Trove and the world: cultural collections in a global environment

Abstract

Introduction

Trove is an embedded part of the Australian information and culture landscapes. Described as indispensable, transformative and revolutionary, Trove has moved from experimental project to ongoing service with a rapidly growing content and user base. Independent and National Library of Australia research is yielding new insights into Trove's role in generating new knowledge, fostering social inclusion, and in developing communities of interest.

However, our understanding of how Trove fits into the international cultural collections discovery service landscape is less developed. While Trove has undoubtedly led this field, it is by no means alone. In the last six years, comparable national or trans-national services have emerged including Europeana, DigitalNZ, and the Digital Public Library of America.

Methods

None of these services are exact analogues of Trove, and this paper will draw out the similarities, differences and overlaps across a number of domains: mission; content; service; user engagement; governance; and supporting business models.

Based on the knowledge developed over five years of developing and maintaining Trove, a literature search and interviews with the leaders of Trove's 'sibling' services, this paper will critically examine the service's different partnership and business models, and consider the ways in which those individual differences reflect divergent policy and social contexts.

Results

The paper will extend beyond this analysis to ask what social, economic and policy contexts – what community values – influenced the scope, shape and flavor of each of these services. What national and trans-national identities are being invoked or modified through these services?

What government, community or private mandates generated and facilitated their development? What conditions favoured or hindered development or may do so in the future?

Conclusions

What are the likely future impacts of the business models underlying each service, with their varying levels of public and private funding? What do these similarities and differences mean in terms of shared directions for work across the portals? Will there be further convergence of purpose and approach? Is it possible that global topics of interest, such as climate change and the movement of peoples across the globe will stimulate cross-portal work?

Relevance

This paper addresses a 'big discovery issue', by exploring the ways in which the framing of discovery 'problems' and 'solutions' is heavily influenced by local social, policy, political, cultural and professional factors. Discovery services are like any other cultural assemblage – inevitably shaped by the environments in which they arise. Understanding these differences is essential as the profession moves beyond national to transnational data sharing relationships.

On January 6, 2015, Ashley Sanders, a digital librarian, American Ph.D. candidate and participant at a thatCAMP associated with the annual conference of the American Historical Association tweeted:

> Everything is constructed, including library and archival catalogs. Understand that construction[1].

At the five year point in Trove's history, the time seems right to take stock, and step back from researcher and public accolades to think about Trove as a constructed product of a particular social, cultural and information landscape, to improve our understanding of how Trove fits into the international cultural collections discovery landscape, and to explore ways in which the national and international contexts might shape Trove's next five years.

Trove is not alone in the world of cultural content aggregator services. Many state based, national and transnational services have emerged in recent years, or are in development. For the purposes of this paper, Trove is examined alongside the three aggregators with whom it is in closest contact and with whom it is most often compared: Europeana, Digital Public Library of America (DPLA), and DigitalNZ.

All four services aggregate metadata describing content from multiple contributors so that users can discover resources through a single portal, and developers can access resources through a single API platform. All are based on a common value of making it easier for the public to access, enjoy and use the collections of cultural institutions. However, there are important differences between the services that reflect the contexts in which they arose, and that are likely to profoundly influence their future development.

Governance

The four services have very different governance models.

Trove's current governance model is entirely internal to the National Library, reflecting the Library's status as the sole funder of the central infrastructure. An internal Trove Reference Group refers matters to the Library's Corporate Management Group which considers Trove's strategic directions, and is responsible for resourcing, legal and compliance issues. The Library's Council has oversight of Trove, as it does of all other Library activities, and receives regular formal reports on Trove issues and developments.

Two additional bodies receive regular 'for information' reports on Trove. The Libraries Australia Advisory Committee is the representative body of Libraries Australia's 1200

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[1] Sanders, Ashley 2015, https://twitter.com/throughthe_veil, accessed 6 January 2015.

strong membership. While Libraries Australia member fees do not support any part of Trove's direct service costs, member fees enable the production and maintenance of the National Bibliographic Database, which is exposed via Trove. Libraries Australia members have described Trove as 'their public datastore'.

National and State Libraries Australasia (NSLA) also receives regular reports on Trove and commissions a small stream of work around the relationship between Trove and DigitalNZ. Australian members of NSLA are major contributors to Trove content, especially in relation to funding its most heavily used content, digitised newspapers; around half of all Trove newspapers content has been digitised with contributor funding.

Europeana has a complex governance model operating across four levels. The Europeana Board comprises up to twenty representatives of European associations of cultural or scientific heritage organisations (of which five are permanent 'founding' members) and up to six Europeana 'Network officers', and is responsible for representing parent bodies, and providing advice on strategy and directions.

