

SHARING AND SAVING: CALCULATIONS TOWARDS AN AUSTRALIAN PRINT REPOSITORY

Paul Genoni

School of Media, Culture and Creative Arts
Curtin University of Technology,
Perth Western Australia
P.Genoni@curtin.edu.au

ABSTRACT

This paper reports on current research that is assessing the potential space savings that can be made if Australian academic libraries adopt the use of a national repository for the storage of legacy print collections.

A critical element in decisions related to the adoption of a national (or other form of federated) repository is the calculation of the amount of shelf and floor space that libraries might potentially retrieve for other purposes. This paper reports on data derived from a collection overlap study based on members of the CARM Store, plus loan data from several Victorian academic libraries, in an attempt to estimate the possible impact of a fully implemented national repository.

INTRODUCTION

Research libraries have long depended on remote, high-density storage to deal with expanding collections and lack of storage space in their principal library site (Block 2000). Increasingly remote storage is seen as a strategy used not only as a necessity required to manage local space shortages, but also as a means of reducing the high cost associated with indefinitely storing low use print material. For many libraries it is apparent that the long established but expensive model of storing little-used materials 'just-in-case' they are required is becoming unsustainable. The savings made by libraries using remote storage has more than compensated for the inconvenience incurred by some users as they face a wait in accessing stored items.

The pressure to minimise long-term storage costs has led libraries to embrace ways in which the expenses associated with remote storage can be further reduced. This has been achieved in two ways. Firstly, by the implementation of increasingly high-density forms of storage; and secondly by libraries collaborating in order to share the costs associated with acquiring, managing and maintaining a storage facility. This has resulted in a steady rise in the number of collaborative or 'federated' storage facilities, sometimes referred to as print repositories. The use of print repositories is a strategy that not only reduces the space and cost pressures associated with long-term print storage, but it can also benefit users by optimising the efficiency of discovery and delivery of low use print material. This has led to the implementation of national print repositories in several European countries (Vattulainen 2004; Henden 2005), and to other countries implementing increasingly broadly-based regional repositories.

Despite the apparent benefits to be gained from federated print storage, there are, however, issues that to date have prevented this solution from being implemented in Australia. Some of these issues are related to the relationships between the nation's research libraries and their access to government funding for research infrastructure (Genoni 2007); and perhaps others have more to do with pride in collection size and lingering competitiveness between institutions. There is also another set of issues, based around the uncertainty of the extent of the benefits that might be delivered by a broadly-based print repository. The purpose of this paper is to explore this latter issue—in particular, to attempt to calculate, in broad terms at least, the potential savings that might be made in terms of space if libraries were to implement a national print repository as a means of federating remote storage and maximising de-duplication between collections.

RECENT INTERNATIONAL STUDIES OF FEDERATED STORAGE

The rising interest in long-term print storage has been evidenced by a recent series of major international reports on the issue. These reports have been unequivocal in their support of the concept of collaborative print storage.

In the United States Bernard Reilly (2003) undertook a study on behalf of the Council on Library and Information Resources. He noted the increased use of repositories in the US, reporting the details of a number of examples that had developed on either a geographic (state) or shared interest (consortium) basis.

Cooperative action was often prompted by the simultaneous recognition of a shared need for storage space on the part of state systems or existing consortia. In most cases, the repositories were the response of governing authorities to a system-wide space crisis . . . (Reilly 2003, p.6)

Reilly surveyed the current print storage practices of US research libraries in the context of international (particularly European) moves towards large-scale repositories, some of which were implemented on a national basis. He concluded that:

With the appropriate resources in place, one could imagine the major North American research libraries, regional repositories, and national-level repositories linked in a network that enables strategic management of the important primary resources for scholarship. (Reilly 2003, p.40)

In 2007 Lizanne Payne prepared a report commissioned by OCLC, *Library Print Facilities and the Future of Print Collections in North America*. Payne investigated the current print storage activities of North American academic libraries, reporting that there were some 68 high-density storage facilities (both independent and shared), housing in excess of 70 Million volumes. She believes that:

. . .high-density library storage facilities have moved into the mainstream for collection management in academic libraries, and that this is the optimum time for the academic and library communities to leverage this collective capacity to develop a broader, system-wide approach to maintaining print collections across institutional boundaries. (Payne 2007, p. 5)

Payne's argument is built on the efficiencies in storage, discovery and delivery that are obtained from collaborative repositories, and she raises the question as to the appropriate scale of the 'system-wide approach'.

