example, condition checking, displaying and exhibiting, assessing impact and packing.

These similarities can form the basis of cooperative and coordinated activities where areas of synergy can be explored, information on best practice shared and the possibilities of co-location of services can be explored for the benefits of both staff and users, along with financial and space saving benefits.

Collaboration for Digital Collections Creation and Management

In the digital age access to documentary heritage is no longer geographically restricted to those who can present themselves in person, relying on a cultural organization's ability to

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47   Ibid.

produce a physical object on request. Archival documents and copies of books are increasingly provided in digital format through the Internet, making digital surrogates, cheap to the end user, ubiquitous across information management disciplines. These preserve the original from over-use, but more pertinently provide both remote and multiple user access. Archives and museums are challenged by the management of both digitized and born-digital documents; libraries are dealing with the rise of the eBook; and the academic sector is grappling with institutional repositories and research data management. Collection development is also no longer restricted by the physical location of the material, or guardianship of the trusted organization charged with the primary care of the authentic copy. Collaborative virtual libraries, which serve a community of interest, or bring together related or separated materials, can be readily developed.

Since the late 1990s much collaborative effort has been dedicated to enabling the online delivery, search and discovery of materials held by LAMs. Gibson, Morris, and Cleeve noted that many of the collaborative projects they studied had some level of digitization, federated search, or shared database activity.[48] Yarrow, Clubb, and Draper noted global, continental, national and local initiatives to create collaborative digital resources.[49] Most strikingly, participants in Zorich, Waibel, and Erway's 2008 study only identified digital initiatives as a basis for their collaborations.[50]

In the late 1990s the US Digital Libraries Initiative acted as the "change agent" in USA, providing funding to experiment with the possibilities of new technology. In the UK this role was taken through funders such as the Joint Information Systems Committee (JISC), initially through it's explorative eLib Programme, which emphasized the practical collaborative

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48   Gibson, Morris, and Cleeve, "Investigating Museum-Library Collaboration in England and the USA."
49   Alexandra Yarrow, Barbara Clubb, and Jennifer-Lynn Draper, *Public Libraries, Archives and Museums: Trends in Collaboration and Cooperation*, 2008, http://www.ifla.org/files/public-libraries/publications/prof-report-108/108-en.pdf.
50   Zorich, Waibel, and Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and Museums*.

application of technologies to providing materials for learning and teaching.[51] Other UK funders suchas the Arts and Humanities Research Board (AHRC) also provided competitive funding for collaborative digitization projects focusing on providing scholarly materials for research analysis through the new discipline, digital humanities[52].

A skill base in digitization was initially built through hand-crafted *boutique* digitization projects, "for which the principal goal [was] experimentation with new technologies and extraordinary attention to the unique properties of each artefact".[53] As more sophisticated practice developed the focus shifted to "the creation of useful and relevant collections that served the needs of one or more communities of users".[54] Many organizations now undertake mass digitization, or orchestrate the federation or aggregation of diverse digital materials from a range of cultural organizations. There are many such projects worldwide and only three, with local resonance for the author are mentioned here as examples of the range of activities being undertaken. Europeana is a European scale project originally funded by the European Commission's eContent*plus* Programme.[55] It provides

… a single access point to millions of books, paintings, films, museum objects and archival records that have been digitized throughout Europe[56] … [which] enables people to explore the digital resources of Europe's museums, libraries, archives and audio-visual collections[57]

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51   Chris Rusbridge, "Towards a Hybrid Library," *D-Lib Magazine*, no. July/August (1998), http://dlib.ukoln.ac.uk/dlib/july98/rusbridge/07rusbridge.html. (accessed on 30 July 2012).
52   King's Collge London, "Digital Humanities Modules: Why Should You Take Digital Humanities Modules as Part of Your MA?", n.d., http://www.kcl.ac.uk/artshums/depts/history/modules/level7/digi.aspx. (accessed on 31 July 2012).
53   Paul Conway, "Preservation in the Age of Google: Digitization, Digital Preservation, and Dilemmas," The Library Quarterly 80, no. 1 (2010): p.76.
54   National Information Standards Organization (NISO), *A framework of guidance for building good digital collections, 3rd edition* (Baltimore, MD, 2007), p. 1, http://www.niso.org/publications/rp/framework3.pdf (accessed on 31 July 2012).
55   The eContent*plus* programme closed on 31 December 2008. Its successor is the Information and Communications Technologies Policy Support Programme which now has European as its first objective – see http://ec.europa.eu/information_society/activities/econtentplus/index_en.htm. (accessed on 31 July 2012).
56   Europeana Professional, "About Us," *Europeana*, n.d., http://pro.europeana.eu/web/guest/about. (accessed on 31 July 2012) .
57   Europeana Think Culture, "Europeana: Think Culture", n.d., http://www.europeana.eu/portal/. (accessed on 31 July 2012).