The Europeana Foundation – funded by the European Union with matching funds from member states – is an incorporated body responsible for Europeana's legal framework, employing staff, bidding for funding and planning for sustainability. The Foundation is firmly representational: members must represent international or national associations of cultural and scientific heritage association; and the association itself must be a legal entity.

The Foundation has an Executive Committee, elected by the Board, and tasked with creating strategy, setting budgets and overseeing the running of the Europeana office. The current Executive Committee comprises representatives from the library, archives, audio-visual archives and museum sectors.

The Europeana Network comprises a community of experts in digital heritage, and is the membership-based model by which individuals can provide input to various task forces and service directions. Europeana's governance is firmly representational, rather than being based on a broad expertise skill set. However, the size of the representative pool means that wide expertise is available; members of the Network can be voted onto the Executive Committee to bring particular kinds of expertise to the service.

Europeana completed a wide consultation process to arrive at its recent *Europeana 2015-2020* strategy[2]. The plan states that Europeana wants to achieve a 'more transparently democratic organisation'. The need for change is strongly associated with Europeana's need for a changed business model, which will very likely require more direct investment by contributors to deal with significantly reduced EU funding over this period.

Digital Public Library of America (DPLA) is a tax exempt non-profit entity, funded by philanthropists (including the Bill and Melinda Gates Foundation and the Mellon Foundation), and federal agencies (the National Endowment for the Humanities, and the Institute of Library and Museum Sciences). DPLA is governed by a Board which includes public and research librarians, technologists, intellectual property scholars, and business experts from around the country. The Board is 'heavy' on senior library representatives, but is chaired by the CEO of Creative Commons.

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[2] Europeana, 2014, *We transform the world with culture: Europeana strategy 2015-2020*, available at: http://strategy2020.europeana.eu/, accessed 6 January 2015.

DPLA also has a set of Operational Committees, including Advisory, Content Strategy, Legal, Marketing and Outreach, and Technical Advisory Committees. Each Committee has 10-15 'convening members'. In some cases members are also on the Board; in others they work for allied services, e.g. Europeana. Each Advisory Committee has a public email list, and members of the public are invited to become involved.

This combination of Board and Advisory Committees means that at least 50 individuals are directly involved, in some way, in DPLA's direction setting – for an organisation with only 12 paid staff at the end of 2014. The DPLA 'bench' is both wide and deep, and would be capable of fulfilling both representational and expertise roles. DPLA has an interesting policy and practice of 'open Board and Committee calls', based on the governance processes of some US government agencies. Members of the public can elect to be informed about and 'attend' (via an 800 number or video-conferencing facilities) quarterly Board meetings and monthly Committee meetings.

As with Trove (managed and funded by the National Library of Australia), DigitalNZ is managed and funded by the National Library of New Zealand. Advice is provided by the relatively small DigitalNZ Advisory Board, chaired by the CEO of the National Library of New Zealand. The Board is explicitly not a representative body, with the exception of the NLNZ CEO. Other members are appointed based on the expertise they can bring to the service and include one member from Department of Internal Affairs (the Library's home portfolio department), one from the Government Data and Information Re-Use Programme, the Associate University Librarian Digital Services at Auckland University, and two business members; one from a large intellectual property law firm, and the other a small library and learning/web strategy firm.

The role of the Board is stated quite simply:
- Guide strategic thinking and decision-making activity
- Inform work programme priorities
- Encourage DigitalNZ to stretch and maximise its potential

Minutes of Board meetings are made publicly available, as are the work plans that are presented to the Board.

As can be seen, these services, with very similar purposes, have completely different governance models. They cover the full spectrum from extensive contributor representation to no contributor representation, opportunities for end user representation to no opportunities, models based on representation, to models based on expertise, models designed for decision-making, and models designed to provide advice. They are all products of the way the services were initiated and are funded, and of the social and policy contexts in which they have arisen.

The National Library has considerable experience with many different governance arrangements across its current and past activities and services, with some models more successful than others, and some models losing their efficacy over time, and is considering what models might best serve Trove over its next 5-10 years. However, it is unlikely to make major governance changes before 2017, due to the Library's focus on its Digital Library Replacement Project[3].

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[3] This project is the Library's highest strategic priority, and is a major factor in Trove work plans over the period 2012-2017. Information on the project is available: http://www.nla.gov.au/dlir/project-details

Funding

Europeana has arisen in the context of very high Government investment through the European Union and member states, with an overt pan-Europe policy mandate:

> Europeana started 5 years ago as a big political idea to unite Europe through culture by making our heritage available to all for work, learning or pleasure. A deeply felt belief that our shared cultural heritage fundamentally belongs to all of us, and is therefore too important to leave to market forces alone to digitise and make available.