Academic institutions and the libraries that serve them could provide lasting benefits to scholarship and economies to their institutions by proactively developing a network of print repositories on a regional, national, or even global scale. (Payne 2007, p. 26)

The Association of Research Libraries (ARL) has also sponsored recent research in the US (Deardorff & Aamot 2006) with a view to reporting on the evolving space utilisation by member institutions. The data collected in the survey updates previous similar surveys conducted under the auspices of the ARL (Cornell University Libraries 1978; Steel 1990; Merrill-Oldham & Reed-Scott 1998). The most recent of these reports notes that, consistent with conclusions reached by other observers (Pastine *et al.* 1999; Chepesuik & Weeks 2002; Payne 2005), US research libraries are relying increasingly on remote and federated storage as a means of addressing space shortages.

ARL member libraries' use of remote shelving facilities as a response to space needs has increased since 1998 and, judging from the responses to this survey, this trend will continue. Another upward trend is the use of shared facilities . . . (Deardorff & Aamot 2006, p. 15)

A further North American survey of print repositories has been recently commissioned by the Canadian Association of Research Libraries Committee of Scholarly Communication (Canadian Association of Research Libraries 2006). The survey described 'the more prominent Canadian university library print repository initiatives' (p. 3). These included eight single university repositories and four consortial or shared repositories. The report indicates a recent trend towards larger scale repositories. The two shared repositories established in the 1990s had two and three members, while those being established at the time of the report consist of 20 (Ontario Council of University Libraries: Collaborative Collection Continuity Initiative) and 17 (Council of Atlantic University Libraries: Atlantic Regional Consortium for the Preservation of Scholarly Materials) members.

In the UK, the Higher Education/ British Library Task Force commissioned a 2001 report on future storage options (O'Connor *et al* 2002). The report noted the 'powerful theoretical arguments for the development of collaborative storage facilities over the last decade along with a strong and developing practice toward the end of the last decade' (p. 16). CHEMS Consulting subsequently undertook a survey in 2005 on behalf of the Consortium of Research Libraries in the British Isles (CURL) and the British Library. The responding libraries consisted of 38 higher education libraries and four large municipal libraries. Extrapolating from survey responses received from the higher education libraries, the report calculated that the total sector would suffer a shortfall of storage capacity of up to 455 linear kilometres by 2015 (CHEMS 2005, p. 47). The report further estimated that the capital cost of providing space to meet this shortfall would be 103 million pounds.

As a response to this impending crisis CHEMS Consulting recommended a model for a national collaborative storage strategy, which is being adopted in stages. The creation of the 'UK Research Reserve' is based on the existing lending collections of the British Library supported by a group of six academic research libraries. Phase 1 of the project (running from January 2007 to June 2008) has focused on journals. The projected Phase 2 will invite the participation of other research libraries and possibly expand the scheme

to include monographs (Wright 2007). With both journals and monographs the intention is to ensure the preservation of a designated number of copies within the Reserve. Substantial freeing up of space can occur as libraries de-duplicate, confident that items in the Reserve can be borrowed as required and will be retained in perpetuity.

The issue of print storage, including the prospect of creating collaborative repositories, has been debated in Australia over the past decade (Genoni 2007). The Council of Australian University Librarians (CAUL) in particular has considered the matter, and their deliberations included convening a National Cooperative Store Workshop in 1999 (Council of Australian University Librarians 1999). The matter was actively before CAUL until 2004, when the momentum dissipated amidst internal disagreements and pessimism regarding the prospect of government funding. The matter of Australian print storage has, however, continued to receive attention from outside CAUL (O'Connor 2004; Genoni 2007; Genoni 2008; Jilovski & Genoni 2008).

