

# The Library Consortium of New Zealand's Shared IRR Infrastructure

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The Library Consortium of New Zealand has run an Institutional Research Repository Project for three universities and one institute of technology in New Zealand since 2006. After a brief introduction to the context in which the project operates, this document describes the Institutional Research Repositories that are part of this project and their shared infrastructure. Particular emphasis is placed on advantages and challenges created by the shared infrastructure.

## 1. Context and history

New Zealand with its population of about 4 million people has eight universities and about 20 institutes of technology. Most New Zealand universities have around 15,000-30,000 students (full-time equivalent, 2010) and around 500-2,000 members of academic staff (full-time equivalent, 2010).

In 2001, the libraries at AUT University, the University of Otago, the University of Waikato and Victoria University of Wellington started an initiative to purchase and jointly operate a library management system [1]. In 2004, the Library Consortium of New Zealand (LCoNZ) was incorporated and took over this initiative, with the four universities as shareholders.

Today, the organisational structure of LCoNZ comprises the Board, a part-time General Manager appointed by the board and the Senior Management Group. The LCoNZ Board consists of an independent chairperson and four Directors, each of whom are representatives of a shareholder university, together with up to three independent directors. The Senior Management Group (SMG) provides advice and strategic direction to further the collaborative work of LCoNZ. It consists of up to two representatives from each of the shareholding university libraries and one representative from the university IT Directors.

## 2. The LCoNZ IRR project

LCoNZ started the Institutional Research Repository project in 2006 [6]. After investigation of technical alternatives, it was decided to use DSpace as the platform. The contract to develop and host Institutional Research Repositories (IRRs) was awarded to the Information Technology Services (ITS) division at the University of Waikato. IRRs were initially to be set up for AUT and the University of Waikato, with the University of Otago to follow [2]. Victoria University participated in the investigation period but then decided to host their own repository rather than participate in the LCoNZ IRR project [6].

The LCoNZ IRR project is overseen by an Operations group in addition to the LCoNZ board, manager and SMG. The Operations group consists of Library staff members at the sites who are directly concerned with the repositories, the LCoNZ manager and staff from Waikato ITS. The Operations group meets once a month in a conference call, with an annual face-to-face meeting for roadmap planning. The Victoria University repository manager is typically on the conference calls as well, albeit in a listening role.

### 2.1. The LCoNZ Repositories

The University of Waikato's IRR, Research Commons<sup>1</sup>, was established in early 2007 using Digital Commons as a temporary solution [5]. Research Commons was re-launched using DSpace at the end of March 2008. Since Waikato University theses were already made available through the Australasian Digital Theses (ADT) project at the time, Research Commons originally hosted only other forms of scholarly output. ADT was decommissioned in 2010; all Waikato University theses from ADT were migrated into Research Commons and Research Commons started to accept thesis deposits. Deposit of Higher Degree Theses and Masters Theses is mandated, with deposits made by the students. Most non-thesis items in Research Commons are deposited by library staff members. Research Commons is supported by a full-time Repository Manager and an assistant.

AUT's IRR, Scholarly Commons<sup>2</sup>, had initially been established in 2006, also using Digital Commons [4]. Scholarly Commons was re-launched using DSpace in April 2008. It originally contained only theses; from April 2009,

<sup>1</sup> <http://researchcommons.waikato.ac.nz>

<sup>2</sup> <http://aut.researchgateway.ac.nz>

other types of scholarly publications were added. Scholarly Commons is committed to host only records that are publicly available in full text. Self-deposit of theses and dissertations is mandated for students at Doctoral and Masters level. In 2011, AUT's research office implemented Symplectic Elements, which connects to Scholarly Commons using Repository Tools. All non-thesis items in Scholarly Commons now come in via Symplectic Elements. Scholarly Commons is supported by a full-time Repository Administrator and some involvement of the Digital Services Coordinator.

The University of Otago's IRR, OUR Archive<sup>1</sup>, was launched in August 2009 [3]. The contents originally were mainly theses. In 2011, all 1,000 records from an EPrints repository run by Otago University's School of Business were migrated into OUR Archive. The School of Business EPrints repository had been established in 2005 as New Zealand's first publicly accessible research repository [7]. Self-deposit of PhD Theses and Research level Masters Theses is mandated. Academics are encouraged to self-deposit other types of research outputs. The Digital Initiatives Librarian plans future developments for OUR Archive. Information Resources staff are responsible for administration of deposits to the repository.

LCoNZ acquired Unitec Institute of Technology as a client for the IRR project in 2009 [3]. Unitec's IRR, Research Bank<sup>2</sup>, went live using DSpace in May 2010. All items in Research Bank are deposited by library staff members. The Unitec Research Bank superseded Unitec's previous institutional repository, Coda, which had operated as part of a consortium with other institutes of technology and polytechnics, using Digital Commons software. Research Bank is supported by a part-time Repository Administrator.