through aggregation of resources and metadata cross-walking. The best practice guidelines from the associated Europeana Travel Project[58] identify the most appropriate guidance available in the areas of: content creation and access, digitization project management, and user studies.[59] On a national level, the People's Collection of Wales[60] is a project sponsored by the Welsh Government. It not only aggregates resources from Welsh LAMs, and associated cultural heritage organisations, but taps into the collaborative content creation spirit of Web 2.0, by enabling any group or individuals to participate by contributing their own materials, which then go through a quality assurance process. This project directly addresses the

… tension between the vision of seamless collections access and community engagement on local Web sites, and the shift to online user behaviour where access and engagement now occur at a broader network level

expressed by participants in Zorich, Waibel and Erway's study.[61]

On an individual organizational level, the National Library of Wales undertakes large digitization projects of diverse materials of cultural significance to Wales, as a core funded activity, while leading collaborations in externally funded aggregation projects. A current project, funded by JISC "will conduct mass digitization of primary sources relating to World War One from the Libraries, Special Collections and Archives of Wales".[62]

Digital Collaboration and Technical Skills

Building digital collections is now a mature activity and holistic international best practice, which addresses all of the socio-economical, organizational and technical challenges, has been developed iteratively. Best practice in digitization, and caring for born-digital materials,

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58   The Europeana Travel Project is now completed but information on it can be found at:
      http://www.europeanatravel.eu/. (accessed on 31 July 2012).
59   Karmen Štular Sotošek, *Best practice examples in library digitisation*, 2011,
      http://www.europeanatravel.eu/downloads/ETravelD2 2final.pdf. (accessed on 30 July 2012).
60   People's Collection Wales, "People's Collection Wales", n.d., http://www.peoplescollectionwales.co.uk/.
      (accessed on 31 July 2012).
61   Zorich, Waibel, and Erway, *Beyond The Silos of LAMs: Collaboration Among Libraries, Archives and
      Museums*. p.15.
62   Joint Information Systems Committee, "JISC: Strand B: Mass Digitisation", n.d.,
      http://www.jisc.ac.uk/whatwedo/programmes/digitisation/content2011_2013/Strand B.aspx. (accessed on
      31 July 2012).

has been collated and codified by the US National Information Standards Organisation (NISO); a US led international collaborative effort, intended for the domain neutral "cultural heritage" and "funding" organizations.[63] This guidance considers *good* digital collections in the context of four sets of principles relating to: 1) collection development and processing; 2) digital object creation and management; 3) metadata creation and management; and 4) public service and project management.

The *initiative principles* of the document, which mostly relate to public service delivery will be familiar activities to LAM professionals concentrating on project management, staffing marketing and evaluation. Meanwhile, eight of the *collection principles*, on face value are activities for which form the basis of LAM professionals ethical codes and for which they are trained. Table 2 shows how they can be mapped directly onto the collection care areas covered by the PAS Collection Management Framework.[64]

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63   Ibid. p.1.
64   British Standards Institution, *PAS 197: Code of Practice for Cultural Collections Management.* p7.

PAS Collection Management Framework	Collections development policy, processes and procedures	Collections information policy, processes and procedures	Collections access policy, processes and procedures	Collections care and conservation policy, processes and procedures
NISO Collections Principles	Principle 1: A good digital collection is created according to an explicit collection development policy.	Principle 2: Collections should be described so that a user can discover characteristics of the collection, including scope, format, restrictions on access, ownership, and any information significant for determining the collection's authenticity, integrity, and interpretation. Principle 5: A good collection respects intellectual property rights.	Principle 4: A good collection is broadly available and avoids unnecessary impediments to use. Collections should be accessible to persons with disabilities, and usable effectively in conjunction with adaptive technologies. Principle 6: A good collection has mechanisms to supply usage data and other data that allows standardized measures of usefulness to be recorded.	Principle 3: A good collection is curated, which is to say, its resources are actively managed during their entire lifecycle. Principle 9: A good collection is sustainable over time.

