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The Importance of European Collaborations to Support Open Science and Digital Library Development

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Abstract

This paper looks at the distinguished career of Pat Manson and identifies key themes in her work on digital libraries. It then takes those themes, as Pat prepares for well-deserved retirement, and sketches out the challenges which face libraries and European organisations in 2016. The themes chosen are: Open Science, Copyright reform and Open Access to Publications. The paper concludes that while libraries now have a voice at European top tables, the challenge is to fine tune that voice in order to create and deliver infrastructure, policies and services which support Open Science in the twenty-first century.

Key Words: European Commission; Open Science; Open Access; Copyright

1. Introduction

The purpose of this paper is to look at the importance of collaboration across national borders for European libraries, and in doing so to pay tribute to the important role that Pat Manson has played in fostering those collaborations and in setting the agenda for European libraries. Pat has worked at the European Commission since the early 1990s on ICT applications areas in the Community's research programmes. Prior to joining the Commission

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she worked in the UK on a research-funded post providing technology and market watch, as well as information and advisory services to the cultural heritage community on the adoption of ICTs. Patricia Manson is Head of Unit, Inclusion, Skills and Youth, in the Directorate General for Communications Networks, Content and Technology of the European Commission. As such she is responsible for the Commission's research and innovation projects on ICT and learning, and for those on the use of ICT for inclusion, e-accessibility and assistive technologies. The unit is also responsible for the Commission's strategy on a Better Internet for Children and for the Safer Internet Programme.

European universities have benefitted enormously from European funding programmes. The Horizon 2020 programme, the 8th Framework Programme (FP) for the European Research Area (ERA), was on its creation worth £67 billion (€80 billion) (Amos, 2014). UK research hoped to receive around £2 billion in the first 2 years of Horizon 2020, which would be equal to just over one fifth of the British Government's spend on Science. LERU (League of European Research Universities) welcomed this level of investment into European research: 'Above all, this means continued substantial investment in European research and innovation capabilities. These are fundamental to the vibrant knowledge economy that Europe needs to drive private sector investment, human capital formation, employment and sustainable growth in a rapidly changing global economic and political landscape and in the face of the multiple challenges that confront all our societies in the years to come' (LERU, 2012).

The Framework Programmes, including Horizon 2020, have benefitted libraries and Pat Manson has been tireless in supporting this activity. In 2008, Pat gave a talk at the LIBER/EBLIDA Digitisation Workshop in Copenhagen in 2007 (Manson, 2007). Her title was "*European strategies for digitisation: the context of i2010 digital libraries*". Pat talked about the Commission strategy for the Information Society—a flagship initiative on Digital Libraries comprising digitisation, accessibility and the preservation of cultural and scientific information, all made visible through the European Digital Library. A principal theme was that everyone should be able to access individual and shared heritage. One of the most notable fruits of this activity is Europeana, the prototype of which was launched on 20 November 2008 with 4.5 million digital objects (Wikipedia, n.d.). The enormous reach of the Europeana service is such that today the Europeana portal provides access to just under 50 million digital objects—artwork, archives, artefacts, books, videos and sound.

Pat Manson's contribution to these developments is priceless and her retirement provides an opportunity to take stock of the current state of digital library developments in Europe. What, in January 2016, are the main issues facing European research libraries?

2. Open Science

One of the most important agendas facing research organisations is that of Open Science, or Science 2.0. In essence, Open Science refers to a cluster of ideas and themes which—in a digital environment—have the power to transform the way research is pursued and disseminated. These concepts include, but are not restricted to, Open Access to Publications, Research Data Management and Open Data, Research Assessment and Evaluation, Citizen Science, and future Models of Peer Review.

Pat Manson has herself spoken about aspects of Open Science. In July 2015, for example, Pat gave a video interview on Open Discovery Space (ODS) where she talked about the importance of the Connected Classroom and the need for training and skills development to allow citizens across national borders to have access to learning infrastructures (OpenDiscoverySpace, 2015).