As a Foundation, Europeana publishes its annual accounts. The 2015-2020 strategy states that Europeana believes it 'can run a successful core service for approximately €7million [AU$14.5million p.a] … less than one third of what Europeana and the related projects had to spend on average over the past 5 years'[4]. It reported income of just under €7million, or just less than AU$10million in 2013[5], a low funding year. In addition to this 'core' funding, member states have invested heavily in digitising their cultural collections. Europeana estimates that 10-12% of Europe's cultural collections have been digitised. The National Library has digitised just over 4% of its collections, and believes the percentage of digitised Australian cultural collections is probably at an even lower percentage, well behind what has been achieved with large-scale and targeted funding in Europe.

Nevertheless, Europeana faces significant funding challenges over the next 5 years, with a requirement that the service become self-funding by 2020.

DPLA has arisen in a context of very high private sector support for 'public goods', including funding opportunities to work on scalable issues. DPLA was established and is sustained with a mix of funding from six Foundations and two Government agencies, and recently received grants of almost US$600,000 to research and implement a sustainable business model (Mellon Foundation), and US$300,000 to research and simplify access and use statements across DPLA content (Knight News Foundation).[6] DPLA's recently released Strategic Plan 2015-2017[7], makes clear that the service must achieve sustainability by the end of the 2017 financial year, through a mix of funding sources, potentially including member support.

Trove and DigitalNZ have arisen in contexts in which strong library collaboration has facilitated cooperation within the sector[8], where additional Government appropriation

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[4] *Europeana Strategy 2015-2020*, op cit., p. 24.

[5] Europeana 2014, *Making connections. Annual report and accounts*, available http://pro.europeana.eu/documents/858566/af0f9ec1-793f-418a-bd28-ac422096088a, accessed 6 January 2015, p.47.

[6] Information on DPLA's funding sources, but not its total annual budget is available: http://dp.la/info/about/funding/, accessed 6 January 2015. With 12FTE, DPLA's total budget is likely to be slightly more than the DigitalNZ and slightly less than the Trove budget. Over the last 4-5 years, Europeana's staffing and budgets appear to be at least four times that of Trove.

[7] Digital Public Library of America, 2015, *Strategic Plan 2015 through 2017,* available: http://dp.la/info/wp-content/uploads/2015/01/DPLA-StrategicPlan_2015-2017-Jan7.pdf, accessed 8 January 2015, p. 24.

[8] The decades old Australian Newspaper Plan collaboration by National and State Libraries Australasia was surely a 'necessary condition' for the centralised and highly efficient newspaper digitisation service that has arisen in Australia. Information on ANPlan is available: http://www.nla.gov.au/australian-newspaper-plan, accessed 6 January 2015.

has not been forthcoming, and in which there are few or no sources of competitive Government or philanthropic funding available to fund large-scale digitisation of cultural collections, or to fund new developments within the services. DigitalNZ focuses on keeping its costs low, and as a unit within the National Library of New Zealand can be 'sized' according to available resources.

The National Library has developed and maintains Trove without additional appropriation from Government, and has done so by closing format or sector specific services, reprioritising internal budgets, and – like DigitalNZ – focusing on keeping costs as low as possible. Like DigitalNZ, Trove staffing expands and contracts according to available resources and other institutional priorities.

Newspaper digitisation is funded from the Library's collections budget[9] and through the contributor model, which sees state libraries and others paying the Library a per page charge to digitise and deliver selected newspapers. Some state libraries – notably the State Library of Victoria, and the State Library of New South Wales, with its current Digital Excellence program – have won significant additional funding from their governments to digitise their collections, supporting content growth far beyond what would be possible from within the National Library's own resources.

Until 2014, contributors paid a per page charge for digitisation costs only, with the Library bearing all other costs including storage, management, discovery and end user engagement[10] around this content. The per page digitisation charge now includes a small component designed to support the central service in the year in which payments are made, but there is no ongoing charge to cover service costs in out years.

A particular issue facing the National Library is that it is ineligible to apply for any forms of competitive or 'block' research infrastructure funding (e.g. Australian Research Council grants), and has no other competitive funding mechanisms – Government or private – to which it can apply for investment funding to drive development and innovation. This means that even very high priority service developments can wait several years before funding is available, and that the Library is unable to fund developments that would support specific stakeholder groups. The Library continues to advocate about these barriers to further development.