AUSTRALIAN COLLECTION OVERLAP STUDIES

If Australian research libraries are to support the creation of a national print repository it would be with a view to achieving savings in the cost of long-term storage of print material, and in producing benefits to researchers by creating efficiencies in the digital discovery and delivery of print items.

Calculations regarding the extent of the space savings that might be made with regard to long-term storage depend on two factors. Firstly, the space saved by implementing state-of-the art high-density storage systems; and secondly, the potential to de-duplicate collections and permanently dispose of material. In both regards the calculations involved are difficult and necessarily require a degree of informed guesswork. As will be examined, estimates must often be made by relying on incomplete data and on various suppositions regarding local demand (e.g. whether a library can afford to surrender a locally held copy). The problem of making accurate assessments has been experienced elsewhere. The Higher Education/ British Library Task Force report had acknowledged that although it appears to be 'intuitively true' that national or regional repositories will reduce storage costs, it is nonetheless 'difficult to uncover any cost/benefit analyses of cooperative or collaborative storage' (O'Connor *et al* 2002, p. 265). The CHEMS report made a similar point, noting that the creation of a national repository was being recommended despite there being 'no available evidence of the amount of de-duplication and space saving that could be achieved' (CHEMS Consulting 2005, p. 14). In the absence of calculations regarding potential space savings the cost-benefit analysis of collaborative storage is necessarily speculative.

The data that can be used as the basis of such calculations is that which measures collection overlap and thereby provides information on the potential for deposit and de-duplication. There have been several overlap studies undertaken in Australia in recent years that provide useful background data regarding duplication of monographs. The first of these was a National Library of Australia study undertaken in 1994 (National Library of Australia 1996). The study included monographs only and was conducted using a sample of 476 titles (a sample acknowledged in the subsequent report as being 'small') that had been added to the national bibliographic database (NBD) twelve months previously. As is often the case with overlap studies the results were open to

differing interpretations. In this case the NLA report noted that ‘each title on the NBD is likely to be owned by only four or five libraries’ (the average holdings per title was 4.4), but it was also the case that 10.9% of the titles in the sample were held by ten or more libraries. In the absence of benchmarks it is difficult to know if these figures constitute a ‘good’ or ‘bad’ result in terms of overlap. Over a decade later, however, it means that there is at least significant potential for de-duplication, with those 476 titles represented by *up to* 2090 holdings in the NBD.¹

In 2002 the NLA was commissioned by the Department of Education, Science and Training (DEST) to conduct a survey of collection overlap between Australian university libraries. The compilation of the overlap data was said to be important as part of the information gathering that could ‘assist decision-making in a range of areas including co-operative storage ventures’ (Missingham & Walls 2003, p. 248). The survey included both monographs and serials, with the NBD records and holdings statements again serving as the data source. The account of the research warned however, that; ‘Data quality is an issue which needs to be noted’ (p. 252), largely due to the duplication of records and the incompleteness of the holdings data.

The report itself concentrates more on describing the levels of unique holdings than on the degree of overlap, and the evaluation of the data is presented on a state-by-state rather than a national basis. Therefore, despite the conclusion that ‘there is a high degree of uniqueness among collections of academic institutions’ (p. 255), there is again no yardstick as to what constitutes ‘high’ or ‘low’ with regard to the number of unique holdings on a state basis. Indeed another reading of the data reveals the extent of the overlap. For example, although the report reveals there were 6,675,693 monograph titles that were unique *within a state*, there were also 5,272,884 holdings that were duplicates *within a state*.² The number of duplicates would inevitably be significantly greater if calculated nationally, and it is apparent that as local demand declines for many titles as they age, the scope for de-duplication will be considerable.