In 2014, the European Commission undertook at a consultation exercise with research organisations across Europe (European Commission, 2015a). 498 complete responses were received, along with 27 position statements. The summary Table, assessing the need for policy interventions, gives a summary overview of the current state of thinking by stakeholders in each of the areas, based on the position statements.

Table 1 shows the % of agreement for interventions, whether certain Actions are absolutely required, and whether there should be intervention at EU level. 'Need for intervention' is understood as the identified gap or blockage in Open Science' (or reasons why there is a need). 'Required action' refers to what policy-makers could do in general. 'Implement at EU level' refers to what the European Commission (or European institutions) could do.

In the whole of the Open Science debate, the area where there was the largest support for intervention is in Section 4 on Mainstream Open Access to Publications and Data. Here 63% of the responses said that there was a need

Table 1: Percentage of agreement for certain policy actions (based on analysis of position statements).

	Intervene		Required action		Implement at EU level	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. Foster Open Science						
(a) Raise awareness, Stakeholder ownership	52%	4%	48%	4%	19%	4%
1(b) Potentially more reliable, efficient, responsive science	33%	7%	0%	7%	4%	4%
1(c) Better Knowledge Circulation	41%	11%	30%	4%	7%	7%
2 Remove barriers						
(a) Lack of credit for Open Science	37%	7%	26%	4%	0%	4%
2(b) Obstacles to non-academic involvement	7%	4%	4%	4%	0%	4%
2(c) Laws on Text and Data Mining	19%	7%	11%	7%	11%	7%
2(d) Laws on personal data	19%	7%	22%	7%	11%	7%
2(e) Lack of e-skills	44%	4%	19%	11%	15%	7%
3 Develop research infrastructures	56%	4%	11%	4%	48%	4%
4 Mainstream Open Access to publications and data	63%	11%	33%	26%	26%	11%
5 Open Science as economic driver	22%	7%	7%	7%	7%	7%
6 Altmetrics						
(a) Traditional metrics do not capture Open Science	22%	7%	22%	7%	4%	7%
(b) Need way to evaluate Open Science outputs	30%	4%	19%	4%	4%	4%
(c) Raise awareness	33%	4%	15%	4%	0%	4%
(d) Ensure accuracy etc.	41%	0%	4%	7%	4%	7%
7 Citizen Science						
(a) Scientists distant from Citizens	11%	11%	7%	4%	0%	4%
(b) Citizen Science—what is its role?	11%	4%	7%	0%	4%	4%
8 Future of Peer Review	19%	11%	22%	7%	15%	7%
9 International Competitiveness	26%	4%	19%	4%	0%	4%
10 Research Careers	33%	7%	0%	7%	0%	11%

Colour code: red (0%), orange (0–5%), yellow (5–19%), green (>19%).

for intervention. 52% in Section 1 agreed that there was a need to foster Open Science by raising awareness. 56% of responses in Section 3 highlighted the need to build research infrastructures.

Table 1 also suggest another important finding from the responses, and that is the general lack of support for intervention at EU level. 6 of the sections scored 0% here:

- 2a—Address lack of credit for Open Science
- 2b—Remove obstacles to non-academic involvement
- 6c—Raise awareness of altmetrics
- 7a—Citizen Science—scientists are distant from citizens
- 9—International competitiveness
- 10—Research careers

The official Open Science validation document suggests that this may be in part because position statements often did not include suggestions of specific actions or included actions that were much less specific than the ideas outlined in the Table above. This is possible, but there may be another reason which helps to explain the 0% scores. This is that the stakeholder community was uncomfortable with the idea that the EU should intervene to take forward the agenda under its own initiative. Indeed, partnership working and collaboration infuse many of the answers in Table 1.

This reading of the answers in the Table is strengthened by studying the answer to Section 3 where 48% of the responses said that there was a need for central EU intervention to build and pay for research infrastructures to deliver the Open Science agenda. Where money is involved, it could be said that the research stakeholder community is happy for the European Commission to pay, but not so happy to see it intervene in other areas. If this reading is true, then it is a sanguine lesson to be learned—that the previous Framework Programmes which have been led by the Commission have still not fully addressed the issue that many stakeholders feel uncomfortable at addressing agendas in which they are not full collaborating partners.