Content

Europeana, DPLA and DigitalNZ are alike in that they provide access to freely available digital resources from multiple contributors across the Galleries, Libraries, Archives and Museums (GLAM) sectors.

Europeana provides access to more than 30 million resources, contributed by 2000 European institutions from 36 countries, DPLA provides access to more than 8 million resources contributed by 1300 United States institutions, and DigitalNZ provides access to more than 28 million resources contributed by 200 New Zealand institutions. In all cases, the services harvest descriptive metadata using various protocols, and convert the metadata to a common format suitable for ingest into their own databases. The described content continues to be owned, managed and

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[9] The Library has reduced its overseas collecting, and converted a substantial portion of the remainder to electronic collection, in order to free up funds from its collection budget to digitise Australian collections.

[10] In 2013-2014, Trove support team staff answered 3580 enquiries from members of the public, most relating to Trove Newspapers.

delivered by the contributor: digital content itself is not ingested. These aggregators have no long-term stewardship responsibility for digital content, but provide alternative pathways to content delivered via contributors' own websites[11].

These services essentially use the model pioneered by the National Library's Picture Australia service in 2000[12], but with some important differences pertaining to Europeana and DPLA, which harvest metadata primarily from hubs, that is, intermediate aggregators, rather than from single institutions. In the case of Europeana, these aggregators may be at the national level (e.g. Arts Council Norway), clustered around language (e.g. Hispana), culture (e.g. Judaica Europeana) or operate across a single GLAM sector (e.g. Archives Portal Europe).

DPLA harvests metadata from large single-institution 'content hubs' (e.g. the University of California's California Digital Library) and from eleven state or regional service hubs, covering fifteen states (e.g. Mountain West Digital Library, which aggregates content from institutions across four states). DPLA focuses its efforts on encouraging hub development, rather than harvesting from individual organisations. Its newly released Strategic Plan 2015-2017[13] sets out its aim to 'complete the service hub network', and to ensure that every United States library, archive or museum with a digital collection has an intermediate hub available to join. DPLA states explicitly that institutions with fewer than 200,000 digitised items operating in a state without a service hub cannot be 'onboarded', as the peer-to-peer relationships involved are beyond DPLA's capacity to manage.

This is in sharp contrast with Trove which, for most Australian non-newspapers digital content, must work with individual institutions. Trove's smallest individual collections number in their tens (e.g. the Bega Pioneers' Museum, with 47 items in Trove), and many contributions number between a few hundred and a few thousand items. The only 'hubs' operating in Australia are Libraries Australia (see below), the Australian National Data Service's Research Data Australia[14], which provides access to datasets managed by individual universities, and Victorian Collections, a shared digital content management system used by hundreds of small to medium museums in Victoria[15]. With this last exception (which covers a single part of the GLAM sector only), there are no state-based hubs, aggregating digital content from multiple sectors within the state. There are no single sector based hubs, aggregating digital content from a single sector across the nation; Collections Australia Network, which focused on museum collections, proved unsustainable and was closed in 2014, after the Cultural Ministers Council withdrew funding in 2011[16]. While the National Library previously operated format based services, including Picture Australia, Music Australia and Australian Research Online, these have all been closed in the interests of concentrating investment in Trove.

There are no signs that state-based hubs are likely to emerge in Australia, or that public or private investment will be made available to develop or sustain single sector

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[11] This may change if Europeana pursues its European Cloud concept, see *Strategy*, op cit, p. 24, which describes 'premium' services for investors, and a Cloud service that would allow contributors to 'move quickly from their legacy' systems.
[12] Picture Australia was released in 2000, and closed in 2011, after its content was migrated to Trove.
[13] Digital Public Library of America, 2015, *Strategic Plan 2015 through 2017*, available at: http://dp.la/info/wp-content/uploads/2015/01/DPLA-StrategicPlan_2015-2017-Jan7.pdf, accessed 10 January 2015.
[14] Available at: http://researchdata.ands.org.au/
[15] Available at: http://victoriancollections.net.au/
[16] See 11 June 2014 news item available at: http://mgnsw.org.au/sector/news/can-close/

hubs in the future. This effectively means that the National Library of Australia is the only Australian entity aggregating cultural collections at scale[17].

DigitalNZ also harvests metadata direct from its 200+ individual contributors, as was the case with Picture Australia.