Table 2. Elements of the PAS 197 Collections Management Framework Mapped Against the NISO Collections Principles.[65]

However, the actual activities they describe require, in the main, technical or specialist training and knowledge for implementation: access restriction needs knowledge of digital authentication procedures and digital assurance; respecting intellectual property rights needs knowledge of digital governance; and lifecycle management needs knowledge of digital preservation procedures. The remainder of the collection development principles deal with a completely new skill-set which requires IT competency: the need for a collection to be interoperable for repurposing and contextual understanding; the need for a collection access methodology to integrate with a users normal workflow through the provision of orgainizational and collaboration tools; and the need for a collection to be sustainable over time. The same is true for the principles relating to the creation and management of a digital objects. Although the need to assign a persistent identifier and associated metadata, while

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65   Ibid; National Information Standards Organization (NISO), *A framework of guidance for building good digital collections, 3rd edition*.

maintaining contextual information and authenticity are familiar to all LAM professionals, the technical requirements of undertaking these tasks in the digital realm may not be. Exhaustive instructions for the creation of standards compliant, interoperable metadata which uses authority control, content standards and crosslinks to other resources to facilitate cross-searching while supporting the "long-term curation and preservation of objects in collections"[66], signposts the need for specialist metadata practitioners to design data models before any cataloguing activity can be undertaken.

Developing and managing collaborative digital collections is now as much a technical endeavour as an information management one, and the emphasis is on the management and delivery of digital collections that "should be accessible through the Web, using technologies that are well known among the target user community",[67] while advocating "the entire lifecycle of the digital collection and associated services".[68] Successful delivery relies on both information professionals and IT professionals to build an interoperable technical architecture. The ambition, scale and complexity of most endeavours meaning it is no longer possible for a LAM professional with some technical know-how to *have a go*.

Convergence Through Digital Curation

The NISO guidance articulates an interoperable technical infrastructure, which considers the possibilities of long-term access, use and reuse from the outset, rather than an after-thought when the funding has ended.[69] Funding agencies are starting to mandate long-term maintenance of digital material created with their funding, in the UK taking their lead from the Research Councils UK's *Common Principles on Data Policy*[70]. This focus on "ensuring that digital material is managed throughout its lifecycle so that it remains accessible to those

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66   National Information Standards Organization (NISO), A framework of guidance for building good digital
       collections, 3rd edition. p. 62.
67   Ibid. p. 11.
68   Ibid. p. 86.
69   Ibid. p.1.
70   Research Councils UK, "Excellence with impact: RCUK common principles on data policy", n.d.,
       http://www.rcuk.ac.uk/research/Pages/DataPolicy.aspx.

who need to use it"[71] is the basis of *digital curation*. This new discipline considers all the activities required to maintain access to digital materials over the long-term, rather than the short-term goals of content creation. Long-term management cannot be undertaken as short-term projects, but requires a consistent funding stream, management structure and technical methodologies.

The Open Archival Information Systems Reference Model (OAIS)[72] was identified, as "a common framework for digital preservation applications"[73] while it was in development. It describes both the information architecture and the organizational requirements for the long-term care of digital material. This has formed the basis of much collaborative activity to provide technical applications including the development of storage solutions in the form of *open repositories*, and metadata standards for both creating information packages[74] and describing preservation activities[75]. Like digital content creation, many of the activities required form the basis of LAM ethical codes. The *mandatory responsibilities* described by OAIS[76] can be mapped directly to the core activities of information professionals described in both their ethical codes and PAS 197 (Table 3). However, the technical challenge requires co-working with IT professionals, and specialist training to enable this are seeing the development of converged services.

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71   Higgins, "Digital Curation: The Emergence of a New Discipline. " p. 79.

72   International Organization for Standardization, *ISO 14721: Space data and information transfer systems — Open archival information systems — Reference model*, 2003.

73   Higgins, "Digital Curation: The Emergence of a New Discipline. " p. 80.

74   The Metadata Encoding Transmission Standard (METS) was developed explicitly to address the Information Model identified in section 4.2 of OAIS. More information can be found at: http://www.loc.gov/standards/mets/. (accessed on 31 July 2012).