3. Copyright Reform

Pat Manson spoke many times about copyright reform in the course of her career. In the LIBER/EBLIDA Digitisation Workshop in 2007, for example,

Pat talked about the 20th century black hole in copyright, orphan works, out of print works, and the need for practical operational test beds to see what sort of regulatory intervention was needed (Manson, 2007).

One of the issues tackled in the recent Science 2.0 consultation concerns copyright reform—section 2(c). Here the issue was Text and Data Mining (TDM) and the need for policy interventions. The stakeholder community seems to have felt that TDM was not very important—only 19% of the responses felt there was a need for policy intervention and only 11% felt that this should be done at central EU level. What is TDM and why did the Open Science consultation ask about it?

The European Commission (EC) has been consulting on European copyright reform for a number of years. It was certainly a topic of interest in the Commission of José Manuel Durão Barroso, 11th President of the Commission, who served from 2004 to 2014. The cause has now been taken up by President Jean-Claude Juncker.

What is Text and Data Mining (TDM)? In a digital networked age, the use of automated tools allows researchers to mine huge quantities of information to identify patterns or linkages which will help further research and accelerate the pace of discovery. TDM is the technique which is used to do this. Using TDM tools, it is possible to analyse quantities of text and data that would be impossible in an analogue world. Copyright is important because TDM works by first taking a copy of the relevant material before the analysis can begin. Where materials are freely available in Open Access, with the requisite licence, this is not a problem. The challenges come with commercial material which sits behind a paywall, where a copy needs to be taken to allow TDM to be undertaken (LIBER, 2014a). When the Commission first started stakeholder discussions on the way forward, a separate licencing system was proposed as the solution. Libraries, led by LIBER (Association of European Research Libraries), and followed by the research community, objected to this approach. At the time I was President of LIBER and so understood well the drivers for LIBER's opposition. This was spelled out in a letter to the Commission on the stakeholder dialogue where the signatories expressed their 'serious and deep-felt concerns' about the work of Working Group 4 of Licences for Europe on TDM (LIBER, 2013):

> *"Despite the title, it appears the research and technology communities have been presented not with a stakeholder dialogue, but a process with an already prede-*

> *termined outcome—namely that additional licensing is the only solution to the problems being faced by those wishing to undertake TDM of content to which they already have lawful access. Such an outcome places European researchers and technology companies at a serious disadvantage compared to those located in the United States and Asia."*

LIBER, and those supporting the LIBER position walked out of the Workshop. The Commission responded with a letter which added nothing to the dialogue.

How do other countries around the world deal with TDM? Of all European countries, the UK is alone in having an Exception for TDM in its national copyright legislation. The Hargreaves review of UK copyright frameworks introduced an Exception for TDM for academic purposes (for how this has been interpreted at institutional level, see Holland, 2014). The UK is thus the only European country to have any Exceptions in its legal frameworks for TDM. Whist the Exception helps British researchers and UK collaborative groupings, it introduces levels of complexity for researchers in the UK who collaborate across Europe, because these researchers do not enjoy the Exception. This is, frankly, crazy. For the European Research Area to flourish, all researchers should work on a level playing field. The easiest way to deliver this is to have a pan-European Exception which cannot be overridden by contract or technical protection measures. A lack of clarity around the legality of TDM is inhibiting TDM-based research in Europe is impacting on the competitiveness of European research. There are far more TDM friendly copyright regimes in operation the US, Asia, Canada and the UK. A number of European based research projects have already outsourced their content mining to the US (LIBER, 2014a).

One of the important impacts of Pat Manson's tireless work for digital libraries has been to encourage libraries to step up to the mark and to make their views known in a European context. In her 2007 address to the LIBER/EBLIDA Digitisation Workshop, Pat emphasised the importance of library contributions to the European landscape (Manson, 2007). In particular, she stressed that (for libraries) success would be delivered 'Not only today but into the future—Shaped by common effort not disparate local solutions'. This is exactly the route followed by European libraries along the road of copyright reform, and it is due to Pat and her colleagues in the Commission that libraries now feel confident enough to step up to the mark.