Trove's content base is much more diverse and complex than any comparator services. In addition to aggregating metadata describing digital resources delivered by third parties, Trove's almost 400million resources includes:

- metadata describing non-digital resources that require additional steps for access. Most of this metadata is sourced from Libraries Australia, used by more than 1000 Australian libraries for their collection management needs. Trove provides a national, publicly available front end to these library collections, adding additional value to Libraries Australia members by making their collections more easily discoverable[18];
- metadata for licensed digital resources from two eResource publishers: Gale; and RMIT Publishing. Users discover articles via Trove, but can only access and use the article if they are a member of a subscribing library, or are willing to pay a per article fee. When this aspect of Trove was developed, the Library hoped to increase the stable of eResources discoverable through Trove. However, as the costs of doing so became more apparent, the Library decided not to expand this part of the service, and it may contract further in the future;
- metadata from non-Australian aggregator services, specifically OCLC's OAIster and Hathi Trust. Both inclusions are under review, primarily because of the difficulties involved in making it clear which resources are available to Australian users[19];
- and of course, Trove delivers more than 15 million pages (150 million individual articles) of digitised Australian newspapers.

The Library is responsible for long-term stewardship of and access to digitised newspaper content. Newspaper delivery is 'tightly coupled' into the current Trove discovery service, but will be redeveloped to be more modularised in the next few years. While this change should be invisible to the end user, it will provide more development flexibility into the future.

'Trove' is also now the delivery and marketing banner for other forms of the Library's own digital content. The Library is part-way through its multi-year Digital Library Infrastructure Redevelopment project. The Library's new digital delivery system is branded Trove, and its user engagement (annotations) features – such as text

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[17] The HuNi (Humanities Networked Infrastructure) service recently developed under the auspices of NeCTAR (National e-Research Collaboration Tools and Resources) funding scheme, and stewarded by Deakin University, claims to be' the biggest humanities and creative arts database ever assembled in Australia'; with 2million records. Trove includes almost 400 million records at January 2015 and includes many of the data sources included in HuNI, which is available: https://huni.net.au/#/search.

[18] Libraries Australia runs on a near cost recovery basis, with the Library contributing an average of 8-10% of its annual running costs over the last 5 years. While Libraries Australia members rightly feel a strong sense of pride and ownership of Trove, their member fees do not support any part of Trove's costs.

[19] The Library is reviewing inclusion of OAIster resources, as the size of the database (30 million resources) 'floods' Trove with non-Australian content, with users advising that they find it difficult to find and navigate to Australian resources. Similarly, the Library is reviewing the scope of Hathi Trust inclusion, as many of the nearly 13 million Hathi resources are not available to Australian audiences for copyright reasons.

correction, commenting, and tags – are common across the service. This is a marked departure from the past, where the two brands – Trove and the National Library of Australia – were quite distinct. By 2017, all National Library digital delivery systems will be branded Trove, and share a common set of navigation and annotation features.

The portals – look, feel, culture

Europeana's pan-European ethos is nowhere more apparent than in a blog post appearing on the home page in January in the aftermath of the Charlie Hebdo massacres: 'Freedom of expression: the heart of our shared cultural identity'.[20] The post begins 'One of the central tenets of our shared European culture is the freedom of speech and cultural expression' and ends 'Continuing our role as trusted guardians of and ever widening access to the works that represent that freedom, today and for future generations, is our response'. It is almost impossible to imagine either Trove or DigitalNZ publicly offering such a sentiment – even in very dark days – despite being based on broadly similar values, and similar pride in national identities.

Along with prominent blog posts, Europeana's home page offers a simple search, a curated view of 'highlights' from its collections, and information on featured items and featured partners.

DPLA also offers collection highlights on its homepage, together with links to exhibitions – but it also offers users several different ways of approaching its content, with very attractive maps-based, timeline and 'bookshelf' views available directly from the home page. In itself, this emphasis on 'beyond search' stresses DPLA's commitment to the possibilities offered by its API, and its sense of itself as a platform for innovation, not just a portal for discovery.

 DigitalNZ and Trove, by contrast, present users with workman-like search interfaces, and – in the case of DigitalNZ – a small selection of curated sets on the homepage. While both services are intensely interested in the opportunities for different views of their content – especially place and time-based views – neither has yet been able to invest to make this happen. Neither homepage is explicit as to vision, purpose, or 'mandate', and it could be said that both services aim to get 'out of the way' of the user and get them to relevant content in the shortest possible time. While some of this workman-like approach is the result of very limited resources, it also speaks to an essential pragmatism that might be said to be characteristic of both national identities, and perhaps to the pragmatism of the Australian and New Zealand library professions, rooted in decades of collaboration and working together – over long time periods – to improve citizens' access to information resources.