75   The PREMIS Data Dictionary for Preservation Metadata took OAIS as a developmental start point. The full standard can be found at: http://www.loc.gov/standards/premis/v2/premis-2-2.pdf. (accessed on 31 July 2012)

76   International Organization for Standardization, ISO 14721: Space data and information transfer systems — Open archival information systems — Reference model. p. 3-1.

Mandatory Responsibility of OAIS	Information Professionals Core Activities
Collect archival materials from the creator and accession into the repository supported by Collections Policy, Acquisition Policy and Accessions Policy.	Collect materials and accession into the collection supported by Collections Policy, Acquisition Policy and Accessions Policy.
Arrange, describe and ensure finding-aids are available for the material. Prepare the material for storage by removing anything harmful to long-term preservation, packaging appropriately and store in a suitable environment.	Arrange, describe and catalogue the material. Prepare the material for storage and store in a suitable environment.
Develop an Access Policy and access methodology to ensure the material can be made available to the identified users.	Develop an Access Policy and access methodology to ensure the material can be made available to the identified users.
Provide contextual information through arrangement and description - catalogues, finding-aids and interpretive materials.	Provide contextual information through provision of catalogues, finding-aids and interpretive materials.
Implement a Preservation Policy which ensures the materials do not deteriorate and are handled appropriately. Ensure secure storage so that records are not tampered with or inappropriately copied.	Implement a Preservation Policy which ensures the materials do not deteriorate, are handled appropriately and securely stored.
Ensure provision and procedures for access are in place for the identified users.	Ensure provision and procedures for access are in place for the identified users.

Table 3. The Mandatory Responsibilities of OAIS Mapped Against Collection Management Procedures for LAMs.[77]

Digital curation is the *change agent* which is moving LAMs along the collaboration continuum from *collaboration* to *convergence*. The technical challenges and investment required mean that organizations are forced to pool experience and expertise. Best practice and technical methodologies are developing through consortia discussion and training[78] and collaborations developing so that shared missions and shared services and infrastructure are starting to emerge such as the MetaArchive Cooperative in the US, which openly declares interdependence between partners.[79] An example, local to the author, is the development of a

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77   Ibid; Sarah Higgins, "Digital Curation: New Medium, Old Methods," in *Archives and Records Association of the UK and Ireland* (Edinburgh, 2011).

78   In the UK the Digital Preservation Coalition (DPC), a cross-domain collaborative membership organization offers training, support and networking. The Digital Curation Centre (DCC) also offers these, but focuses on research data management in Higher Education.

79   Educopia Institute, "MetaArchive Cooperative: Declaration of Interdependence", 2012, http://www.metaarchive.org/declaration.

shared digital curation service across Wales, being led by the Archives and Records Council Wales (ARCW).

Digital curation is now articulating its own agenda, based around this convergence of the core skills of LAM professionals and the discipline of informatics. Domain neutral continuing professional development courses, and awareness raising events, to bring LAM professionals up to speed; and optional training as part of relevant university courses, are now maturing into dedicated degree programmes that address both the procedural and technical skills required for information engineering.[80] Ataman has identified mainly technical skills in his list of *add-ons* for the information training: content presentation and management; trustworthy storage, digital forensics and e-curation, giving records management the procedural role.[81] Simmons College in the US received a grant in 2009 "for the development of a Cultural Heritage Informatics curriculum specifically designed to address the digital convergence of cultural heritage institutions - libraries, archives, and museums"[82], which brings together the social, technical, cultural and political concerns for stewardship to ensure *curation ready data*.[83] Lee and Tibbo during the DigCCurr project analysed the core knowledge and capabilities which need to be developed, and the rationale behind these, to develop a holistic curriculum that considers both the conceptual and practical skills required by digital curation professionals. They identified the need to teach a professional context for

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80   Christopher A Lee and Helen Tibbo, "Where's the Archivist in Digital Curation? Exploring the Possibilities through a Matrix of Knowledge and Skills," *Archivaria: the Journal of the Association of Canadian Archivists* 21, no. Fall 2011 (n.d.), http://journals.sfu.ca/archivar/index.php/archivaria/article/view/13362/14668.

81   Bekir Kemal Ataman, "Requirements For Information Professionals in a Digital Environment: Some Thoughts," *Program: Electronic Library and Information Systems* 43, no. 2 (2009): 215-228, http://www.emeraldinsight.com/10.1108/00330330910954415.