One of the fruits of such insightful comments is The Hague Declaration (n.d.). Whilst Pat was not directly involved in the production of the Declaration, the text drew from the commitment that she and others held that libraries could only deliver solutions by working together towards a common goal. I was honoured to be invited by LIBER to chair the Working Party which ultimately produced the Declaration. The Hague Declaration aims to foster agreement about how to best enable access to facts, data and ideas for knowledge discovery in the Digital Age. By removing barriers to accessing and analysing the wealth of data produced by society, we can find answers to great challenges such as climate change, depleting natural resources and globalisation. In particular, the Declaration stresses that facts themselves and data cannot be copyrighted—these forms of knowledge were never intended to be the subject of copyright legislation. Researchers should have the freedom to analyse and pursue intellectual curiosity without fear of monitoring or repercussions. These freedoms must not be eroded in the digital environment. The Declaration embodies a Roadmap for Action:

- Where copyright frameworks do not currently support such a vision, legislators should immediately work to support the introduction of changes which would allow users to undertake content mining on materials to which they have lawful access.
- Where Exceptions or Limitations are introduced into copyright law to allow content mining, these should be mandatory and may not be overridden by contracts.
- It is unacceptable that technical measures in digital rights management systems should inhibit the legal right to perform content mining.
- There should be no need to sign separate licences to undertake content mining activity, since the right to read is the right to mine where those performing mining activities already have lawful access to relevant content.

At the time of writing (29 December 2015), the Declaration has been signed by 527 organisations or individuals.

A number of academic researchers have stressed that licensing from commercial publishers for TDM is not the right approach. Dr Peter Murray-Rust (University of Cambridge) has been a leading proponent of this view. On 6

February 2014, Peter issued a blog post explaining why he could not accept Elsevier's policy on TDM, which centres in the use of licences (LIBER, 2014b).

- This is licence-controlled TDM. The publishers tried very hard to get Europe (Neelie Kroes) to agree to licences for TDM ("Licences for Europe"). They failed.
- They tried to stop the UK Hargreaves process exempting data analytics from copyright reform. They failed.
- The leading library organizations and funders such as the British Library, JISC, LIBER, Wellcome Trust, RCUK are united in their opposition to licences. This is simply Licences under another head.

Meanwhile, the European Commission has come out in favour of a mandatory Exception for TDM, which cannot be overridden by contract. This was itself one of the recommendations of the Commission's High Level Expert Group on Text and Data Mining, which produced its Report in 2014 (European Commission, 2014). This Report felt that a licensing approach would not cover the multitude of areas where TDM had benefits to offer. Rather, it advocated either a reconsideration of the right of reproduction in copyright law, along with the right of extraction in the database regime. Another option was seen to be a new exception in copyright and the database law. This might take one of two forms: an exception specifically permitting TDM for the purpose of research or an open norm.

In December 2015, the Commission issued a Communication on its plans for the future of European copyright reform (European Commission, 2015b). The Commission announced that it would study options to 'allow public interest research organisations to carry out text and data mining of content they have lawful access to, with full legal certainty, for scientific research purposes'. After so much discussion, research organisations find this a weak response. LERU was particularly scathing. Calling it 'a job only half done', LERU calls on the Commission to introduce a mandatory Exception for TDM, which cannot be overridden by contract or Technical Protection Measures. The scope of the Exception should also be widened to give legal certainty to all those with legal access to content to undertake Content Mining activity. The right to read is the right to mine. In doing so, the Commission would truly create a copyright framework in Europe fit for the digital age.