Exhibitions and curated views

Europeana has several 'spin-off' sites, one of which is their Europeana Exhibitions[21] portal, which provides links to virtual exhibitions delivered directly via the Europeana exhibition platform (e.g. Untold stories of the First World War), or as links to virtual exhibitions on partner websites (e.g. the European Library's Napoleonic Wars).

[20] Available at: http://blog.europeana.eu/2015/01/freedom-of-expression-the-heart-of-our-shared-cultural-identity/, accessed 15 January 2015.
[21] Available at: http://exhibitions.europeana.eu/

These exhibitions are professionally curated, with cultural content 'illustrating' exhibition themes.

DPLA also has a (more modest) exhibitions stream, integrated into its main website. DPLA exhibitions (e.g. The golden age of radio in the US) are curated by DPLA staff, and delivered via the DPLA exhibitions platform. Like the Europeana platform, it handles several 'layers' of content, so that users can drill down into exhibition sub-sections of themes.

Neither Trove or DigitalNZ offers this level of sophistication – but they do offer user-curation, which the other services do not. In both services, it is possible to collate groups of content, through the DigitalNZ 'sets' and Trove 'lists' functionality. These services support only simple lists – no nesting - with creators able to add some text about the list, and in Trove's case, some text about each item in the list. Trove lists offer additional functionality, in that they can be kept 'private' or made 'public'. All content in Trove lists is searchable, and available through the Trove API.

The Trove lists functionality is essentially outward-facing, designed to give users an easy way to keep content of interest together. It is also overwhelmingly a user-driven activity, with more than 42,000 lists currently available, of which only a tiny fraction have been curated by Library staff. Nevertheless, this curation element has been exploited by the Library. For example, curated content which shaped Australia Dancing entries and Music Australia 'themes' was recreated in the form of Trove lists. In a more recent experiment, Library staff and a Trove volunteer curated lists to amplify the content displayed in the Library's First World War exhibition, Keepsakes[22], and a set of these lists were converted for display on iPads within the exhibition. In a similar vein, DigitalNZ has invited leading New Zealand 'creatives' to curate their own sets around specific topics.

While Trove lists and DigitalNZ sets offer basic functionality and a 'vanilla' experience, both could potentially be expanded – with additional investment – to offer enhanced support for exhibitions curated by professionals and members of the public.

Community engagement

All four services provide opportunities for community engagement, with some overlaps and some divergences.

Trove's community engagement is principally via its suite of digital user engagement features, of which correction of text generated by OCR processing of digitised newspaper images is best known. At December 2014, the Library calculated the total value of text correction at AU$24.9million, representing around 382 work years. Members of the public have corrected almost 150 million lines of newspaper text, with the most prolific text corrector, John Warren, reaching the 3 million lines milestone by the end of 2014. While text correction is the best known form of user engagement, the Library also sees consistent growth – of between 10 and 15% per

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[22] Information about the exhibition is available: https://www.nla.gov.au/exhibitions/keepsakes, and accompanying Trove lists are at:
http://trove.nla.gov.au/list/result?q=%22Keepsakes+Australians+and+the+Great+War%22. Trove lists are also incorporated into a set Digibooks, created by the Library for the ABC Splash website. In a twist from digital to physical, a very large set of high resolution images of newspaper pages is displayed in the Australian War Memorial's refurbished World War 1 galleries.

annum – of its other offerings, including the ability to tag, comment, add images via Flickr, and create lists.

DPLA's most overt community engagement is through its very open governance model, regular webinars, and in particular through its 'Community reps' model[23], in which individuals volunteer to community engagement and collaboration.

Europeana has placed a heavy emphasis on face to face engagement with potential user communities. During 2013 and 2014, for example, Europeana staff visited many towns across Europe with a program that saw citizens providing their own 'digital memories' to enrich the Europeana 1914-1918 spin-off site [24]. While Trove staff receive many requests to speak to local audiences about the service, resourcing constraints mean this is rarely possible, and the National Library relies on local public library services to let their patrons know how to use and get the most out of the service.

 DigitalNZ held 'Mix and mash' competitions[25] in 2010, 2011 and 2013, with an emphasis on encouraging school-aged users to tell their own stories of past, present and future New Zealand through creative re-use of content sourced from DigitalNZ.

The National Library of Australia provides support for engagement with the developer community, via NSLA's involvement in GovHack and, in 2014, a THATcamp held at the Library. GovHack 2015 will be expanded to include New Zealand government data sources, offering the potential for fruitful developer efforts over the Trove and DigitalNZ data stores.