	AUT	Otago	Unitec	Waikato
Public records 15 Feb '12	1,866	1,768	468	5,139
Records with open access full text 15 Feb '12	100%	64%	95%	65%
Theses and dissertations 15 Feb '12	59%	61%	56%	21%
Unique visitors 6-12 Feb '12 (Google Analytics)	1,750	1,688	450	3,172
Full text downloads 6-12 Feb '12 (DSpace)	8,977	4,432	2,002	7,775

Table 1: Repository statistics mid-February 2012

## 2.2. Shared IRR infrastructure

Waikato University ITS employ one full-time software developer who is dedicated to the LCoNZ IRR project as the LCoNZ IRR Technical Specialist. Additionally, Waikato ITS provides project management for the project. Some tasks related to the repositories are shared between the LCoNZ IRR Technical Specialist and other staff at Waikato ITS whose expertise is in systems administration, network support and related fields.

The LCoNZ IRR project uses nine servers – one production server and one test server dedicated to each site and an additional test server for AUT's integration with Symplectic Elements. All servers are virtualised and reside in the Waikato ITS VMWare clusters.

With a DSpace upgrade at the end of 2011, one emphasis was on consolidating server configuration and code-base. All servers now run DSpace 1.7.2 with XMLUI and a Mirage-based theme, supported by Red Hat Enterprise Linux 6, PostgreSQL 8.4, Apache 2.2 and Tomcat 6. All servers except those for Unitec run a custom thesis deposit form written in PHP that connects to DSpace via its SWORD interface. Puppet is used to streamline some configuration. A private GitHub repository is used for source code management and version control.

Waikato University ITS provides an issue tracker for use by the LCoNZ IRR project. All Operations group members and other relevant stakeholders from the sites have access to all issues related to this project. Much of the communication between the LCoNZ IRR Technical Specialist and the site contacts is done via the issue tracker, supported by e-mail, the occasional telephone call and web-based collaboration tools.

## 3. Advantages, challenges and differences

True to the old cliché of the whole being more than the sum of its parts, we believe that the LCoNZ shared infrastructure model has many advantages for our IRRs, our libraries and our institutions. However, the model also comes with a few challenges. Both are described in this section, as are some specific differences in our IRRs that are consequences of our participation in the LCoNZ IRR project.

### Advantages

**Everybody gets to do what they know best.** Technical tasks related to the hosting and maintenance of the repositories are passed on to the IRR Technical Specialist. This arrangement frees up the repository managers and other library staff at the sites to concentrate on their core business, such as content recruitment, quality assur-

<sup>1</sup> <http://otago.ourarchive.ac.nz>

<sup>2</sup> <http://unitec.researchbank.ac.nz>

ance, promotion of the repository and service development. Conversely, the IRR Technical Specialist, as a software developer, can leave content-related tasks to those deeply familiar with libraries.

**Local knowledge and skills are shared.** Regular collaboration within LCoNZ and in particular in the Operations group means that local knowledge about our repositories, about our processes and also about IRRs in general is made explicit and shared amongst the Operations group members. Sharing knowledge within the Operations group automatically improves the spread of this knowledge at each site. Certainly each site has its own policies for documentation and knowledge sharing, but we find that the collaborative work can provide the small additional impetus that is sometimes needed to make policies work in practice. For Victoria University, the biggest advantage of being at least somewhat involved with the LCoNZ IRR project is that they have a formal community to refer back to, including a developer actively working on DSpace who their technical staff can liaise with if necessary. Participating in the Operations group meetings gives them an opportunity to see what other IRRs in New Zealand are currently developing and to learn about issues faced by other libraries.

**Local risk is spread out.** Sharing knowledge and skills also helps manage risk. Most work related to each of our IRRs hinges on a single person at that site. The LCoNZ model means that other people in similar positions can help bridge gaps in knowledge when a staff member is on leave or a position is vacant.

**Local improvements can be shared.** Configuration changes, bugfixes and new features are often applicable to several of our IRRs. The LCoNZ model, with one person directly in charge of the entire codebase, facilitates sharing these across sites. Customisations and expertise can also be shared with the wider DSpace community; for example, both the current and the previous LCoNZ IRR Technical Specialists are active DSpace committers.

**Local influence is shared.** From a global perspective, New Zealand itself and our repositories in particular are relatively small. By banding together, we are able to participate much more fully in the IRR community both within Australasia and internationally.