4. Open Access to Publications

At the ITEC Conference in Brussels in October 2013, Pat gave a presentation on Re-imagining education—and the future classroom (Manson, 2013). Amongst other topics, Pat addressed the issue of Open Education. Pat stressed that the idea of Opening Up Education was about opening up education to the considerable benefits the digital revolution has to offer. She stressed that Open Education had the potential to increase the effectiveness of education, with Open Educational Resources being one of the measures of success in this area. Her Action Plan included two relevant Actions:

- Ensure visibility and accessibility to high-quality European OER
- Making rights and obligations for educational materials under copyright more transparent and easier to grasp

These are visionary actions, but regretfully it is doubtful if Europe has matched Pat's aspirations. The piece on copyright reform may be covered by the Commission's Communication of December 2015, where the Commission has said it will 'provide clarity on the scope of the EU exception for 'illustration for teaching', and its application to digital uses and to online learning' (LIBER, 2014b). The first action, however, certainly in terms of a single high quality European Open Educational Resources remains unfulfilled. The Open Access debate remains largely fixated on research materials. What is the current status of this debate?

An important discussion which has gathered speed in 2015 has been the Business Model underpinning both subscription publishing and Gold Open Access through the payment of Article Processing Charges. In Europe, discussion has been most lively in the Netherlands and the UK, which have official Gold Open Access policies and preferences. Where Gold is the preferred route, there is inevitably a conflict between subscriptions and APC payments because the same content is being paid for twice—once via subscription and again via an APC to make that content openly available to the world. This is known pejoratively as 'double dipping' or, more formally, as Total Cost of Ownership.

In November 2015, LERU (League of European Research Universities) issued a Statement entitled "*Christmas is Over*" (LERU, 2015, 2016). On Gold Open Access, the Statement had this to say:

> *"The Finch Report (The Association of Commonwealth Universities, n.d.; Finch, 2012) in the UK expressed a preference for Gold as the future for Open Access publishing. The move to Gold Open Access publishing has also been adopted by some research funders. To note just two national examples: Research Councils UK,[1] and the NWO, the Dutch research council.[2] LERU is conscious of the burden of the extra costs that are placed on universities and research funders by the payment of both subscriptions and Article Processing Charges (APCs) for Open Access publishing in hybrid journals (journals which contain both subscription and OA content). LERU notes that the costs of Gold APC charges are commonly lower in born OA than hybrid journals and does not understand why this is the case. Clearly there is work which needs to be done to ascertain the reason for this price differential. It is important that the path for transition to an Open Access future is clear and that the allocation of costs is fair and transparent."*

LERU then suggested a number of ways of dealing with this challenge. Some publishers have adopted new Business Models which enable universities and their libraries to offset APCs against subscription costs. This in effect lessens the danger that universities will pay twice for the same content—once for the subscription and once for an APC. LERU called on all stakeholders to discuss such offsetting models and to identify principles by which such offsetting agreements could be reached between universities, procurement bodies, and publishers. The following issues should be included in future discussions and agreements:

- The existing spend of a customer (or a consortium) should be taken as a starting point in negotiations;
- The customer can use the current spending level to "offset" against payment for APCs for journal articles in hybrid journals;
- As part of any agreement, publishers should permit all papers published by university researchers taking up the deal to be made Open Access for no extra charge.

Such an approach would provide a new Business Model for supporting research outputs, allowing ground-breaking European research to have maximum impact in informing future research activity. The Statement has been very influential and is to be presented to the incoming Dutch Presidency of the EU in January 2016. It has (as of 30 December 2015) already been signed by 8400 people and organisations. On 12 October 2015, the EU Commissioner Carlos Moedas and the Dutch Secretary of State Sander Dekker openly

supported LERU's position and called on publishers to change their Business Models (European Commission, 2015c). In December, the fruits of such a call could be seen in the outline agreement that the Dutch universities have struck with Elsevier.[3] The Dutch universities aim to make 30% of their researchers' publications Open Access by 2018 as part of the agreement reached to renew their Big Deal.

For some, however, such offsetting deals are not enough and do not transition research to a fully OA world. This is the theme of the Max Planck White Paper on Open Access transitions, which was published in April 2015 (Palzenberger, 2015; Schimmer, Geschuhn, & Vogler, 2015).[4] This paper argues that what is required is a complete transition to Open Access publishing since there is already enough money in the global publishing system to move from subscriptions to payments based on the APC model, using an average price for an APC of €2000. Indeed, the White Paper suggests that there may be savings to be made.