A second major DEST supported study with an overlap component was also undertaken in 2002 and 2003. This was the Australian Research Libraries Collection Analysis Project (ARLCAP), which analysed the collections of the ‘Group of Eight’ university-based research libraries and the NLA, focussing on collections from the humanities and social sciences.

In a survey of 412,120 monograph records that were within the subject scope of the ARLCAP study and had holdings for at least one of the participating libraries, it was found that 158,412 (38.4%) were uniquely held (80,565 by the NLA and 77,847 by the combined university libraries). For these records there were, however, some 791,827 duplicates held by the nine libraries, with an average of fractionally over 3 (3.003) holdings per record.³

¹ There is some speculation involved here in that it is *possible* some degree of withdrawal may have already occurred, as it is clear that university libraries are relying heavily upon withdrawal to manage space demands (Genoni 2008).

² This figure is extrapolated from Table 2 on p.252 of the report (Missingham & Walls 2003).

³ These figures are extrapolated from the Tables on pages 18 and 24 of the report (Australian Research Libraries Collection Analysis Project 2004) and omitting the data from the School of Oriental and African

Consideration was given in the ARLCAP report to various future cooperative scenarios for building national research infrastructure, including storage of legacy print collections. The two key scenarios were based on the 'Nationalist approach', which 'has as its main objective to make Australia as independent as it can be in its research information provision' (p. 41); and the 'Internationalist approach', which is 'dominated by the notion that overseas . . . collections are, and always will be, much greater than Australian collections, and that the number of items that are unique in Australia is so low that the most cost-effective strategy is to rely entirely on providing access to these collections rather than replicate them in Australia' (p. 42). The report found that an implication of choosing the nationalist approach would be that:

Storage facilities should be established to ensure that now and in the future no titles held in Australia should be discarded. These facilities might involve existing infrastructure or might involve the creation of new ones. (p. 50)

The ARLCAP report also concluded that:

There is no evidence from the study that widespread relocations of stock between libraries or to a shared storage facility, other than the transfer of stock to the National Library, would be a cost-effective enhancement of the research infrastructure' (p. 47).

On the basis of the data presented in the report it is not possible to see the *evidence* or justification for this conclusion, as the study made no attempt to establish what might be meant by 'cost-effective' in this context. There is no assessment of the cost associated with long-term duplicated storage of low use material, or of the effectiveness of discovery and delivery of such material in a widely distributed system.

A further conclusion from the ARLCAP study was more sustainable; that is, that, 'Any national storage facility cannot sensibly be restricted to the higher education sector' (p. 47). This is an acknowledgment of the important role played by the collections of the NLA (the survey found that their collections in the relevant subject areas were 56.4% unique for monographs), but also of the potentially important roles to be played by the 'state libraries, CSIRO and even some special libraries' (p. 47). In a similar vein the report also concluded that,

The closer the cooperation between the [Group of Eight] libraries and between them and the National Library in collection development, management, discovery and delivery the more effective the national research infrastructure will be. (p. 39)

STUDY OF CARM MEMBER OVERLAP

The aim of the present research is to undertake estimates of the amount of space that might *potentially* be 'saved' if Australian research libraries were to commit to a fully implemented national print repository. 'Fully implemented' in this context refers to a repository in which;

- ownership of deposited material is transferred to the repository;
- the repository commits to the permanent retention of deposited material;

studies at the University of London, which was included as a point of comparison with a leading international collection.

- access to stored material is guaranteed and supported by state-of-the art discovery and delivery systems.

These features are necessary in order to achieve optimum storage densities and to encourage participating libraries to de-duplicate their local collections.

Neither of the two major Australian shared storage facilities has yet met these conditions in full. The first of these repositories—established in 1984—is the Universities’ Research Repository South Australia (URRSA), which serves a consortium consisting of the University of Adelaide, Flinders University and the University of South Australia. URRSA simply stores material on behalf of participating libraries (Baudinette 1999). There is no transfer of ownership or attempt to de-duplicate the store, and no onus on participating libraries to retain material indefinitely or to support access with high-end technologies.