**Local costs are shared.** Sharing the costs for running the repositories in practice means that we cannot just afford to run an IRR at each institution, but that we can afford to run them well. Combining the IRR budget of four institutions sometimes means that we can jointly afford expenditures that would be out of reach for one individual institution. For example, there has been an LCoNZ delegate at every Open Repositories conference since 2009. Obviously, four institutions jointly can send one person, whereas it is not possible to send  $\frac{1}{4}$  person from four institutions each. The LCoNZ IRR model also allows joint purchases of software licenses, cloud services, such as the private GitHub repository and advanced analytics packages – often the cheapest plan is still generous enough to cover the needs of all four repositories.

## Challenges

**Making the most of the opportunities.** Some of the advantages described in the previous section are opportunities rather than guarantees; they have the potential to be beneficial but are so in practice only when we make use of them. To follow the Open Repositories example above, it may not be possible to send  $\frac{1}{4}$  person from each institution each year, but it would be possible for each institution to send one person every four years – but not if that money is spent on sending the LCoNZ delegate, almost always the IRR Technical Specialist. The implication is that other IRR staff miss out on this opportunity to participate more fully in the international community. We also find that much communication is between the IRR Technical Specialist and an individual site; it is much rarer for two sites to communicate directly. The emphasis in the Operations group meetings is typically directly on developing for our IRRs, with much less exchange about “soft” issues around the IRRs such as promotion and education, staff workflows or metadata usage. This emphasis also means that representatives from Victoria University cannot fully participate in the Operations group meetings.

**Differences across the sites.** There are considerable differences across the members of the LCoNZ IRR project at repository, library and institutional levels. Examples are the focus and mission statement of the IRR, staffing arrangements (time allocation and roles), processes, which other parts of the institution are connected with the IRR and in what way, as well as the technical infrastructure and even some public holidays. Quite naturally, these differences impact on the priorities at the sites and require some flexibility in DSpace customisations. This challenge is exacerbated when an issue at one of the sites is confidential and cannot be discussed openly in the whole group. Some differences can also have more practical implications, for example when quiet times of the year (good candidates for software upgrades or to focus on major new developments) do not coincide.

**Agreeing on a direction and on priorities.** The many differences in the LCoNZ IRR project inevitably lead to differences in priorities and direction for the IRRs. The implications are two-fold: more of our time goes towards finding a common direction and common priorities than most likely would be required by a single institution, and sometimes we have to compromise on features that are locally important in favour of things of importance to other sites. For Victoria University, being able to control the development and timelines independent of any other institutions is seen as a main advantage of not participating in the LCoNZ IRR project. We have recently begun to experiment with Agile software development techniques to help us with this aspect.

**Communication.** Any umbrella organisation brings with it some delays – real or perceived – that arise from having to balance the needs of and coordinate the work for all involved. Our IRR project is geographically spread out across New Zealand, which gives us very few opportunities for face-to-face communication. Transparency can also be an issue with so many different parties involved. Even given everyone's best intentions to keep information flowing between the repository managers at the sites, this can be difficult given the many people, roles and sites involved.

### 3.1. Specific differences

We believe that the LCoNZ IRR model creates some specific differences in our IRRs and the way they are run compared to the most likely alternatives. Each site might host their own repository. In this case, we believe:

- Our repositories would be much less customised and any customisations might be limited to the user interface layer. We might not have the dedicated thesis deposit form.
- Some aspects of DSpace that require configuration settings (such as exposing metadata for harvesting or excluding crawlers from usage statistics) might be done less well without deep in-house DSpace expertise. With less capacity available for technical support, we might still be running a much older DSpace version.
- The staff roles around the IRR would most likely be quite different. Either the repository manager roles might be more technical, or the Libraries would have had to fund time within their own IT departments. With time and/or funds tied up in this way, the workload for supporting the IRR (such as processing deposits) would most likely be spread around the Subject Librarians a lot more.

For Unitec, creating a repository using only their own resources would simply not have been possible.

Another option would be for each site to have their own repository hosted by a different outside provider. In this case, we believe:

- We would most likely have much less influence with regards to DSpace upgrades and customisations, both for scope and scheduling. It is likely that we would not have been able to afford separately to pay for the customisations that we achieved together.
- We would not be part of a community to the same extent and consequently would lose many of the advantages described above.

## 4. Conclusion

We believe that the consortium model works very well for running our Institutional Research Repositories, with the benefits far outweighing the inevitable challenges of cross-institutional collaboration. Our advice to anyone setting up an IRR for an institution similar to those in the LCoNZ IRR project is to evaluate carefully whether the technical resources and infrastructure can be shared with others. In our experience, people in charge of IRRs at institutions like ours are often Librarians with a little bit of technical background who then struggle along; often, they do not have the funding, time or skills to do a really great job. Compared to the alternative, an IRR hosted by an external provider, our model offers among other benefits increased control over functionality of the IRRs and the benefits of being part of a like-minded community.

## Acknowledgements

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