The White Paper has been both praised as insightful and criticised as at best superficial.[5] STM generally welcomed the affirmation that Gold OA was the future, as this would cement today's commercial publishers into tomorrow's publishing future. What about the future of Green Open Access? If Gold is indeed the future, what will happen to the global network of repositories that has been constructed and interlinked? A key criticism is the lightweight treatment of financial modelling. The White Paper rejects the higher unit APC cost suggested by the Wellcome Trust—around £1,837 (€2,495). This is because the Wellcome will fund APC payments in hybrid journals, where APC rates are higher, whereas the Max Planck will not. Certainly in the UK, it is a matter of academic freedom to be able to choose *where* to publish. This needs to be taken into account in any transition Business Model.

The White Paper praises the SCOAP3 initiative,[6] but does not draw lessons from it. SCOAP3 has worked with a small number of High Energy Physics (HEP) journals to turn them into OA journals. On a global level, discounted APC payments have been negotiated with participating publishers based on the total number of articles published by each country. These costs are then collected at country level proportionally through a route determined by each country representative. For example this could be through a central country funder or divided amongst the institutions which formerly paid subscriptions

for these journals. Using figures provided by CERN, it is possible to show that the UK share of the total costs for SCOAP3 journals was calculated as 6.6% of total HEP output in 2005–2006. Jisc Collections advised that just over one third of the UK share corresponds to subscriptions previously paid. The shortfall was covered by CERN in 2014 as the initiative commenced. In 2015 and 2016, this shortfall (around two-thirds) will be covered by STFC in the UK. Whilst the SCOAP3 team has worked tirelessly to introduce this new Business model, it is hardly a scalable solution which will support the Max Planck White Paper.

There are other issues which the Max Planck White Paper does not address. If subscriptions change to APC payments, it is inevitable that big research universities will share a bigger proportion of the total costs because they produce more research. What is needed is very detailed financial modelling looking at the impacts at country and institution-level. This needs to be done country by country, so that a complete picture can be built of what the transition means in practice. If just one country declines to agree the new model, this will impact on all other countries since they would end up paying more. In the current subscription-based payment model, this does not happen. The Max Planck model takes as read that all academics across the globe will move to Gold OA publishing. This is probably easier in the Sciences and Medicine, but what about the Arts and Humanities? This community has always been nervous of OA. It is not a given that they would immediately accept a global transition in the way envisaged by the White Paper. Finally, will publishers really agree to a diminution in their costs by moving to an APC model which (as the White Paper itself says) may give them less revenue than they currently receive from subscriptions?

The White Paper is a bold attempt to transition to an OA publishing future, but it leaves many questions unanswered. The LERU Statement, however, is a scalable and flexible response to the realities which face research institutions today. It is the place to start. Further work on the White Paper is needed before it can be accepted with confidence.

5. Conclusion

This paper celebrates the matchless contribution of Pat Manson to digital library development in Europe. As Pat prepares for a well-deserved

retirement, the paper examines some of the key questions facing European libraries in 2016. The Framework Programmes on which Pat has worked have helped libraries to develop a European role and presence. The challenge, however, is to secure pan-European agreements and to act together. It is by libraries and European central bodies working in partnership that these developments will become embedded and succeed. Through Pat's support and tireless engagement with the European library community, libraries now have a voice at European top tables. As this paper shows, the challenge for libraries is now to fine tune that voice and deliver infrastructure, policies and services which support Open Science in the twenty-first century.

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Notes

[1] See http://www.rcuk.ac.uk/research/openaccess/; last accessed 30 December 2015.

[2] See http://www.nwo.nl/en/policies/open+science/open+access+publishing; last accessed 30 December 2015.

[3] See https://www.elsevier.com/about/press-releases/corporate/dutch-universities-and-elsevier-reach-agreement-in-principle-on-open-access-and-subscription; last accessed 30 December 2015.

[4] See http://openaccess.mpg.de/2121558/MPDL_Open_Access_White_Paper; last accessed 30 December 2015.

[5] For example, see Crotty (2015), Harnad (2015), Poynder (2015) and STM (n.d.).

[6] See http://scoap3.org/; last accessed 30 December 2015.