The second—and most high profile—Australian repository, is the CARM Centre managed by CAVAL Collaborative Solutions. CARM is located in outer-Melbourne on land owned by La Trobe University. The CARM store has been operational since 1997, providing storage services to member libraries, which currently consist of academic libraries from Victoria plus the Universities of New South Wales, Western Sydney and Tasmania. CARM has a capacity of approximately one million volumes, with planning underway that will double the current space. CARM is closer than URRSA to the fully implemented repository model in that libraries may choose to cede ownership to the ‘CARM Collection’ in its role as a last copy repository. As at April 2008 the CARM Collection included 246,391 non-serial titles, and approximately 300,000 volumes of serials. The facility is, however, also used for print storage by libraries that lease space for the purpose and retain ownership of the stored material. The decision by libraries to retain ownership of stored material is likely to be based on;

- the belief that items may at some future time be reincorporated with the main collection if priorities change or more space becomes available;
- institutional accounting practices which prevent the transfer of ownership;
- a competitive desire to retain a high count of ‘owned’ titles and volumes.

With the CARM Store providing the only facility for transferred ownership, it was therefore decided to attempt to estimate the space that member libraries could save if they were to cede ownership of low use books to CARM as a precursor to de-duplication. Books were chosen as the focus of the study for several reasons. Firstly, the task of estimating the space implications of book duplication is more achievable than with journals where the amount of space consumed by titles cannot be estimated on the basis of holdings records only. And secondly, the rapidly expanding availability of journal backsets in secure digital form means that the ‘International approach’ is less contentious for this material. The decline of the scholarly journal in print form is irreversible, and the technologies of article discovery and delivery have to a large extent already been ‘internationalised’. The situation with books and other monographs is far less clear. After a period of decline in the 1990s the rate of acquisition of print books by Australia’s academic libraries has recovered to near record highs, and this trend appears likely to continue (Genoni 2008).

It was therefore decided to undertake a study of monographs that met the following criteria:

- Dewey class no. in the 600s;
- published prior to 1990;
- owned by one or more of the CARM member libraries.

The Dewey 600s—which include technology, medicine, engineering, agriculture, management, and building and construction—were chosen as it was known that the largest of the CARM member libraries (La Trobe, Melbourne and Monash) have substantial holding in these subjects. As the purpose of the study was to assess the potential for de-duplication it was also believed that these subject areas included material that would date more rapidly than some others and would therefore be available to be relegated to storage or withdrawn from collections. It is also the case that the nature of the subjects included in the 600s would invariably mean that many items would be published overseas and therefore not include a high percentage of material for which the NLA and state libraries had responsibility for ensuring permanent retention (as might, for example, the 800s or 900s). It is not suggested that results from a study based on the 600s would *necessarily* be duplicated in other classes.

The overlap study was undertaken for two categories of material. Firstly, for records that included a holding for the CARM Collection. That is, a copy of the item has already been ceded to the CARM Collection for permanent retention. Secondly, for records held by at least one member library but for which there is no current holding in the CARM collection.

The data was provided by the National Library of Australia and based on a search of the *Libraries Australia* database undertaken in April 2007. *Libraries Australia* is the most comprehensive data source available but it is by no means without problems. As previous studies have found it is likely to be prone to some degree of error. The principle causes of error are; duplication of records for the same item; incomplete holdings; failure by libraries to amend records to reflect the current status of an item.

Overlap for items included in the CARM Collection

The CARM Collection consists of items for which ownership has been transferred from a member library to CARM. The collection has been de-duplicated, so that only one copy of any item is retained. The overlap for items amongst member libraries was firstly calculated for items held in the CARM Collection, with a Dewey 600 class number and pre-1990 publication. There are currently 22,408 titles in the CARM Collection matching these criteria.