Unsurprisingly, all four services make heavy use of social media to promote the services and engage with members of the public. All services use Twitter, and have blogs[26], Europeana and DPLA post almost daily to their respective Facebook accounts, and there is some experimentation with both Instagram and Pinterest. As with cultural institutions more generally, the aggregator services all need to decide how many social media channels they can support, and which have the potential to extend audiences in new directions.

Open access

All services are focused on an open access agenda DigitalNZ summarises succinctly as 'Make it easier for customers to know what content is reusable'[27].

This simple aims raise a number of complex issues around licensing, metadata, communication, and technology. The lack of uniform, comprehensible and machine readable licences for contributed content hobbles some Trove opportunities and possibilities. In Australia, open access requirements introduced by the Australian Research Council (ARC) and the National Health and Medical Research Council

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[23] For further information on the Community reps program, see: http://dp.la/info/2015/01/15/apply-to-dpla-reps-third-class/

[24] See a partial list of 2014 family history roadshows on the homepage, available http://www.europeana1914-1918.eu/en, accessed 6 January 2015.

[25] Information on the competition is available: http://www.mixandmash.org.nz/

[26] The Library's Trove blog, available at: http://www.nla.gov.au/blogs/trove received more than 4000 pageviews in the last quarter of 2014. By January 2015, Trove Twitter account has more than 8400 followers, with Trove tweets regularly appearing in Measured Voice's list of top government tweets. A daily list of top tweets is available here: http://oztweets.measuredvoice.com/

[27] DigitalNZ, *Strategic Drivers*, available at: http://www.digitalnz.org/about/plans-and-reports/strategic-drivers

(NHMRC) provide a particular opportunity. Under this new policy, researchers are expected to make the outputs of grant-funded research available through open access repositories, and to attach grants identifiers to publication records.

Trove harvests data from 39 of Australia's 40 institutional repositories and is already possible to search this content by grant identifiers to find publications that were funded by the ARC/NHMRC, or the result of a particular grant. Trove has started discussions with the funding agencies about further possibilities for using the Trove API in research analysis. However, Trove's ability to respond to these more nuanced needs is limited by licensing issues and agreements, and by metadata quality. The metadata that is made available for harvest does not allow clear identification as to whether research publications are freely available online, or under what licence conditions they are made accessible. This is a problem shared by all other aggregators.

The National Information Standards Organisation released its practice guidelines for *Access Licence and Indicators* in January 2016[28], which suggests a number of metadata elements to overcome much of the uncertainty around access and use. If these elements were used by Trove contributors, new facets and indexes could be implemented to help users to find and use open access content.

The Library's capacity to dedicate resources to working with contributors to standardise their access conditions is limited. Nevertheless, every interaction with a contributor can be used as a 'teachable moment' and an opportunity to convey the practical benefits such changes would deliver. A communication strategy for contributors is in development, and more targeted conversations with Australia's research agencies and the Australian Open Access Support Group should yield improvements in this area over time. In addition, the Library – and Australian researchers, users and creators – should eventually benefit from funded access research projects at both DPLA[29] and Europeana.

The role of the API

General public users of these four services all focus on their branded portals; they think of Trove as the Trove website, Europeana as the Europeana website etc. However, for all four services, the API – which provides machine access to metadata, and, in the case of Trove, to digitised newspaper pages and accompanying full text – is an essential part of the service offering. Tim Sherratt's statement that 'portals are for visiting, platforms are for building'[30] has become a rallying cry for aggregators seeing the potential of their APIs to drive innovation, and for digital humanists engaging with data in new ways.

However, each service introduces and emphasises its API in different ways. The Trove portal has only a discreet link to the API on its homepage, with more extensive information about the API available in the Trove Help Centre. This is less about any deliberate policy on the Library's part, and more about the complexity of changing the current Trove home page design, which is tightly coupled to its underlying data

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[28] NISO 2015, *Access Licence and Indicators*, available: http://www.niso.org/workrooms/ali/, accessed 16 January 2015.

[29] DPLA identified that the 8.4million digital resources it makes available are accompanied by more than 26,000 different access and use statements.

[30] Sherratt, Tim 2013, 'From portals to platforms: new frameworks for user engagement', available at: http://www.nla.gov.au/our-publications/staff-papers/from-portal-to-platform.

stores, and therefore has remained static for several years[31]. The possibilities of the API are highlighted and showcased through National and State Libraries Australasia (NSLA's) support for recent GovHack competitions, which use the Trove dataset via the API[32].

The Europeana portal is similarly discreet, with a link to its API information at the bottom of the home page, but its 2015-2020 strategy places a heavy emphasis on its APIs as vehicles to drive innovation, creativity and commercialisation – especially in the tourism field. DigitalNZ shines a similarly low-key spotlight on its API – but also holds regular competitions encouraging creative re-use of content found via the service.