82   Jeannette a. Bastian, Michele V. Cloonan, and Ross Harvey, "From Teacher to Learner to User: Developing a Digital Stewardship Pedagogy," Library Trends 59, no. 4 (2011): 607-622, http://muse.jhu.edu/content/crossref/journals/library_trends/v059/59.4.bastian.html. (accessed on 31 July 2012).

83   The properties of curation ready data can be found in Figure 2.2 of: Sarah Higgins, "The lifecycle of data management," in *Managing Research Data*, ed. Graham Pryor (Facet Publishing, 2012).

digital curation with values and principles as a discipline in its own right, along with the technical requirements for ensuring digital material remains useable and useful.[84]

Digital Creation and Management Continuum

Digital creation and management has followed its own continuum becoming increasingly sophisticated as technologies advance, the possibilities for their implementation are explored, and best practice develops. User needs are driving the need for better, bigger and more stable resources, with improved delivery methods

… it is also necessary for cultural institutions to go beyond the provision of mere databases of disparate objects and intellectual items, to create compelling navigational and learning experiences for end-users and to provide appropriate contexts for use and learning. [85]

The depth of collaboration between LAMS has followed this continuum with *coordination* of small scale experimental projects giving way to *collaboration* to develop federated or aggregated services. The maturity of practice is now starting to require *convergence* to deliver a shared infrastructure for digital curation (Figure 2).

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84 Helen Tibbo and Christopher Lee, "Convergence through Capabilities: Digital Curation Education for Libraries, Archives and Museums," in Archiving 2010 (IS&T, 2010), 53-57, http://www.ils.unc.edu/callee/p53-tibbo.pdf. (accessed on 31 July 2012).

85 Yeates and Guy, "Collaborative Working for Large Digitisation Projects." citing: M Nickerson, "Voices: bringing museum exhibits to the world wide web," *First Monday* 7, no. 5 (2002), http://firstmonday.org/issues/issue7_5/nickerson/index.html. (accessed on 31 July 2012).
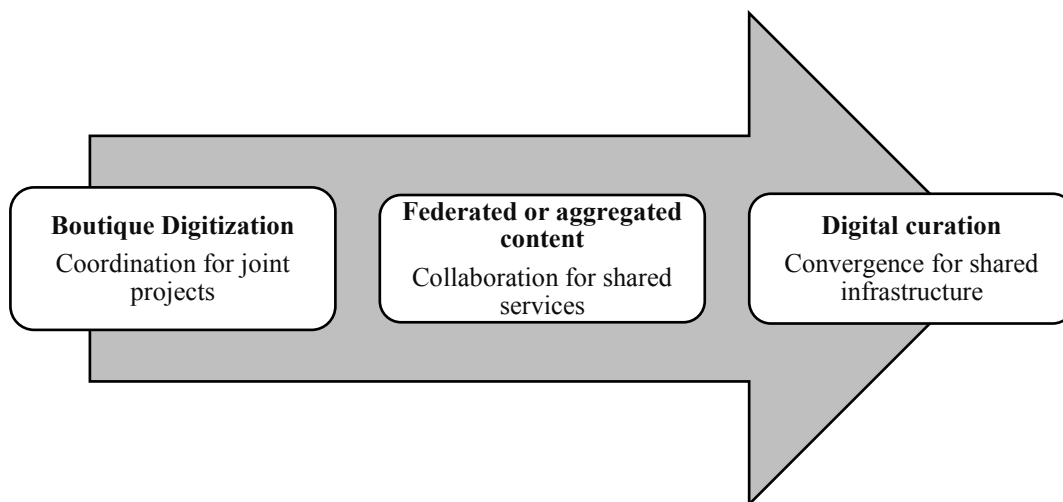
Figure 2. The Digital Creation and Management Continuum

Conclusion

Collaboration across LAMs follows a continuum with increasing levels of trust, integration, commitment and benefits as organizations move through the different stages. Movement between the stages is usually triggered by the need to address a resources gap, and the presence of a change agent to deliver the incentive. Change agents have been prompted by technical advances and development of best practice for digital collection development and management. Not every library, archive or museum is on the same stage in the collaboration continuum, but the imperatives of the digital age mean that most have started the journey, deriving benefits from shared resources and the efficiencies this brings, as trust develops and vision and commitment increase.