Tab.1: Duplication of CARM Collection monographs

No. records	No. holdings	%
7,954	CARM only	35.50
5,209	CARM + 1	23.25
3,527	+ 2	15.74
2,436	+ 3	10.87
1,550	+ 4	6.92
898	+ 5	4.01
504	+ 6	2.25
217	+ 7	0.97

79	+ 8	0.35
30	+ 9	0.13
3	+ 10	0.01
1	+ 11	0.00
22,408	58,157	

The 22,408 records have an average of 2.6 holdings per record, and the total number of duplicate holdings held by CARM member libraries is 35,749.

Overlap for items not included in the CARM Collection

The overlap for items (Dewey 600s, pre-1990 publication) was also calculated for items not held in the CARM Collection, but owned by one or more member libraries.

Tab.2: Duplication of non-CARM Collection monographs

No. records	No. holdings	%
139,638	1	62.26 ⁴
38,911	2	17.35
19,681	3	8.77
11,453	4	5.11
6,679	5	2.98
3,938	6	1.76
2,134	7	0.95
1,053	8	0.47
510	9	0.23
231	10	0.10
59	11	0.03
1	12	0.00
224,288	410,261	

The 224,288 records have an average of 1.83 holdings per record, and the total number of duplicate holdings is 185,973.

In total there are 246,696 records with the Dewey class 600; published before 1990, and owned by CARM or a CARM member library. This 'system' of libraries is recorded as having 221,722 duplicates for these titles.

These figures do not of course allow a precise calculation of the amount of space that could be saved in practice. They do, however, help establish the extent of the *potential* saving under different scenarios. For example, in the extreme case, member libraries could as a matter of policy choose to deposit one copy of each title in the study sample (Dewey 600s, pre-1990 publication) with the CARM Collection and divest all duplicate copies. This would add 224,288 titles to the CARM Collection, while leading to a

⁴ The reliability of this figure is supported by the NLA study. This figure of 62.26% unique holdings is derived from eleven academic libraries, 9 from Victoria and 2 from New South Wales. The NLA study (covering all Australian academic libraries and all Dewey classes), produced figures of 57.04% for Victoria and 63.04% for New South Wales (Missingham & Walls 2003, p. 253).

reduction of 446,010 (35,749 + 410,261) titles shelved by the member libraries. Table 3 calculates the *approximate* amount of shelving space that could be retrieved by such a strategy.

Calculating space required for library storage is a task bedevilled by numerous variables (Leighton & Weber 1999), and there are a number of recommended formulae. The following calculations are based on 1.2 volumes per title (record), shelved at 30 volumes per linear metre (National Library of Australia 2004).

Tab. 3: Potential reduction in shelving: CARM members

No. items	No. volumes	Shelving (linear metres)
446,010	535,212	17,840

It is not of course suggested that this ‘saving’ of nearly 18 kilometres of shelving is an immediately achievable outcome. Libraries will need to retain some of this material, and even if this reduction were feasible Australia does not at present have a repository of sufficient scale to receive the projected number of transferred volumes (224,288 records = 269,145 volumes).

Other relevant figures for the extrapolation of this data relate to the floorspace needed to house the material. A recent estimate (O’Connor 2005, p. 22) is that conventional library storage requires houses 145 volumes per square metre, as compared to high-density repository storage of 373 volumes per square metre. The saving in library floorspace would therefore amount to some 3691m², which would be replaced by 1434m² of repository floorspace. This already substantial saving is magnified by the significantly higher cost—estimated at ‘a factor of five or six times’ (O’Connor 2005, p. 22)—of building and maintaining conventional library space as opposed to repository space.

‘Three library’ study

Three libraries were selected for a study of overlap between a subset of the CAVAL member libraries. La Trobe, Melbourne and Monash were chosen on the basis that they represented the three largest of the Melbourne based libraries, and all three were known to have good-to-strong holdings in the 600s. Again this data covers the Dewey 600s, with publication prior to 1990.