DPLA, by contrast, puts its API and resulting apps front and centre on its home page, stating clearly that 'DPLA is a platform', and promoting the innovation potential of the API: 'Developers make apps that use the library's data in many different ways'.

All four services are now at the point where their APIs themselves need attention. In 2014-2015, for example, the National Library hopes to improve the Trove API (in response to user feedback), implement versioning control, and develop tools to support tracking of use of the API (currently a completely manual process). Europeana has released an experimental Linked Open Data API, making a subset of data available via Linked Open Data Downloads and Sparql endpoint.

Use and impact

Trove received more than 24 million visits in 2013-2014, and regularly has more than 50,000 unique daily users. Usage figures have been harder to establish for the three comparator services, and in any case, visit figures say little about the impact these services are having for their communities.

The Library commissioned an evaluation of user satisfaction in 2013[33], and – like Europeana – aims to assess service impact using a framework inspired by Simon Tanner's Balanced Value Impact Model[34]. Europeana's Strategy 2015-2020 makes clear that – like the National Library of Australia - the organisation has commissioned qualitative research. It has also commissioned research to calculate potential economic impact and the investment required to bring this potential to fruition[35], something the National Library has not yet been able to fund but hopes to advance in the next few years.

This field of 'impact' assessment will undoubtedly drive significant analysis and research activity at all four services over the next few years, in an environment where public and private sector funders want solid evidence of the outcomes of their

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[31] In the 2014-2015 year, the Library will review Trove's current 'zone' approach, and commence both redevelopment of the service structure, and a move to Twitter Bootstrap to enhance opportunities for more regular refreshes of the home and other pages.

[32] Information on the GovHack project is available: http://www.govhack.org/ In 2014, Trove was voted best government data source by developers.

[33] Some results are outlined in the author's presentation at the ALIA 2014 conference, 'Trove at 5: are we there yet?', available at: http://www.nla.gov.au/our-publications/staff-papers/trove-at-5are-we-there-yet.

[34] Tanner, Simon 2012, *Balanced Value Impact Model*, available: http://www.kdcs.kcl.ac.uk/fileadmin/documents/pubs/BalancedValueImpactModel_SimonTanner_October2012.pdf.

[35] *Europeana Strategy 2015-2020*, op cit, p. 19.

investments, but the cultural collections sector's capacity to provide this evidence is relatively immature.

Where to next?

As the preceding discussion demonstrates, one aggregator is not necessarily like another. Europeana stands out as emanating from a 'big political idea', with an explicit cultural mandate from both national governments and the European union. The big question for Europeana in out years is whether this big idea is matched by engagement with and commitment by the public, and whether the perceived value of 'local' services outweighs the pan-European vision. Similarly, while DPLA is also founded on a 'big political idea' – a 'strong public option' – it remains to be seen whether the portal – and its API platform – gain traction in an environment dominated by the world's giant commercial internet services, and in which a 'pan-US' view may not gain the support of the general public.

Trove and DigitalNZ have more Antipodean and perhaps more pragmatic aims, with Trove merely describing what it does ('helps you find and use resources relating to Australia'), and DigitalNZ similarly under-stated ('We aim to make New Zealand digital content *more useful'*)[36]. With less in the way of political ideas, less investment, less value-added website elements and less public involvement in governance, these services have nevertheless been adopted enthusiastically by their national user bases, in addition to researchers across the world. Nevertheless, the absence of a clear Government mandate about the value of digital collections, the value of access to national digital collections by its citizens, and the value of aggregator services does hamper development. Similarly, lack of additional appropriation or access to competitive grant-based programs for development funds means that both Trove and DigitalNZ can only implement their aims incrementally, and may lack the investment required to innovate both in service developments and relationships with broader audiences.

Trove, Europeana and DigitalNZ are all mature services, looking to build on what has been achieved over the last five years or so, and to innovate for their users. DPLA – while a little further behind – is similarly consolidating its position and sketching out its intentions for the next five years. In 2020, where will these services be? Who will use them, and for what? Who will fund them? And who will govern them? The answers to these questions certainly lie in the particular social, policy, funding and cultural environments in which each service arose, but only time will tell whether the next five years brings further convergence, or further divergence – and whether new players will change the aggregator environment in ways not yet imaginable.

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[36] See 'About' pages for both services, Trove at: http://trove.nla.gov.au/general/aboutand DigitalNZ at: http://www.digitalnz.org/about