Tab. 4: Unique holdings

La Trobe	10,092	9.7%
Melbourne	24,170	23.3%
Monash	7,907	7.6%
	42,169	40.6%

Tab. 5: Held by two libraries

La Trobe & Melbourne	18,605	18.0%
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La Trobe & Monash	15,864	15.3%
Melbourne & Monash	18,328	17.7%
	52,797	51.0%

Tab. 6: Held by three libraries

La Trobe, Melbourne & Monash	8,669	8.4%
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There was a total of 103,635 records for the three libraries, with 70,135 duplicate holdings, for an average of 1.68 holdings per record.

These figures indicate the extent of duplication of low use material (see lending data reported below) between libraries located within the same metropolitan area and teaching in the same broad areas.⁵ Nearly 60% of titles are held in two or more copies, and over 40% of shelf space is consumed by duplicate holdings. It is again possible to calculate the effect of the extreme case (depositing single copies with the CARM Collection and removing duplicates) by which the libraries would divest 173,770 titles.

Tab. 7: Potential reduction in shelving: La Trobe, Melbourne & Monash

No. items	No. volumes	Shelving (linear metres)
173,770	208,524	6,951

In order to assess something of the impact on local users of such a response (and thereby saving the libraries a total of nearly seven kilometres of shelving) it is necessary to attempt to assess the local demand for this material. In this case the number of volumes would require approximately 1,438m² of library floorspace, or 559m² in a repository.

Local demand (lending) for Dewey 600s, pre-1990

In order to assess the level of local demand for items that might potentially be deposited or discarded, lending figures for the full year 2007 were obtained from La Trobe, Melbourne and Monash. These figures were again for the Dewey 600s, both for pre-1990 publications, and for publications from 1990 and after.⁶

Tab. 8: Lending, Dewey 600s, pre-1990 monographs

	Items	No. items loaned (% of items)	No. loans (% of all loans)
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⁵ The figure of 40.6% unique holdings can be compared to the result achieved by three North American universities (Duke, North Carolina State University and the University of North Carolina) that comprise the Triangle Research Libraries Network (TRLN). A 2006 study of overlap between the libraries (across all classifications) found that 70% of holdings were unique (Triangle Research Libraries Network 2006). This much 'better' result for the TRLN libraries is the outcome of a long established program of cooperative collecting (Dominguez & Swindler 1993).

⁶ Note that as the lending data is derived from local systems, the same source has been used for the number of items available for loan. For all three libraries this *exceeds* the number of items listed in *Libraries Australia* and used elsewhere in this paper. The explanation for most of this discrepancy appears to be that whereas the *Libraries Australia* data has been able to be limited to books (and is thereby more suitable for calculating space savings), the local systems include books and other non-serial items.

La Trobe	106,987	11,597 (0.11)	16,961 (14.2)
Melbourne	86,937		21,897 (11.6)
Monash	117,826	13,980 (0.12)	19,979 (8.9)
	311,750		58,837 (11.05)

Tab. 9: Lending, Dewey 600s, 1990+ monographs

	Items	No. items loaned (% of items)	No. loans (% of all loans)
La Trobe	85,647	29,951 (0.35)	102,443 (85.8)
Melbourne	71,869		167,295 (88.4)
Monash	116,018	65,822 (0.57)	204,049 (91.1)
	273,534		473,787 (88.95)

As would be expected these figures indicate a significant decline in demand for ‘older’ material. Across the three universities 88.95% of the borrowing is accounted for by the material published in 1990 or later, and only 11.05% by the material published earlier. For the two libraries for which a figure is available, only just over 10% of individual items published prior to 1990 were borrowed within the 12 months.

These results indicate that it is likely that for each of the universities a significant amount of the pre-1990 material will not be borrowed, even over an extended period. It is also likely that even this current modest level of borrowing of pre-1990 publications will decline further as the material continues to date.

There is, nonetheless, residual demand for older material, although it is unclear if this demand is item specific, or if borrowers are simply selecting ‘something’ that appears to be on topic and are perhaps unaware of the year of publication of their chosen text. And if demand is item specific, it is unclear if this needs to be met immediately or if users would be prepared to wait a short period for delivery from a repository source. These matters would require further investigation before a more sophisticated assessment could be made of the likely impact of transferring older material to a repository collection such as CARM.

DISCUSSION AND CONCLUSION

The research reported in this paper is indicative only, and needs to be read in the context of other available evidence. As discussed, the primary data source, *Libraries Australia*, although the best available, is by no means completely accurate. There have also been some decisions made in gathering the data—for example, the choice of the Dewey 600s, and the selection of 1990 as a ‘cut off’ date—which mean that the outcomes would vary if other parameters were substituted. Nevertheless, the results of the study are defensible in terms of the goal of producing evidence that could inform decisions regarding the establishment of a national print repository.

What the data in this paper indicates is that there is considerable scope for a reduction in local, duplicated, high-cost storage. It is apparent that the scope for space savings for individual libraries is important, and that when extrapolated across a system these savings are potentially substantial. In the short term this can produce a benefit by releasing space currently used for print storage for other uses, but over the longer term it

translates into a real financial saving for institutions as they defer the need for new or expanded buildings and reduce their outlay on print storage.

The extent to which Australian academic libraries are already (and increasingly) relying upon withdrawal of non-serial material to manage space problems has recently been reported (Genoni 2008). While this withdrawal is necessary for local collection management, it is proceeding with little consideration for developing the form of print storage that is necessary to either reduce the cost burden on research institutions, or to optimise the discovery and delivery of this material for the benefit of the country's research community. Currently the management of Australia's legacy print collections is proceeding in something of a policy vacuum, with seemingly little desire to tackle the issues around long-term management.

Managers of Australia's research infrastructure are actively promoting the use of collaborative, cross-institutional management of the nation's research assets. As the National Collaborative Research Infrastructure Strategy Committee (NCRIS) (2008) recently concluded, 'Major infrastructure should be developed on a collaborative, national, non-exclusive basis' (p.52). The drivers in the implementation of research infrastructure are both cost and benefit, with national collaboration seen as favourable to both sides of the equation. The challenge for Australia's academic and other research libraries is to ensure that national initiatives are not confined to e-research infrastructure only, and that they continue to promote the national importance and research value of their legacy print collections.

As indicated in the introductory sections of this paper, federated repositories based on ceded ownership are increasingly being used internationally as the preferred means of managing the long-term storage of print journals and monographs. Despite the implementation and gradual development of the CARM Collection, Australia is beginning to look 'out-of-step' with countries that are more actively developing print repository collections and services. The explanation for this might be found in the ARLCAP Report and its dual scenarios of the 'Nationalist approach' and the 'Internationalist approach'. It may be that Australia's academic libraries, having failed to build an independent research capacity or to reach agreement on the need for a national approach to print storage, have *de facto* accepted that their future lies in adopting the 'Internationalist approach'. Since the ARLCAP Report was concluded, the advent of mass digitisation programs for print monographs (most notably—but not only—Google Print), has given further impetus to the Internationalist approach; perhaps convincing those in doubt that digital technologies will render the e-book as ubiquitous as the e-journal.

If it is the case that Australia's research libraries have decided to adopt the Internationalist approach, then this should be made clear to the relevant research bodies and government departments. If, however, they believe it is in the national interest that Australian research should be as autonomous as possible and that the book is unlikely to ever have the same amenity with regard to digital use as the journal, then they should ensure that legacy book collections are stored as cost-effectively, securely, and accessibly as possible. This will be achieved when there is minimisation of system-wide costs associated with long-term storage; certainty about the retention of individual titles; and state-of-the-art support for digital discovery and delivery of legacy print collections.

These benefits are likely to be achieved only in a collaborative storage environment built around a fully implemented national repository.

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